Spatial Productivity Differences and Government Rent-Seeking

Sitian Liu* Yichen Su†

May 6, 2025

Abstract

Using a spatial equilibrium model, we show that higher local productivity enables rent-seeking governments to extract more taxes by reducing residents' out-migration response to local tax hikes. Such rent-seeking tax policies can discourage workers from choosing high-productivity locations, reducing the national output. Guided by the model's predictions, we provide empirical evidence of government rent-seeking, showing that tax rates and the public-private wage gap tend to be higher in more productive cities and states. To distinguish rent-seeking from alternative mechanisms, we exploit variation in public-sector collective bargaining laws across states and differences in local governments' reliance on state transfers.

Keywords: Rent-Seeking, Rent-Extraction, Leviathan, Public Sector, Government, Public-Private Wage Gap, Spatial Dispersion, Productivity, Migration, Tax, Union, Misallocation, Efficiency

JEL Codes: H71, H72, J24, J31, J45, R23, R51

*Department of Economics, Queen's University. Email: sitian.liu@queensu.ca.

†Department of Economics, Southern Methodist University. Email: yichensu@outlook.com. We thank Nathaniel Baum-Snow, William Strange, seminar participants at Queen's University and the University of Toronto, and participants at the Urban Economics Association and the Southern Economic Association meetings for their valuable comments and suggestions.

1 Introduction

While many public finance models assume that local governments act as benevolent social planners, Brennan and Buchanan (1980) consider the possibility of rent-seeking governments, who aim to maximize net tax revenue from taxpayers. They emphasize that this rent-seeking behavior can be curtailed by taxpayers' ability to "vote with their feet." In other words, taxpayers can migrate to other jurisdictions if taxes become too high and public goods provision is insufficient.

However, several factors could weaken the disciplining force of taxpayer mobility, such as migration frictions, desirable local amenities (e.g., sunshine and beaches) and inelastic housing supply (Brueckner and Neumark, 2014; Diamond, 2017). In such cases, reduced migration responses to tax increases may allow rent-seeking government to raise taxes without corresponding improvements in public goods.

In this paper, we propose and empirically test the hypothesis that high local productivity enables rent-seeking governments to extract additional rents. Intuitively, spatial productivity differences across the US increase the desirability of certain locations, thereby reducing local residents' incentives to relocate. This diminished mobility response could allow state and local governments in high-productivity locations to impose heavier tax burdens and extract more rents.

The hypothesis is motivated by an observation that tax rates vary widely across US states and are highly correlated with state productivity, approximated by the private-sector wage residual. Figure 1a presents a binned scatter plot of the relationship between the per capita tax-to-income ratio and the state-level log wage residual, suggesting a strong positive correlation between the tax burden experienced by residents of a state and the state's productivity. Figure 1b shows that the relationship remains robust after accounting for local natural amenities, political preferences, land restrictions, and potential intergovernmental competition.[1]

To illustrate the mechanism behind government rent-seeking, we present a spatial equilibrium model in which state and local governments maximize net tax revenue rather than the utility of residents. Workers, who are imperfectly mobile, choose locations based on after-tax wages, housing rents, amenities, public goods, and their idiosyncratic preferences. The model shows that a government's ability to extract rents depends on the migration elasticity of local residents with respect to tax rates. High migration elasticity constrains

[1] The per capita tax-to-income ratio is computed as state and local government tax revenues per capita divided by the average total income of private-sector workers in each state, using tax revenue data from the Annual Survey of State and Local Government Finances for 1987, 1998, 2007, and 2017. Wage residuals are estimated using the Current Population Survey separately for each period, controlling for age, race, Hispanic origin, sex, marital status, education, industry, and occupation. Both figures control for years fixed effects, and Figure 1b additionally controls for college share, natural amenities, political preferences, land unavailability, and the number of counties within each state (as a proxy for competition between local governments).

governments from rent extraction and therefore they behave more like benevolent governments. However, local productivity premiums can reduce migration elasticity, allowing governments to raise taxes without increasing the provision of public goods.

Using the model, we show that government rent-seeking policies facilitated by local productivity premiums can reduce national welfare and economic output due to labor misallocation. Specifically, workers may be less inclined to choose highly productive locations because of elevated taxes, compared to scenarios without government rent-seeking motives.[2]

From the model, we derive four empirical predictions to test for government rent-seeking: (1) Tax rates should be higher in more productive locations. (2) The public-private wage gap should be larger in more productive locations. (3) This relationship should be stronger in locations where government workers can bargain collectively. (4) The wage gap between local government workers and private-sector workers should also depend on *state* productivity, especially if local governments rely heavily on state transfers.

Next, we empirically test these predictions. We use two measures of local productivity. First, we estimate log wage residuals of private-sector workers across states or metropolitan statistical areas (MSAs) from the Current Population Survey (CPS), controlling for observable worker characteristics. However, this measure may reflect the sorting of workers based on unobserved worker characteristics. Thus, we also use location premiums from Card et al. (2025), which account for unobserved sorting and capture the *causal* effect of location on earnings. We find that the two measures are strongly correlated and the findings based on these measures are highly consistent.

To test our first prediction, we combine the productivity measures with government revenue data from the Annual Survey of State and Local Government Finances. Our results indicate that tax rates (per capita tax revenue divided by average income) are higher in more productive jurisdictions at both the state and county levels. The proxies for public goods—road quality, healthcare resources, school quality, public safety, and fire department performance—do not show a significant positive correlation with local productivity after controlling for local factors. These findings suggest that residents in more productive areas tend to face higher tax rates, but the additional tax revenue has not been fully allocated toward improving public goods.

However, alternative explanations could drive this positive relationship between tax rates and productivity. Workers in more productive locations may have stronger preferences for public goods. Another possibility is the Baumol effect: If public-sector productivity is identical everywhere and the demand for public goods is

[2] Prior research shows that spatial disparities in tax rates encourage workers to leave high-tax locations (Moretti and Wilson, 2017; Fajgelbaum et al., 2019).

income-elastic but highly price-inelastic, in locations with high private-sector productivity, the high private-sector productivity could lead to high local public goods prices (Baumol, 1967). Under these alternative mechanisms, tax rates could be higher in more productive locations without government rent-seeking.

To distinguish government rent-seeking from these alternative explanations, we examine spatial variations in the public-private wage gap (our second prediction). Using CPS data, we show that a 1% increase in the state wage premium corresponds to a 0.4% increase in the hourly wage of state government workers relative to private-sector workers. Similarly, a 1% increase in the MSA wage premium correlates with 0.2% higher wages for local government workers compared to their private-sector counterparts. The results remain consistent when we use the productivity measure of Card et al. (2025). The findings support our rent-seeking hypothesis, indicating that the additional tax revenue collected in high-productivity locations is likely to have been partly transferred to public-sector workers, rather than being driven solely by differences in public goods demand.

However, this observed positive relationship between the public-private wage gap and local productivity could still be driven by the Baumol effect if labor mobility between the public and private sectors is imperfect. To further distinguish rent-seeking from the Baumol effect, we test our third prediction by analyzing state-level variations in collective bargaining laws. In states where public-sector collective bargaining is allowed, government workers face lower barriers to pressuring governments for higher compensations (Brueckner and Neumark, 2014; Diamond, 2016). Consistently, we find a stronger positive relationship between local productivity and the public-private wage gap in states with collective bargaining. This heterogeneity by collective bargaining laws further shows that our conclusion is robust to the Baumol effect, because the Baumol effect arises from the income effect on demand for public goods and thus its impact on the wage gap should not depend on collective bargaining laws.

We then test our fourth prediction by examining differences in local governments' financial autonomy. If the public-private wage gap stems mainly from the Baumol effect, it should depend only on local productivity. However, if government rent-seeking plays a role, the wage gap in less financially independent local governments should also depend on state productivity due to state transfers—state governments may redistribute rents to local governments, increasing compensations for local government workers. Our results confirm this prediction, showing that for local governments where a larger share of revenue comes from state transfers, the wage gap between local government and private-sector workers depends more on state productivity.

In addition to higher wages, government workers' compensation can also improve through more generous pension benefits. We provide further evidence of government rent-seeking by showing that higher state productivity is associated with increased pension benefits and greater government contributions to pension plans.

Lastly, as robustness checks, we show that our results hold after controlling for demographics, natural amenities, land unavailability, and political preferences.[3]

This paper contributes to several strands of literature. First, we add to the literature on government rent-seeking behavior. We build on the seminal work of Niskanen (1968), who examine budget-maximizing bureaucrats, and Brennan and Buchanan (1980), who propose the "Leviathan Hypothesis" of the public sector. Our paper is most closely related to Brueckner and Neumark (2014) and Diamond (2017), both of which test whether reduced migration elasticity with respect to local taxes enables governments to increase compensation for public-sector workers. We also contribute to studies that examine local migration responses as a key margin of response to tax differences (Haughwout et al., 2004; Duranton et al., 2011; Young and Varner, 2011; Moretti and Wilson, 2017; Akcigit et al., 2021).

More broadly, we contribute to the literature on intergovernmental competition and its implications for local and national economic efficiency (Tiebout, 1956; Bewley, 1981; Wilson, 1986; Zodrow and Mieszkowski, 1986; Hoxby, 1999; Wilson, 1999; Oates, 1999; Brueckner, 2000; Lyytikainen, 2012; Agrawal, 2015; Giroud and Rauh, 2019; Mast, 2020; Agrawal et al., 2022). Our paper highlights government rent-seeking as a potential driver of spatial misallocation of labor, a mechanism similar to the role of land-use restrictions emphasized in Hsieh and Moretti (2019). The aggregate implications of rent-seeking we identify also align with findings from studies on spatial tax disparities (Zidar and Serrato, 2016; Fajgelbaum et al., 2019).[4] However, to be clear, our paper only highlights the role of spatial productivity differences in stunting the disciplining force that restrains local governments from engaging in rent-seeking behaviors. We do not explore the full efficiency implications of intergovernmental competition (e.g., à la Tiebout), which clearly many other papers have done.[5]

Finally, we contribute to the literature on the consequences of spatial disparities in productivity. We highlight government rent-seeking as a potential adverse outcome of such disparities, complementing the im-

[3]This aligns with Ferreira and Gyourko (2009), who find that city government policies do not vary significantly by the political affiliation of incumbents. However, Kahn (2017) presents contrasting evidence in the case of California cities.

[4]Albouy (2009) takes a different approach by examining the heterogeneous tax burden that arises from a uniform federal tax schedule across states with different productivity and cost of living.

[5]In other words, even if local governments are benevolent (maximizing the welfare of local constituents), it is still possible that the national spatial equilibrium is not efficient. But our discussion only focuses on how spatial productivity differences enables government rent-seeking and lowers the efficiency due to local governments' deviation from benevolence.

plications highlighted by the existing literature (Moretti, 2004; Gyourko et al., 2013; Moretti, 2013; Diamond, 2016; Ganong and Shoag, 2017; Giannone, 2019; Eckert et al., 2022).

The rest of the paper is organized as follows: Section 2 presents a spatial equilibrium model with rent-seeking governments. Section 3 describes the data. Section 4 empirically test the model's predictions. Section 5 concludes.

2 Spatial Equilibrium Model with Rent-Seeking Governments

This section presents a model of rent-seeking local governments in a spatial equilibrium. We use this model to demonstrate how taxes and public good provisions set by such rent-seeking governments depend on local migration elasticity and productivity premium.

There are N locations: $j = 1, .., N$. Each local government levies income taxes from workers as a fraction of their wage income and provides local public goods using the taxes it levies. Rent-seeking governments seek to maximize net tax revenue, or "profits," by choosing tax rates and public good provisions. Workers choose locations based on after-tax wages, housing rents, amenities, and public goods provision of each location, but they are imperfectly mobile.

We assume that governments collect taxes as a faction of workers' wage income. However, in reality, a large fraction of local governments' tax revenue comes from property tax. Appendix A2 shows that the model's implications remain the same with property tax. While politics could influence governments' rent-seeking behavior, we abstract away from local political elections in the model, as our focus is on the disciplining force of local migration elasticity.

2.1 Government

The local government of location j collects tax revenue based on a tax rate τ_j and provides local public goods with the cost of g_j per capita to all workers living in j. The government revenue is $\tau_j W_j L_j$ and the expenditure is the cost of providing public goods $g_j L_j$, where W_j is the wage level in location j and L_j is the number of workers in location j. Let $B_j = W_j L_j$, representing the size of the tax base. The local government chooses the tax rate and public goods spending by maximizing its rent (i.e., profit):

$$\max_{\tau_j, g_j} \pi_j = \tau_j B_j - g_j L_j.$$

The first-order conditions (FOCs) are

$$B_j + \tau_j \frac{\partial B_j}{\partial \tau_j} - g_j \frac{\partial L_j}{\partial \tau_j} = 0; \tag{1}$$

$$\tau_j \frac{\partial B_j}{\partial g_j} - L_j - g_j \frac{\partial L_j}{\partial g_j} = 0. \tag{2}$$

Tax Markup Equation 1 can be rewritten as

$$1 + \frac{\partial L_j}{\partial \tau_j} \frac{\tau_j}{L_j} - \frac{g_j}{W_j \tau_j} \frac{\partial L_j}{\partial \tau_j} \frac{\tau_j}{L_j} = 0.$$

To facilitate the analysis, define $s_j = \frac{g_j}{W_j}$, representing per-resident cost of local public goods provision as a fraction of income. We can interpret s_j as the counterpart of τ_j: τ_j is the fraction of workers' income levied by the government while s_j is the fraction of income used to provide public goods. Therefore, the rent extracted by the government can be rewritten as $(\tau_j - s_j)B_j$.

After defining s_j, we can further rewrite the above FOC as follows:

$$1 + \varepsilon_{L,\tau,j} - \frac{s_j}{\tau_j} \varepsilon_{L,\tau,j} = 0,$$

where $\varepsilon_{L,\tau,j}$ is the population elasticity with respect to the tax rate, or the migration elasticity. Rearranging the expression, we have

$$\frac{\tau_j - s_j}{\tau_j} = -\frac{1}{\varepsilon_{L,\tau,j}}, \tag{3}$$

which shows that the rent as a fraction of tax, or tax markup, increases as the migration elasticity decreases. This result mimics the Lerner index, where price markup is the inverse of the price elasticity of demand. The intuition behind the Lerner index is that producers can increase prices above marginal cost if consumers are not sensitive to the price increases. Similarly, in our case, the government can raise tax rates above the cost of providing public goods if local residents are not sensitive to these tax increases.

Spending on Local Public Goods Combining both FOCs, we derive the condition for the allocation of funds on public goods provision:

$$\frac{\partial L_j}{\partial s_j} = -\frac{\partial L_j}{\partial \tau_j}, \tag{4}$$

which means that s_j and τ_j must be set such that the loss in the tax base resulting from an increase in τ_j must be offset by the corresponding increase in s_j.

The government's problem demonstrates that a rent-seeking government's ability to raise taxes depends on the migration elasticity of the local population. We then incorporate additional factors in the model to show how local productivity can reduce migration elasticity, facilitating government rent-seeking.

2.2 Production

There are two types of goods produced in each location: privately tradeable output and local public goods.

Production in the Private Sector All firms in a location j are homogeneous and produce a tradeable output, Y_j, according to the following production function:

$$Y_j = \theta_j L_{j,-g},$$

where $L_{j,-g}$ is the number of private-sector workers in location j. To preserve tractability, we abstract away from modeling capital input.[6] Therefore, θ_j captures both the total factor productivity (TFP) and the capital contribution to the final output. We use the linear production function for simplicity. The simple production specification in this section implies that workers' wage in each location must equal their marginal productivity:

$$W_j = \theta_j.$$

Production of Local Public Goods The public-sector producer produces local public goods, $Y_{j,g}$, according to the following production function:

$$Y_{j,g} = \alpha_j L_{j,g},$$

where α_j is the productivity of the public-goods sector, and $L_{j,g}$ is the number of public-sector workers in location j. Since both the public and private sectors draw from the same local labor pool, public-sector wages must be equal to private-sector wages, given by $W_j = \theta_j$. For now, we assume that public-sector workers cannot bargain for additional compensation and therefore they receive only a rent-free wage. In Section 2.7,

[6] We assume that firms are homogeneous within each location, and abstract from their location choices. If firms (or capital) are perfectly mobile, the capital price equalizes across locations. In this case, the model's predictions remain unchanged because perfectly mobile firms eliminate the possibility of government rent-seeking targeting them. However, if capital is not perfectly mobile, government could extract rents from firms by imposing higher taxes on capital.

we allow for bargaining by public-sector workers.

Since labor is the only input in the production of public goods, the cost of producing one unit of public goods is $\frac{\theta_j}{\alpha_j}$. Given that per-capita spending on local public goods is g_j, the public goods provision per capita in location j is $\frac{g_j \alpha_j}{\theta_j}$.

2.3 Workers

Workers are imperfectly mobile and choose the location that provides the highest utility level. Each worker's utility from living in location j is

$$U_{ij} = \underbrace{w_j + \ln(1-\tau_j) - \beta r_j + a_j + \gamma \ln\left(\frac{g_j \alpha_j}{\theta_j}\right)}_{\bar{U}_j} + \sigma \varepsilon_{ij},$$

where w_j is log wage, r_j is log rent, and a_j is log amenity. β represents the share of housing expenditure. Workers also value the provision of public goods, $\frac{g_j \alpha_j}{\theta_j}$, and $0 < \gamma < 1$ is the intensity of preference for public goods. $\bar{U}_j$ denotes the mean utility of each location. Moreover, each worker has an individual-specific idiosyncratic taste for location j, denoted by ε_{ij}, drawn from a Type-I Extreme Value distribution, and σ is the degree of preference dispersion. Thus, the probability that a worker chooses to live in location j is

$$P_j = \frac{\exp\left(\bar{U}_j/\sigma\right)}{\sum_{j'} \exp\left(\bar{U}_{j'}/\sigma\right)}. \tag{5}$$

The population of location j is $L_j = LP_j$, where L is the total population of the nation.

2.4 Housing Market

The housing supply curve is

$$r_j = r_0 + \frac{1}{\eta_j} \ln L_j,$$

where $\eta_j > 0$ is the housing supply elasticity in location j. A higher η_j means that it is easier for the local housing market to expand in response to an increase in housing demand L_j.

2.5 Migration Elasticity

Now, we derive the migration elasticity with respect to the tax rate and analyze how local factors affect the migration elasticity.

To derive the migration elasticity, we first derive how tax rates affect the local population in equilibrium:

$$\frac{\partial L_j}{\partial \tau_j} = -\frac{L_j (1 - P_j)}{\sigma (1 - \tau_j)} \Lambda_j,$$

where $\Lambda_j = \frac{1}{1+\frac{\beta}{\sigma \eta_j}(1-P_j)}$ is a mitigating factor created by the housing market response. Since $\Lambda_j > 0$, $\frac{\partial L_j}{\partial \tau_j}$ must be strictly less than zero, which means that a higher tax rate will drive down the local population. Thus, the migration elasticity with respect to tax is

$$\varepsilon_{L,\tau,j} = -\frac{(1 - P_j)\, \tau_j}{\sigma (1 - \tau_j)} \Lambda_j.$$

Note that $|\varepsilon_{L,\tau,j}|$ increases with respect to the probability of choosing to live elsewhere $1 - P_j$. This means that if the desirability of location j increases, this will decrease $1 - P_j$, thus decreasing $|\varepsilon_{L,\tau,j}|$.

The migration elasticity decreases with respect to the local housing supply elasticity η_j through the term Λ_j, which is smaller as η_j decreases. This result is consistent with the prediction by Diamond (2017), who analyzes local housing supply elasticity as a mitigating factor for the migration elasticity.

The Effect of Local Productivity Now, we show that higher local productivity reduces the migration elasticity of local residents. First, we derive $\frac{\partial P_j}{\partial \theta_j}$. To do so, we begin by totally differentiating P_j in Equation 5 with respect to θ, accounting for the effects of θ on labor demand and housing rents. We also allow amenity, a_j, to endogenously respond to θ_j. It can be shown that

$$\frac{\partial P_j}{\partial \theta_j} = \frac{\frac{1}{\sigma} P_j (1 - P_j) \left(\frac{1-\gamma}{\theta_j} + \frac{\partial a_j}{\partial \theta_j} \right)}{1 + \frac{\beta}{\sigma \eta_j} (1 - P_j)} > 0.$$

Higher local productivity θ_j increases the probability that workers choose location j, P_j, through two mechanisms: (i) Higher productivity raises local wages, making location j more attractive to workers; (ii) Higher productivity may also improve the level of amenities in j (Diamond, 2016). However, the resulting population increase in j can have an equilibrium effect on rents due to the upward sloping housing supply curve. This effect is captured in the denominator: Locations with a lower housing supply elasticity η_j will experience a stronger rent response, which can mitigate the effect of θ_j on P_j.

After deriving $\frac{\partial P_j}{\partial \theta_j}$, it can be shown that higher local productivity reduces the migration elasticity $|\varepsilon_{L,\tau,j}|$:

$$\frac{\partial \varepsilon_{L,\tau,j}}{\partial \theta_j} = \frac{\frac{1}{\sigma} P_j \left(1 - P_j\right) \left(\frac{1-\gamma}{\theta_j} + \frac{\partial a_j}{\partial \theta_j}\right)}{1 + \frac{\beta}{\sigma \eta_j} \left(1 - P_j\right)} \frac{\tau_j}{\sigma \left(1 - \tau_j\right)} \Lambda_j \frac{\sigma \eta_j}{\sigma \eta_j + \beta (1 - P_j)} > 0.$$

The intuition behind this result is that higher local productivity makes a location relatively more attractive. As a result, the proportion of marginal movers shrinks relative to the total population of the location. This decline in the fraction of marginal movers lowers the migration elasticity of the location. In Appendix A1, we illustrate this intuition using a graphical illustration based on a two-location example.

2.6 Local Public Goods and Taxation in Equilibrium

2.6.1 Rent-Seeking Government

Back to the problem of rent-seeking governments, the equilibrium tax rate and the spending on local public goods can be solved by combining Equations 3 and 4:

$$\tau_j^* = \frac{\varepsilon_{L,\tau,j} \gamma}{1 + \varepsilon_{L,\tau,j} + \varepsilon_{L,\tau,j} \gamma};$$

$$s_j^* = \frac{\varepsilon_{L,\tau,j} \gamma + \gamma}{1 + \varepsilon_{L,\tau,j} + \varepsilon_{L,\tau,j} \gamma}.$$

τ_j^* and s_j^* are functions of migration elasticity and preference for public goods γ. The restrictions of $0 < \tau_j < 1$ and $0 < s_j < 1$ imply that $\varepsilon_{L,\tau,j} < -1$ must hold in equilibrium. If $\varepsilon_{L,\tau,j}$ approaches -1, τ_j would become 1 and the utility would go to $-\infty$, which would increase the migration elasticity $|\varepsilon_{L,\tau,j}|$.

We can see that as the migration elasticity $|\varepsilon_{L,\tau,j}|$ increases, τ_j decreases and s_j increases. Hence, the migration elasticity serves as a disciplining force, preventing tax rates from getting excessively high and ensuring an adequate provision of public goods.

At the one extreme, if $\varepsilon_{L,\tau,j}$ approaches $-\infty$, $\tau_j^* = s_j^* = \frac{\gamma}{1+\gamma}$. The results match the equilibrium under benevolent governments, τ^{benev} and s^{benev}, shown in the next subsection. This indicates that governments are unable to extract any rents from the taxpayers and are compelled to efficiently provide public goods when migration elasticity is very high. At the other extreme, if $\varepsilon_{L,\tau,j}$ approaches the upper bound of -1, $\tau_j^* \to 1$ and $s_j \to 0$, meaning that governments can impose nearly maximum tax rates without allocating any resources to public goods provision.

Since the local productivity premium reduces the local migration elasticity $|\varepsilon_{L,\tau,j}|$, a rent-seeking government in location j tends to impose higher tax rates as the local productivity premium increases,

$$\frac{\partial \tau_j^*(\theta_j)}{\partial \theta_j} > 0,$$

and allocate a smaller fraction of tax revenue towards public goods,

$$\frac{\partial s_j(\theta_j)}{\partial \theta_j} < 0.^7$$

2.6.2 Benevolent Government

To compare our predictions under the rent-seeking assumption, we also examine the behavior of benevolent governments. We assume benevolent local governments set $\tau_j = s_j$, meaning that they extract no rents from the local tax base. Their objective is to maximize the average utility of local residents, $\bar{U}_j$, by choosing τ_j.[8]

We show that under this assumption, tax rates and public goods provision depend only on residents' preferences for public goods (γ) and are unrelated to local productivity (θ_j):

$$\tau_j^{benev} = s_j^{benev} = \frac{\gamma}{1+\gamma} \Rightarrow \frac{\partial \tau_j^{benev}(\theta_j)}{\partial \theta_j} = 0.$$

2.6.3 The Welfare and Economic Costs of Government Rent-Seeking

Lastly, we demonstrate the importance of understanding government rent-seeking by showing that the rent-seeking behavior, enabled by local productivity premiums, can generate welfare and economic costs. To analyze the impact of rent-seeking, we introduce a parameter δ that captures the degree of rent-seeking motives. Specifically, it represents the probability that a state or local government acts as a rent-seeking rather than benevolent government. Thus, governments set tax rates and public goods expenditure according to the following equations:

$$\tau_j(\theta_j) = \delta \tau_j^*(\theta_j) + (1-\delta)\,\tau_j^{benev},$$

$$s_j(\theta_j) = \delta s_j^*(\theta_j) + (1-\delta)\,s_j^{benev}.$$

[7] Although $\frac{\partial s_j(\theta_j)}{\partial \theta_j} < 0$, it is still possible that the absolute spending on public goods g_j is higher in more productive locations.

[8] Note that the assumption of benevolent local governments here does not imply that they necessarily behave like national social planners. They only maximize the welfare of the *local* constituents.

We examine how a marginal increase in δ affects national aggregate welfare and economic output. We start by analyzing the effect of a higher degree of rent-seeking motive (δ) on each location's mean utility $\bar{U}_j$:

$$\frac{\partial \bar{U}_j}{\partial \delta} = \frac{-\frac{\tau_j^*(\theta_j)-\frac{\gamma}{1+\gamma}}{\sigma(1-\tau_j(\theta_j))} - \gamma\frac{\frac{\gamma}{1+\gamma}-s_j^*(\theta_j)}{\sigma s_j(\theta_j)}}{1+\frac{\beta(1-P_j)\Lambda_j}{\sigma\eta_j}},$$

where the numerator captures the direct impact of rent-seeking on local mean utility, while the denominator reflects the mitigating effect of due housing market adjustments.

From this comparative static, we draw two conclusions. First, rent-seeking negatively affects local utility: $\frac{\partial \bar{U}_j}{\partial \delta} < 0$. This is because in all locations, the rent-seeking tax rate satisfies $\tau_j^*(\theta_j) > \tau_j^{benev}$, and the rent-seeking public goods expenditure satisfies $s_j^*(\theta_j) < s_j^{benev}$.

Second, the negative impact of rent-seeking on mean utility is greater in more productive locations. Since the pure rent-seeking tax rate $\tau_j^*(\theta_j)$ increases with θ_j faster than the weighted tax rate $\tau_j(\theta_j)$, and the pure rent-seeking public goods expenditure $s_j^*(\theta_j)$ decreases with θ_j faster than the weighted public goods expenditure $s_j(\theta_j)$, the negative effect of a greater rent-seeking motive on mean utility, $\frac{\partial U_j}{\partial \delta}$, is greater in more productive locations:[9]

$$COV\left(\theta_j, \frac{\partial \bar{U}_j}{\partial \delta}\right) < 0.$$

In other words, government rent-seeking disproportionately reduces the desirability of more productive locations. Given the above two conclusions, we proceed to analyze the comparative statics of national welfare and economic output.

National Welfare Define the national welfare as the expected utility of a worker before choosing a location:

$$V = \ln\left(\sum_j \exp\left(\bar{U}_j\right)\right).$$

The effect of an increase in rent-seeking motive $\Delta\delta$ on the national expected utility V can be written as

$$\Delta V = \Delta\delta\frac{\partial V}{\partial \delta} = \frac{\sum_j \exp(\bar{U}_j)\frac{\partial \bar{U}_j}{\partial \delta}}{\sum_{j'}\exp(\bar{U}_{j'})} = \Delta\delta\sum_j P_j\frac{\partial \bar{U}_j}{\partial \delta} = \Delta\delta E\left(\frac{\partial \bar{U}_j}{\partial \delta}\right).$$

[9]The weighted tax rate and public goods expenditure adjust at a slower rate then their rent-seeking counterparts. This follows from taking derivatives with respect to θ_j: $\frac{\partial \tau_j(\theta_j)}{\partial \theta_j} = \delta\frac{\partial \tau_j^*(\theta_j)}{\partial \theta_j}$ and $\frac{\partial s_j(\theta_j)}{\partial \theta_j} = \delta\frac{\partial s_j^*(\theta_j)}{\partial \theta_j}$. Since $0 < \delta < 1$, it follows that $\frac{\partial \tau_j^*(\theta_j)}{\partial \theta_j} > \frac{\partial \tau_j(\theta_j)}{\partial \theta_j}$ and $\frac{\partial s_j^*(\theta_j)}{\partial \theta_j} > \frac{\partial s_j(\theta_j)}{\partial \theta_j}$

Thus, the impact of government rent-seeking on national welfare is simply the mean of its effect on the utility of each location, which is clearly negative. The magnitude of this welfare loss depends on the migration elasticity and housing supply elasticity.

National Economic Output The impact of rent-seeking on national output is less obvious. In our model, the output is produced linearly with local employment and productivity, and total labor supply is fixed. Thus, rent-seeking only reduces national output by diverting labor supply from high-productivity locations:

$$\begin{aligned}
\Delta Y &= \Delta\delta \sum \theta_j \frac{\partial L_j}{\partial \delta} = \Delta\delta \cdot L \sum \theta_j P_j \left(\frac{\partial \bar{U}_j}{\partial \delta} - \sum_{j'} P_{j'} \frac{\partial \bar{U}_{j'}}{\partial \delta} \right) \\
&= \Delta\delta \cdot L \left(COV\left(\theta_j, \frac{\partial \bar{U}_j}{\partial \delta}\right) + E(\theta_j) \underbrace{E\left(\frac{\partial \bar{U}_j}{\partial \delta} - \sum_{j'} P_{j'} \frac{\partial \bar{U}_{j'}}{\partial \delta} \right)}_{=0} \right) \\
&= \Delta\delta \cdot L \cdot COV\left(\theta_j, \frac{\partial \bar{U}_j}{\partial \delta}\right).
\end{aligned}$$

The equation shows that the change in national output depends directly on the covariance between local productivity and the impact of rent-seeking on local desirability. Since our mechanism predicts that local productivity is a driver of government rent-seeking, the locations where workers are discouraged from moving are those with the highest productivity. Thus, the negative covariance between local productivity and the impact of rent-seeking on location desirability reflects the economic cost of government rent-seeking, as it misallocates labor away from the most productive areas.

In summary, we have shown that local government rent-seeking can reduce aggregate welfare and national economic output through costly spatial misallocation of labor and productivity. Next, we discuss the empirical tests for the existence of the rent-seeking mechanism outlined in our model.

2.7 Model Predictions and Empirical Tests

2.7.1 Spatial Correlation Between Tax Rates and Productivity

The direct prediction of the model is that rent-seeking governments should impose higher tax rates in more productive locations, and the extra tax revenue would not be allocated towards increased provision of public goods. To empirically test the prediction, we examine whether state and local governments' tax rates tend to be higher in jurisdictions with higher private-sector productivity.

However, an alternative explanation of this relationship is that residents in high-productivity areas may have stronger preferences for public goods. If so, we would still observe a positive correlation between tax rates and productivity, even without government rent-seeking. Ideally, we would test whether tax rates are positively correlated with private-sector productivity, holding constant both public goods provision and preferences for public goods. However, it is difficult to perfectly measure both variables.

Moreover, the positive relationship between tax rates and productivity could be driven by the Baumol effect: if public-sector productivity does not vary with private-sector productivity, under the assumption that the demand for public goods is income elastic but highly price inelastic, the *price* of public goods may be higher in places where private-sector productivity is higher (Baumol, 1967). This could lead to higher tax rates in more productive locations, even in the absence of either rent-seeking motive or public-good preference heterogeneity. Appendix A3 presents a model of the Baumol effect and its implications.

2.7.2 Public-Private Wage Gap

To test for government rent-seeking and distinguish the mechanism from alternative explanations such as heterogeneous preferences for public goods or the Baumol effect, we analyze the allocation of government rents. Specifically, we examine whether these rents are channeled into higher compensation for government workers.[10] Government workers can leverage their political and institutional power to pressure governments for higher compensation (Freeman, 1986). If a fraction of the rent is indeed distributed to government workers, then the relative wages of government workers compared with their private-sector counterparts should depend on the government's ability to extract rents through taxation. Therefore, to test whether higher productivity facilitates government rent-seeking, we examine whether the wage gap between government and private-sector workers is larger in more productive locations, holding observable characteristics of workers and locations constant.

We extend our baseline model to formalize this argument: If the local government does not allocate any rents to government workers, then their wages (W_g) should equal private-sector wages (henceforth referred to as W_{-g} for distinction), $W_{j,g} = W_{j,-g} = \theta_j$, due to free mobility of labor between sectors, as discussed in Section 2.2. However, if a fraction ζ of the total government rent is distributed to public-sector workers, their

[10] Governments can distribute extra proceeds in various ways in addition to increasing government worker compensation. For example, they may allocate funds to other governments or lobbying groups (Bai et al., 2019).

compensation will consist of the rent-free wage, θ_j, and the additional rent per government employee.

To sustain this extra compensation, the bargaining process between public-sector workers and governments must eliminate free labor mobility. In the absence of mobility between sectors, the number of public-sector workers, $L_{j,g}$, is determined by the total local public goods spending, $B_j s_j$, divided by the unit cost of public goods, $\frac{\theta_j}{\alpha_j}$, and the public-sector productivity, α_j. This implies that $L_{j,g} = \frac{B_j s_j}{\theta_j}$. Hence, the public-sector wage is given by

$$\begin{aligned} W_{j,g} &= \theta_j + \frac{\zeta B_j(\tau_j - s_j)}{L_{j,g}} \\ &= \theta_j + \underbrace{\frac{\zeta B_j(\tau_j - s_j)}{\frac{B_j s_j}{\theta_j}}}_{\text{Rent per employee}}. \end{aligned}$$

Using Equation 3, we can show that the public-private wage gap is a function of migration elasticity, local tax rate, and public good provision:

$$\frac{W_{j,g}}{W_{j,-g}} = 1 + \zeta\left(-\frac{1}{\varepsilon_{L,\tau,j}}\right)\frac{\tau_j}{s_j}. \tag{6}$$

We have shown that $\varepsilon_{L,\tau,j}$ is negative and its absolute value decreases as local productivity θ_j increases. Moreover, τ_j increases with θ_j, and s_j decreases with θ_j. Thus, if local governments have rent-seeking motives and $\zeta \neq 0$, the public-private wage gap should be greater in more productive locations. This provides another way to identify government rent-seeking—testing whether the local public-private wage gap correlates with private-sector productivity.

However, the observed positive spatial relationship between the public-private wage gap and productivity may still be driven by the Baumol effect. If labor mobility between the public and private sectors is imperfect for reasons unrelated to government workers' bargaining power or lobbying effects, then higher local private-sector productivity could also result in higher wage premium for government workers due to the Baumol effect. Appendix A3.2 presents a model of the Baumol effect under the assumption of no labor mobility between public and private sectors.

2.7.3 Collective Bargaining Laws

To further address concerns that the Baumol effect may spuriously drive the positive relationship between the public-private wage gap and productivity, we follow the approach of Brueckner and Neumark (2014) and

Diamond (2017) by examining whether this relationship differs between states that allow collective bargaining and those that prohibit it. The rational is that public-sector collective bargaining strengthens government workers' ability to pressure governments for higher compensation (Freeman, 1988; Acemoglu et al., 2001).

Specifically, we expect $\zeta > 0$ to hold in states that allow collective bargaining, and therefore the public-private wage gap should be more responsive to local productivity under government rent-seeking, according to Equation 6. In contrast, in states that prohibit collective bargaining, we expect $\zeta \rightarrow 0$, and thus little or no response of the wage gap to productivity.

This analysis helps distinguish government rent-seeking from the Baumol effect. If the spatial relationship between the public-private wage gap and productivity were solely driven by the Baumol effect, it should not differ by the legality of collective bargaining (or by the size of ζ). This is because the Baumol effect is an equilibrium outcome driven by income effects and inelastic demand for public goods, and thus it should be independent of whether government workers can collectively bargain.

2.7.4 Local Government Financial Independence

Lastly, we introduce an additional test to distinguish government rent-seeking from the Baumol effect by exploiting variation in local governments' financial independence. Specifically, we examine whether the wage gap between *local* government workers and private-sector workers is influenced by *state* productivity, particularly in jurisdictions where local governments rely more on *transfers* from the state government.

The intuition is that if the wage premium of local government workers stems from the Baumol effect, the wage premium should depend solely on the productivity of the local area where the government workers serve. However, if *local* government workers' wages are partly funded through distributed rents from the *state* government, the wage premium of local government workers should also depend on the rent-seeking ability of the *state* government.

To formalize this idea, we rewrite local government workers' compensation as a function of both local government (j) and state government (j') rents, where ω represents the degree of fiscal independence of the local government, and ζ and ζ_{state} represent local government workers' ability to bargain with local and state governments, respectively:

$$W_{j,g} = \theta_j + \frac{\omega\zeta B_j(\tau_j - s_j) + (1-\omega)\zeta_{state} B_{j'}(\tau_{j'} - s_{j'})}{\frac{B_j s_j}{\theta_j}}.$$

With some rearrangement, we obtain the expression for the public-private wage gap:

$$\frac{W_{j,g}}{W_{j,-g}} = 1 + \frac{1}{s_j}\left(\omega\zeta\left(-\frac{1}{\varepsilon_{L,\tau,j}}\right)\tau_j + (1-\omega)\frac{B_{j'}}{B_j}\zeta_{state}\left(-\frac{1}{\varepsilon_{L,\tau,j'}}\right)\tau_{j'}\right).$$

This expression implies that, in the presence of government rent-seeking and legal collective bargaining ($\zeta > 0$), for government workers in municipalities that rely more on state government transfers (i.e., where ω is smaller), the wage premium for local government workers should depend more on the rent-seeking ability of the *state* government, namely state productivity.[11] Therefore, the wage gap between local government workers and private-sector workers should be more sensitive to state-level productivity in areas where local governments receive a larger share of their revenue from state transfers.

Summary We derive four empirical predictions from the model to test for government rent-seeking and distinguish the mechanism from alternative explanations:

Prediction 1: Tax rates should be higher in locations with higher private-sector productivity.

Prediction 2: The wage gap between government and private-sector workers should be larger in more productive locations, controlling for worker characteristics.

Prediction 3: The positive relationship between the public-private wage gap and local productivity should be stronger in states where public-sector collective bargaining is allowed.

Prediction 4: In areas where local governments rely more on state transfers, the wage gap between local government workers and private-sector workers should be more sensitive to state-level productivity.

3 Data

We use data from multiple sources to test the model's predictions and analyze how spatial productivity premiums affect government rent-seeking.

[11] Note that when local government workers' compensation is influenced by state government rents, the effect of higher *state* productivity on the wage premium of local government workers operates through two channels: (i) State-level migration elasticity ($\varepsilon_{L,\tau,j'}$): Higher state productivity reduces migration elasticity, making it easier for the state government to extract rents. (ii) State tax base ($B_{j'}$): Increased state productivity expands the tax base, allowing the state government to extract more rents. Both mechanisms are driven by government rent-seeking behavior, as the public-private wage gap would be zero in the absence of rent-seeking.

3.1 Annual Survey of State and Local Government Finances

The Annual Survey of State and Local Government Finances provides detailed state and local government data on revenues and expenditures by governmental function. A census covering all state and local governments is conducted every five years (years ending in "2" and "7"). Local governments include county, township, municipality, school district, and special district governments.

We use data for 1987, 1997, 2007, and 2017 to measure county-area and state-area government revenue and expenditure (Pierson et al., 2015). To measure county-area revenue and expenditure, we aggregate revenue and expenditure of all local governments located in a county. To measure state-area revenue and expenditure, we aggregate revenue and expenditure of the state government and all local governments located in the state. We approximate the county or state tax rate using per capita tax revenue divided by the average income.

Table 1 Panel A presents summary statistics. On average, 39% of the state-area government revenue comes from taxes, with corporate taxes contributing less than 5% of the total tax revenue. Expenditures on wages and salaries account for roughly 25% of total state-area expenditures. To measure the tax burden on residents within a state, we use tax revenue per capita as a share of average state income: the average burden is 8% using total tax revenue and 7.7% when excluding corporate taxes. The table also reports the corresponding statistics for the county areas. Local governments rely more heavily on intergovernmental transfers, which make up 34% of total revenue in the county area. The county-area tax burden is on average 3.5%, and corporate taxes represent only 0.2% of the total county tax revenue.

3.2 Current Population Survey

We use data from the Current Population Survey (CPS) Annual Social and Economic Supplement (ASEC) to measure spatial differences in wage residuals and to analyze public-private sector wage gaps across states and MSAs. The data provide detailed measures of annual income along with information on demographic, employment, and geographic characteristics. Importantly, the data identify whether a worker is employed in the private or public sector, and the public sector includes federal, state, and local government workers. This allows us to examine how the wage gap between public- and private-sector workers differs across locations while controlling for observable worker characteristics.

We focus on the period from 1977–2019 because the data distinguish between federal, state, and local government employees since 1976.[12] We restrict the sample to workers aged from 25–65, working at least 35

[12] We exclude the 1976 data because 38 states cannot be separately identified.

hours per week, and having positive wage income. We exclude workers whose wages are imputed to avoid bias in the wage gap analysis due to CPS's imputation algorithm. Wages are deflated by the CPI and measured in real 1999 dollars. To estimate wage residuals by state and MSA over time and match them with the survey years of the state and local public finance data, we pool CPS data into four periods: 1977–1989, 1990–1999, 2000–2009, and 2010–2019. Pooling the data increases statistical power and reduces measurement error.

Table 1 Panel B presents summary statistics for workers in the private sector, federal government, state governments, and local governments separately. The raw hourly wages are higher for all three types of government workers than for private-sector workers, consistent with the literature (e.g., Diamond, 2017).

3.3 Annual Survey of Public Pensions

The Annual Survey of Public Pensions provides data on contributions and benefits for state- and locally-administered defined benefit retirement plans. It includes the dollar value of annual contributions made by both governments and employees to retirement funds, the number of active members, the total annual benefits disbursed to beneficiaries, and the number of eligible beneficiaries.

We use the data to compute average government contributions to retirement plans at the state and county levels. Specifically, we divide total government contributions for each state or county by the number of active members. Similarly, we compute average benefits by dividing the total benefits disbursed by the total number of eligible beneficiaries.

3.4 Public Sector Collective Bargaining Laws

We use the dataset on public sector collective bargaining laws initially developed by Freeman and Valletta (1988). This dataset was subsequently expanded by Kim Rueben and provides annual data up until 1996. For our analysis concerning the legality of collective bargaining, we merge the CPS data with the observed laws on an annual basis until 1996. For the CPS data after 1996, we merge them with the 1996 law since the collective bargaining laws remained relatively stable after 1996 (Diamond, 2017).

3.5 Amenities, Public goods, Land Unavailability, and Political Preferences

Amenities We obtain county-specific measures of natural amenities, including proximity to lakes and sea shores, January and July temperatures, and annual precipitation from the publicly available replication package of Lee et al. (2019).

Public Goods We obtain data on local public goods provision from multiple sources. First, we use road quality data from the Bureau of Transportation Statistics, which provides the percentage of roads in acceptable condition by state for 1997, 2007, and 2017. Second, we use data from the National Environmental Public Health Tracking Network on the number of hospital beds for 100,000 residents by county for 2020. Third, we obtain student and teacher counts at the school district level from the Common Core of Data (CCD) provided by the National Center for Education Statistics (NCES). Using these data, we calculate the teacher-student ratio for each school district for 1987, 1997, 2007, and 2017, and match school districts to their corresponding counties to calculate the average teacher-student ratio at the county level. Fourth, we obtain county-level arrest counts for all offenses from the Uniform Crime Reporting Program Data provided by the Federal Bureau of Investigation. We use these data to calculate the arrest rate at the county level for 1987, 1997, 2007, and 2017. Lastly, we use the National Fire Incident Reporting System Public Data Release files for 1987, 1997, 2007, and 2017, which provide information on fire department responses to incidents. Specifically, we calculate the average response time (in minutes) for all reported fire incidents within each county and year—a commonly used measure of fire department performance.

Land Unavailability We employ Saiz (2010)'s measure of land unavailability at the MSA level.

Political Preferences We collect voting data at both the state and county levels to account for political preferences. We obtain state-level voting data from the MIT Election Lab during the U.S. Presidential elections of 1980, 1992, 2000, and 2016. For county-level voting data in the same years, we use Dave Leip's U.S. Election Atlas (Leip, 2023). We use the voting percentages from these election years to proxy local political preferences in 1987, 1997, 2007, and 2017, respectively. Additionally, we source party affiliations of state governors from Kaplan (2021).

4 Empirical Results

4.1 Measuring Local Productivity

Wage Residuals We begin by approximating local productivity using wage residuals, following Hsieh and Moretti (2019). This approach captures wage differences among *observably* similar workers living across different locations in the US.

To estimate wage residuals, for each time period, we regress private-sector workers' log hourly wages on various demographic and work characteristics, including dummies for age, sex, race, Hispanic origin, marital status, education, industry, and occupation. We then compute the mean of the log wage residuals at the state or MSA level for each period, subtracting the national mean.

If the set of observable characteristics fully accounts for worker sorting across locations, then the location-specific mean log wage residuals can be interpreted as location wage premiums, representing the causal effect of a location on wages. However, individuals may sort into cities or states based on unobservable characteristics. In particular, if high-ability workers are more likely to choose high-productivity locations, our estimated wage residuals may overstate the true causal effect of location on wages. To address unobservable sorting, we also use the location premium estimated by Card et al. (2025).

Location Premium by Card et al. (2025) Card et al. (2025) use matched employee-employer data from the U.S. Census Bureau's Longitudinal Employer-Household Dynamic (LEHD) program to estimate average earning differences across commuting zones (CZs). They first regress log quarterly earnings on age, time, worker fixed effects, and establishment fixed effects, and then average the estimated establishment effects at the CZ level. However, they show that this step alone may underestimate location pay premiums because workers who move from lower- to higher-paying locations tend to come from above-average workplaces to below-average workplaces. After adjusting for this selective mobility between establishments at different payment levels among movers, their resulting CZ premiums provide the causal effect of location on earnings.

Unfortunately, Card et al. (2025) cannot report their exact CZ premium estimates from the LEHD due to census disclosure rules. Instead, they construct predictions of their CZ premiums using the American Community Survey, and they show that these predictions correlate at 0.9 with the LEHD estimates. Thus, in our paper, we also use the predicted CZ premiums from Card et al. (2025). We then compute state-level premiums using the average of CZ premiums at the state level, weighted by the CZ population.

One concern is whether these location premiums capture local productivity premiums. While location wage premiums may not be driven entirely by productivity, this does not pose a problem. Although our model assumes that local wage premiums stem from productivity differences, in practice, what influences workers' location choice is likely the wage premium they receive rather than productivity itself. For simplicity, we use the terms local productivity and local wage premiums interchangeably throughout the remainder of the paper.

The location premiums from Card et al. (2025) are prone to sorting but have several limitations for our study. First, they do not vary over time. Second, since the premiums are at the CZ level, we match them to workers in the CPS using county information for our worker-level analysis. However, in CPS, county information is missing for many observations and is only available after 1995. Thus, using CZ premiums in some analyses leads to a significant loss of observations. Lastly, the CZ premiums are estimated using all workers, whereas we ideally want a measure of local productivity for the private sector.

Given these limitations, in the main text, we present results using our estimated wage residuals, while in the Appendix, we provide all corresponding results using the location premiums from Card et al. (2025). We find that both measures yield very similar results both qualitatively and quantitatively. Figure 2 illustrates the relationship between the two productivity measures. In Figure 2a, each observation is a county. The x-axis shows the log earnings premium of the CZ containing the county, and the y-axis shows the log wage residual of the MSA containing the county. The scatter plot is weighted by county population and reveals a strong positive relationship between the two measures. Figure 2b presents the corresponding binned scatter plot, where the slope of the fitted line is close to 1 and the R-squared is around 0.8. Given the high correlation between the two measures, we are less concerned about potential bias from unobserved worker sorting when using our estimated wage residuals.

4.2 Government Revenue and Expenditure Regressions

Our first empirical prediction is that rent-seeking governments should impose higher tax rates in locations with higher productivity. The extra tax revenue should not be solely spent on public goods provision. We test this prediction by examining how state and local governments' revenue and expenditure per local resident as a fraction of local residents' average income vary by local wage premium. Specifically, we estimate the following regression at the state and county level:

$$\ln G_{jt} = \alpha_t + \beta \ln \hat{\theta}_{jt} + \epsilon_{jt}. \tag{7}$$

In the *state-level* regression, G_{jt} denotes the revenue or expenditure of the state government and local governments located in state j per state resident as a fraction of the state's average income in year t. $\ln \hat{\theta}_{jt}$ is the estimated log wage residual of state j in year t using CPS data or the state-level log earnings premium from Card et al. (2025), as described in Section 4.1. In the *county-level* regression, G_{jt} denotes the revenue or expenditure of local governments located in county j collected per county resident as a fraction of the average income of county j in year t. $\ln \hat{\theta}_{jt}$ is the estimated log wage residual of the MSA that contains county j in year t,[13] or the log earnings premium of the CZ that contains county j from Card et al. (2025). We control for year fixed effects α_t in all regressions and further control for state fixed effects in county-level regressions.

Taxation Table 2 Panel A presents the state-level regression results and Panel B presents the county-level regression results using our estimated wage residuals. Column 1 reports the results for the tax rate, approximated using governments' total tax revenue per capita as a fraction of the average income. Consistent with **Prediction 1**, the estimate in Panel A suggests that a 1% increase in the state wage residual is associated with a 1.2% increase in the state's tax rate. Panel B suggests a similar positive correlation at the county level. Column 2 presents the results using governments' tax revenue excluding corporate tax (i.e., tax on licenses pertaining to all corporations and tax on the income of corporations). This does not affect the results.

Table A1 in the appendix follows the same format as Table 2 but presents results using the location premiums from Card et al. (2025). The results remain consistent.

Table A2 in the appendix, Columns 2 and 5, show that the positive relationship between tax rates and local productivity remains robust across both productivity measures after controlling for local demographics, natural amenities, land unavailability, and political preferences.[14] Columns 3 and 6 further show that the relationship holds even after excluding states that do not collect state income taxes.

In Column 3 of Table 2, we examine governments' non-tax revenue, including transfers from other governments, fees collected for providing services, utility revenue, liquor store revenue, and contributions and investment earnings for all social insurance programs. We consider non-tax revenue because it is less likely to be driven by government rent-seeking. Consistently, the results in Column 3 suggest that per capita non-tax revenue as a fraction of the local residents' average income is *not* positively correlated with local wage residuals at either the state or county levels.

[13] To match the government finance outcomes in 1987, 1997, 2007, and 2017 from the Annual Survey of State and Local Government Finances, we estimate $\ln \hat{\theta}_{jt}$ using the CPS data for 1977-1989, 1990–1999, 2000–2009, and 2010–2019, respectively. For the county-level regressions, we measure the average income and the log wage residual at the MSA level. This is because the number of counties identified in the CPS data is very limited. Therefore, we use the MSA-level measurement to reduce measurement error.

[14] Specifically, we control for the share of workers with college degrees as a proxy for preferences for public goods (Diamond, 2016). Natural amenities include average proximity to lakes or seashores, weather mildness—measured by$(|\text{January minimum degree} - 20°C| + |\text{July maximum degree} - 20°C|)/2$—and annual precipitation. Land unavailability is measured by the share of land within 50 km of a city center that is unavailable for real estate development due to geographic constraints (Saiz, 2010). To capture political preferences, we include the vote shares for the Demographic and Republican parties, and an indicator for the state governor's party affiliation. We also control for the number of counties within each state or MSA as a proxy for local government competition. State-level regressions use corresponding state-level statistics; county-level regressions use corresponding MSA-level statistics.

Public Goods The model predicts that the greater tax revenue collected by rent-seeking governments in high-productivity areas will not be allocated towards increased provision of public goods. Unfortunately, we do not have a direct measure of government expenditure on public goods provision. As an approximate, we consider government expenditure excluding government payroll, using government payroll to approximate the expenditure for governments' interest (e.g., increasing government employment or raising public sector wages). This is a very rough approximate because the actual provision of public goods may require an increase in the number of government workers. While recognizing the limitation of this measure, the estimates in Column 4 of Table 2 show that there is not a statistically significant positive correlation between governments' non-payroll expenditure per capita as a fraction of local income and local wage residuals.

Next, Table 3 examines alternative proxies for public goods provision, including road quality (share of roads in acceptable condition), healthcare resources (number of hospital beds per 100,000 residents), school quality (teacher-student ratio), public safety (arrest rates), and fire department performance (response time). We find no positive correlation between these measures and local wage residuals, particularly after controlling for local demographics, natural amenities, land unavailability, and political preferences.[15] Some measures even show negative correlations. For example, the teacher-student ratio is negatively correlated with local wage residuals. It is important to note that this does not necessarily imply that governments in high-productivity areas provide fewer or lower-quality public goods; the negative relationship may reflect higher demand for private education in these areas. Instead, the results provide some evidence that higher tax revenue in productive areas is unlikely to have been fully *directed toward* expanding or improving public goods, based on these available measures. Thus, the findings help support our government rent-seeking hypothesis.

In summary, the results in this section provide evidence that residents in more productive locations tend to face higher tax rates, supporting our empirical **Prediction 1**. However, the positive correlation between tax rates and local productivity could stem from different preferences for public goods across locations rather than government rent-seeking motives. Additionally, the observed spatial correlation could be driven by the Baumol effect, as discussed in section 2.7.1. To further test for government rent-seeking and distinguish it from the alternative mechanisms, we examine whether the excess tax revenue collected in high-productivity areas translates into higher compensation to government workers relative to private-sector workers.

[15] Higher arrest rates may reflect either worse public safety or greater investment in policing. However, their correlation with MSA wage residuals is not statistically significant once MSA-level controls are added.

4.3 Public-Private Wage Gap Regressions

In this section, we analyze whether government workers in more productive areas get higher wages compared with private-sector workers with similar observable characteristics.

Public-Private Wage Gap We empirically test our **Prediction 2** by exploiting the variation in spatial wage premium at both the state and MSA (or CZ) levels. First, we exploit variation in log wage residuals across *states* and examine the wage gap between *state* government workers and private-sector workers with similar observable characteristics. To do so, we use individual-level data from CPS, restricting the sample to state government workers and private-sector workers, and estimate the following regression:

$$\ln W_{ijt} = \alpha_t + \gamma_j + \beta_1 Gov_{ijt} + \beta_2 \ln \hat{\theta}_{jt} + \beta_3 Gov_{ijt} \cdot \ln \hat{\theta}_{jt} + \Lambda' X_{ijt} + \epsilon_{ijt}, \quad (8)$$

where W_{ijt} is the hourly wage of worker i in state j in year t; Gov_{ijt} is a dummy for whether worker i is a government worker; $\ln \hat{\theta}_{jt}$ is the private-sector log wage residual for state j in year t (or the state earnings premium from Card et al. (2025), which does not vary over time); X_{ijt} is a vector of individual characteristics, including dummies for age, gender, race, Hispanic origin, education, and interactions between the public dummy and occupation dummies. We control for the interaction terms to ensure that we compare public- and private-sector workers in the same occupation. We include year fixed effects, α_t, and we only include state fixed effects, γ_j, when we use our estimated state wage residuals for $\ln \hat{\theta}_{jt}$, as they vary over time. The parameter of interest is β_3, which measures how the wage gap between state government workers and private-sector workers varies by state wage premiums. The model predicts that $\beta_3 > 0$.

Results based on our estimated wage residuals are presented in Table 4 Panel A. Consistent with **Prediction 2**, we find that the wage gap between state government workers and private-sector workers increases by 0.4% with a 1% increase in the state wage residual. Using Card et al. (2025)'s state premiums, we find that a 1% increase in the state wage premium leads to a 0.6% increase in the wage gap (Table A3 Panel A).

Table A4 Panel A shows that the results based on both productivity measures remain robust after controlling for local factors—including demographics, natural amenities, land unavailability, and political preferences—and after excluding states without state income taxes.

As a falsification test, in Column 2 of Tables 4 and A3, instead of using state government workers, we restrict the sample to *federal* government workers and private-sector workers. The rational is that state governments' rent-seeking should not raise federal government workers' compensation. Consistently, Column 2 shows that the wage gap between federal government workers and private-sector workers is even lower in more productive states.

In addition to exploiting variation in wage residuals across states, we exploit variation across MSAs (or CZs) to examine the wage gap between *local* government workers and private-sector workers. Specifically, we restrict the sample to *local* government workers and private-sector workers and estimate Equation 8, where the location subscript j represents MSA or CZ.

Column 1 of Table 4 Panel B shows that a 1% increase in the MSA wage residual is associated with a 0.19% increase in the wage gap between local government workers and private-sector workers. This result remains the same when using Card et al. (2025)'s CZ premiums, as shown in Column 1 of Table A3 Panel B.

Local Government Financial Independence Next, we test **Prediction 4** by examining whether the wage gap between local government workers and private-sector workers is influenced by *state* productivity. As discussed in Section 2.7.4, this is motivated by the fact that a large fraction of local government revenue often comes from state government transfers. If the positive relationship between the public-private wage gap and local productivity is driven by government rent-seeking, then state productivity should also affect the wage premium of local government workers, particularly in local governments with lower financial independence. This analysis helps distinguish government rent-seeking from the Baumol effect: If the Baumol effect were the sole driver, the wage gap would depend only on local productivity—the productivity of the areas where local government workers are employed—rather than state-level productivity.

In Column 2 of Table 4 Panel B, we restrict the sample to *local* government workers and private-sector workers and estimate Equation 8, further controlling for the *state* log wage residual and its interaction with the local government worker dummy. We find that the wage gap between local government and private-sector workers increases with the state-level wage residual, even after controlling for the MSA-level wage residual.

We further explore variations in financial independence across local governments, as state government rent-seeking may have a greater impact on the wage premium of local government workers in less financially independent local governments. To test this, we estimate the following equation:

$$\begin{aligned}\ln W_{ijst} &= \alpha_t + \gamma_j + \beta_1 Gov_{ijst} + \beta_2 \ln\hat{\theta}_{jt} + \beta_3 Gov_{ijst}\cdot\ln\hat{\theta}_{jt} + \beta_4 Gov_{ijst}\cdot z_{jst}^{tax}\cdot\ln\hat{\theta}_{jt} \\ &+ \beta_5\ln\hat{\theta}_{st} + \beta_6 Gov_{ijst}\cdot\ln\hat{\theta}_{st} + \beta_7 Gov_{ijst}\cdot z_{jst}^{trans}\cdot\ln\hat{\theta}_{st} + \beta_8 z_{jst}^{tax} + \beta_9 z_{jst}^{trans} \\ &+ \beta_{10} z_{jst}^{tax}\cdot\ln\hat{\theta}_{jt} + \beta_{11} z_{jst}^{trans}\cdot\ln\hat{\theta}_{st} + \beta_{12} Gov_{ijst}\cdot z_{jst}^{tax} + \beta_{13} Gov_{ijst}\cdot z_{jst}^{trans} \\ &+ \Lambda' X_{ijt} + \epsilon_{ijt},\end{aligned} \tag{9}$$

where W_{ijt} is the hourly wage of worker i in MSA j state s in year t; $\ln\hat{\theta}_{jt}$ is the log wage residual of MSA j in year t; $\ln\hat{\theta}_{st}$ is the log wage residual of state s; z_{jst}^{tax} is the average share of local governments' total revenue derived from taxes for local governments locating in MSA j within state s; z_{jst}^{trans} is the average share of local governments' total revenue derived from the state government transfers for local governments locating in MSA j within state s; other variables are defined the same as in Equation 8. The parameters of interest are β_4 and β_7. We predict that for local governments with a greater share of revenue derived from local taxes, the wage gap between local government and private-sector workers depends more on local productivity ($\beta_4 > 0$). For local governments with a greater share of revenue derived from state transfers, the wage gap depends more on state productivity ($\beta_7 > 0$).

Column 3 of Table 4 Panel B shows that the estimates of both β_4 and β_7 are positive and statistically significant. Table A3 Panel B presents the estimates using Card et al. (2025)'s location premiums, where $\ln\hat{\theta}_{jt}$ represents the log earnings premium of CZ j without time variation. The conclusion remains unchanged, although the estimate of β_4 is insignificant, likely due to the loss of observations or reduced variation in $\ln\hat{\theta}_{jt}$ in this analysis. Table A4 Panel B shows that these findings remain robust after controlling for local factors and excluding states without state income taxes.

Lastly, we conduct two falsification tests. Column 4 of Table 4 Panel B shows that the wage gap between *state* government and private-sector workers does not increase with MSA productivity, after controlling for state productivity. This is expected, as state government workers' compensation should not depend on local government rent-seeking. Column 5 shows that neither state nor MSA productivity raises the wage gap between *federal* government and private-sector workers. This is also expected, as federal government workers' compensation should not be affected by state or local government rent-seeking. The corresponding columns of Table A3 Panel B show that the conclusions remain unchanged when using Card et al. (2025)'s location premiums.

In summary, the results in Tables 4, A3, and A4 show that higher state productivity is associated with higher wages of state government workers relative to comparable private-sector workers. Higher state productivity also leads to a greater wage premium for local government workers in areas where a larger share of local government revenue comes from state transfers. In contrast, in areas where local tax revenue constitutes a larger portion of local government revenue, the wage gap between local government and private-sector workers increases with *local* productivity. These findings support **Prediction 2** and **Prediction 4**, providing evidence for the existence of government rent-seeking driven by local productivity. Furthermore, the heterogeneity across locations with different levels of local government financial independence suggests that our results are unlikely to be solely explained by preferences for public goods or the Baumol effect.

Collective Bargaining Laws We now turn to **Predication 3** and examine whether the relationship between the public-private wage gap and local productivity varies based on state-level collective bargaining laws. To test this, we estimate the following equation:

$$\ln W_{ijt} = \alpha_t + \gamma_j + \beta_1 Gov_{ijt} + \beta_2 \ln \hat{\theta}_{jt} + \beta_3 Gov_{ijt} \cdot \ln \hat{\theta}_{jt} + \beta_4 Gov_{ijst} \cdot Barg_{jt} \cdot \ln \hat{\theta}_{jt} \quad (10)$$
$$+ \beta_5 Barg_{jt} + \beta_6 Barg_{jt} \cdot \ln \hat{\theta}_{jt} + \beta_7 Gov_{ijt} \cdot Barg_{jt} + \Lambda' X_{ijt} + \epsilon_{ijt}.$$

We first examine the wage gap between *state* government and private-sector workers. Gov_{ijt} is an indicator for state government workers; $\ln \hat{\theta}_{jt}$ is the log wage residual for state j in year t; and $Barg_{jt}$ is an indicator that collective bargaining is legal for state government workers in state j and year t. While variation in state collective bargaining laws is unlikely to be random, this does not impose a threat to identification, as our focus in on the relationship between the public-private wage gap and productivity across states with the same type of collective bargaining laws. Following Diamond (2017), our key identifying assumption is that the different *relationship* between the wage gap and productivity in states with and without legal collective bargaining is solely driven by the difference in their collective bargaining laws.

Table 5 presents results using our estimated state wage residuals. Column 1 of Panel A shows that in states where collective bargaining is illegal, higher state wage residuals are not positively associated with a greater wage gap between state government and private-sector workers. In contrast, in states where collective bargaining is legal for state government workers, a 1% increase in state wage residuals is associated with a 0.47% increase in the wage gap between state government and private-sector workers. Similarly, the corresponding column in Table A5, using Card et al. (2025)'s state premiums, shows that in states with legal collective bargaining, a 1% increase in state wage premiums is associated with a 0.65% increase in the wage gap, and the positive relationship does not hold in states without legal collective bargaining.

As a falsification test, column 2 of Table 5 Panel A examines the wage gap between *federal* government and private-sector workers across locations. Unlike for state government workers, we find no evidence that in states where collective bargaining is legal, higher state productivity raises the wage premium of federal government workers. This is expected because federal workers' compensation should not be affected by state government rent-seeking.

Next, we examine the wage gap between *local* government workers and private-sector workers across MSAs or CZs by estimating Equation 10, where Gov_{ijt} is an indicator for local government workers; $\ln \hat{\theta}_{jt}$ is the log wage residual for MSA j in year t (or the log earnings premium for CZ j without time variation from Card et al. (2025)); $Barg_{jt}$ is an indicator that collective bargaining is legal for local government workers.

Column 1 of Table 5 Panel B shows that in states that allows collective bargaining for local government workers, a 1% increase in MSA wage residuals is associated with a 0.15% increase in the wage gap between local government and private-sector workers. Similarly, the corresponding column in Table A5, using Card et al. (2025)'s CZ premiums, shows that in states with legal collective bargaining, a 1% increase in CZ wage premiums is associated with a 0.654% increase in the wage gap. In both tables, this significant positive relationship does not hold in states without legal bargaining for local government workers.

Lastly, we conduct two falsification tests using state and federal government workers. Column 2 of Table 5 Panel B shows that in states where collective bargaining is legal for state government workers, *local* productivity does not increase the wage gap between state government and private-sector workers, after controlling for state productivity. This is reasonable since state government workers' compensation should not be influenced by local government rent-seeking. Column 3 shows that in states where collective bargaining legal for either state or local governments, neither state nor MSA productivity increases the wage gap between federal government and private-sector workers. This is expected as federal government workers' compensation should not be affected by state or local government rent-seeking.

Table A6 shows that the main results from both Tables 5 and A5 remain robust after controlling for local characteristics and excluding states without state income taxes.

In summary, the results in Tables 5, A5, and A6 suggest that higher productivity leads to higher wages for government workers relative to similar private-sector workers only in states that allow collective bargaining.

These findings are consistent with **Prediction 3**. Moreover, the heterogeneity across states with different collective bargaining laws helps distinguish government rent-seeking from the Baumol effect. This is because the Baumol effect arises from the income effect on the demand for public goods. Thus, its impact on the public-private wage gap should not depend on whether government workers can collectively bargain.

4.4 Defined Benefit Public Pensions

In addition to higher wages, another way to enhance government workers' compensation is through more favorable pension benefits. In this section, we conduct additional tests to examine the presence of government rent-seeking by investigating whether government workers receive higher pension benefits or enjoy greater government contributions in more productive locations. To do so, we estimate Equation 7 in Section 4.2. The outcome variable is the log ratio of benefits per beneficiary to average income (for current retirees) or log ratio of government contribution per member to average income (for current workers).

Table 6 Panel A presents state-level regression results. Column 1 shows that higher state wage residuals are associated with higher average pension benefits relative to state average income for state and local government beneficiaries. However, since defined benefit public pensions are typically determined by formulas established prior to the retirement of current beneficiaries, current pension benefits may reflect past rent extraction rather than the current rent-seeking ability. To account for this, Column 2 further controls for the state log wage residual from 10 years ago. The results suggest that pension benefits received by current retirees are positively correlated with state wage residuals 10 years ago, while the correlation with current wage residuals is statistically insignificant. Table A7 Panel A uses Card et al. (2025)'s state earnings premium and shows that average state pension benefits relative to state average income are positively correlated with state earning premiums. However, the state premium measure does not have a time variation.

Column 3 of both Tables 6 and A7, Panel A shows that average government pension contributions relative to average state income for current government pension plan members are higher in more productive states.

Panel B of Table 6 presents the county-level regression results. The results suggest that average pension benefits relative to average county income for local government beneficiaries are positively associated with lagged state wage residuals; the association with lagged MSA wage residuals is positive but statistically insignificant. These findings likely reflect the fact that many local pension plans receive financial assistance from state governments. Similarly, average government contributions relative to average county income for local government plan members are also positively associated with state wage residuals. We find similar results when using CZ premiums from Card et al. (2025), as reported in Table A7 Panel B.

In conclusion, the results in Tables 6 and A7 support the hypothesis that government rent-seeking extends beyond extra wage compensation for government workers to include higher pension benefits or greater government contributions to pension plans.

5 Conclusion

This paper proposes and tests the hypothesis that local productivity or wage premiums enable rent-seeking state and local governments to raise tax rates. Using a spatial equilibrium model, we show that if a government maximizes net tax revenue rather than resident utility, its ability to extract rents depends on the migration elasticity of local residents with respect to tax rates. The model shows that local productivity premiums reduce residents' tendency to relocate, thereby allowing rent-seeking governments to impose higher taxes.

We demonstrate that such rent-seeking behavior can have significant economic costs. It not only reduces welfare by exposing residents to higher taxes and fewer public goods, but also discourages workers from locating in high-productivity areas, thereby lowering national aggregate output.

To test government rent-seeking, we first show that more productive states and cities tend to have higher average tax rates. However, this positive relationship could also be driven by heterogeneous preferences for public goods or the Baumol effect, which occurs when the demand for public goods is income-elastic but price-inelastic.

To distinguish government rent-seeking from these alternative explanations, we derive additional predictions from the model, which are validated by empirical findings. We find that the public-private wage gap is positively associated with local productivity, controlling for worker characteristics. This relationship is particularly strong in states where public-sector collective bargaining is permitted. In addition, we show that the wage gap between local government workers and private-sector workers varies with state-level productivity, especially in areas where local governments rely more on transfers from state governments.

Our paper has several limitations. We employ a simple spatial equilibrium model to highlight the role of migration elasticity as a key factor in restraining government rent-seeking. Thus, we abstract away from several important margins. First, we do not model how voters can potentially curb local governments' rent-seeking behavior. Instead, we control for measures of local political preferences in our empirical analysis.

Second, we do not consider the traditional extensive and intensive margin responses of labor supply to local taxation, assuming instead that migration is the primary adjustment mechanism. In addition, we do not explicitly incorporate monopoly power in local labor markets, instead assuming that wages are determined by labor productivity. Our framework also does not account for other contributors to spatial tax variations, such as state and local tax deductions on federal income taxes. These are important areas for future research.

Lastly, our analysis focuses on the period before the widespread adoption of remote work. The rise of remote work could significantly alter migration elasticity in high-productivity locations, affecting taxation policies and public-sector wages in the decade following the COVID-19 pandemic. Our paper does not directly address this issue, and we leave this as an important topic for future research.

References

Acemoglu, D., Aghion, P., and Violante, G. (2001). Deunionization, technical change and inequality. *Cargenie-Rochester Conference Series on Public Policy*, 55(1):229–264.

Agrawal, D. (2015). The tax gradient: Spatial aspects of fiscal competition. *American Economic Journal: Economic Policy*, 7(2):1–29.

Agrawal, D., Hoyt, W., and Wilson, J. (2022). Local policy choice: Theory and empirics. *Journal of Economic Literature*, 60(4):1378–1455.

Akcigit, U., Grigsby, J., Nicholas, T., and Stantcheva, S. (2021). Taxation and innovation in the 20th century. *NBER Working Paper*, 24982.

Albouy, D. (2009). The unequal geographic burden of federal taxation. *Journal of Political Economy*, 117(4):591–784.

Bai, J., Jayachandra, S., Malesky, E., and Olken, B. (2019). Firm growth and corruption: Empirical evidence from vietnam. *Economic Journal*, 129(618):651–677.

Baumol, W. (1967). Macroeconomics of unbalanced growth: The anatomy of urban crisis. *American Economic Review*, 57(3):415–426.

Bewley, T. (1981). A critique of tiebout's theory of local public expenditures. *Econometrica*, 49(3):713–740.

Brennan, G. and Buchanan, J. (1980). *The Power to Tax*. Cambridge University Press.

Brueckner, J. (2000). A tiebout/tax-competition model. *Journal of Public Economics*, 77(2):285–306.

Brueckner, J. and Neumark, D. (2014). Beaches, sunshine, and public-sector pay: Theory and evidence on amenities and rent extraction by government workers. *American Economic Journal: Economic Policy*, 6(2):198–230.

Card, D., Rothstein, J., and Yi, M. (2025). Location, location, location. *American Economic Journal: Applied Economics*, 17(1):297–336.

Diamond, R. (2016). The determinants and welfare implications of us workers' diverging location choices by skill: 1980-2000. *American Economic Review*, 106(3):479–524.

Diamond, R. (2017). Housing supply elasticity and rent extraction by state and local governments. *American Economic Journal: Economic Policy*, 9(1):74–111.

Duranton, G., Gobillon, L., and Overman, H. (2011). Assessing the effects of local taxation using microgeographic data. *Economic Journal*, 121(555):1017–1046.

Eckert, F., Ganapati, S., and Walsh, C. (2022). Urban-biased growth. *Working Paper*.

Fajgelbaum, P., Morales, E., Serrato, J. C. S., and Zidar, O. (2019). State taxes and spatial misallocation. *Review of Economic Studies*, 86(1):333–376.

Ferreira, F. and Gyourko, J. (2009). Do political parties matter? evidence from u.s. cities. *Quarterly Journal of Economics*, 124(1):399–422.

Freeman, R. (1986). Unionism comes to the public sector. *Journal of Economic Perspectives*, 24(1):41–86.

Freeman, R. (1988). Contraction and expansion: The divergence of private sector and public sector unionism in the united states. *Journal of Economic Perspectives*, 2(2):63–88.

Freeman, R. and Valletta, R. (1988). *Appendix B: The NBER Public Sector Collective Bargaining Law Data Set*, pages 399–420. University of Chicago Press.

Ganong, P. and Shoag, D. (2017). Why has regional income convergence in the U.S. declined? *Journal of Urban Economics*, 102:76–90.

Giannone, E. (2019). Skill-biased technical change and regional convergence. *Working paper*.

Giroud, X. and Rauh, J. (2019). State taxation and the reallocation of business activity: Evidence from establishment-level data. *Journal of Political Economy*, 127(3):1262–1316.

Gyourko, J., Mayer, C., and Sinai, T. (2013). Superstar cities. *American Economic Journal: Economic Policy*, 5(4):167–199.

Haughwout, A., Inman, R., Craig, S., , and Luce, T. (2004). Local revenue hills: Evidence from four u.s. cities. *Review of Economics and Statistics*, 86(2):570–85.

Hoxby, C. (1999). The productivity of schools and other local public goods producers. *Journal of Public Economics*, 74(1):288–317.

Hsieh, C.-t. and Moretti, E. (2019). Housing constraints and spatial misallocation. *American Economic Journal: Macroeconomics*, 11(2):1–39.

Kahn, M. (2017). Is local public sector rent extraction higher in progressive cities or high amenity cities? *NBER Working Paper*, 23201.

Kaplan, J. (2021). United states governors 1775-2020. ann arbor, mi: Inter-university consortium for political and social research [distributor].

Kopelman, J. and Rosen, H. (2016). Are public sector jobs recession-proof? were they ever? *Public Finance Review*, 44(3):370–396.

Lee, S., Lee, S. H., and Jeffrey, L. (2019). The well-being of nations: Estimating welfare from international migration. *Working Paper*.

Leip, D. (2023). Dave leip's atlas of u. s. presidential elections.

Lyytikainen, T. (2012). Tax competition among local governments: Evidence from a property tax reform in finland. *Journal of Public Economics*, 96(7–8):584–595.

Mast, E. (2020). Race to the bottom? local tax break competition and business location. *American Economic Journal: Applied Economics*, 12(1):288–317.

Moretti, E. (2004). Workers' education, spillovers, and productivity: Evidence from plant-level production functions. *American Economic Review*, 94(3):656–690.

Moretti, E. (2013). Real wage inequality. *American Economic Journal: Applied Economics*, 5(1):65–103.

Moretti, E. and Wilson, D. (2017). The effect of state taxes on the geographical location of top earners: Evidence from star scientists. *American Economic Review*, 107(7):1858–1903.

Niskanen, W. (1968). The peculiar economics of bureaucracy. *American Economic Review*, 58(2):293–305.

Oates, W. (1999). An essay on fiscal federalism. *Journal of Economic Literature*, 37(3):1120–1149.

Pierson, K., Hand, M., and Thompson, F. (2015). The government finance database: A common resource for quantitative research in public financial analysis. *PLoS ONE*, 10(6):e0130119.

Saiz, A. (2010). The geographic determinants of housing supply. *Quarterly Journal of Economics*, 125(3):1253–1296.

Tiebout, C. (1956). A pure theory of local expenditures. *Journal of Political Economy*, 64(5):416–424.

Wilson, J. (1986). A theory of interregional tax competition. *Journal of Urban Economics*, 19(3):296–315.

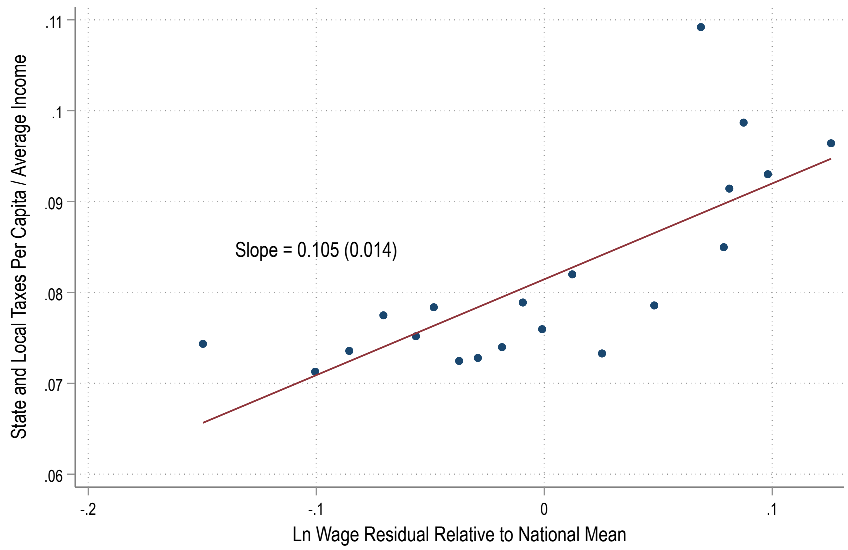
Wilson, J. (1999). Theories of tax competition. *National Tax Journal*, 52(2):269–304.

Young, C. and Varner, C. (2011). Millionaire migration and state taxation of top incomes: Evidence from a natural experiment. *National Tax Journal*, 64(2.1):255–84.

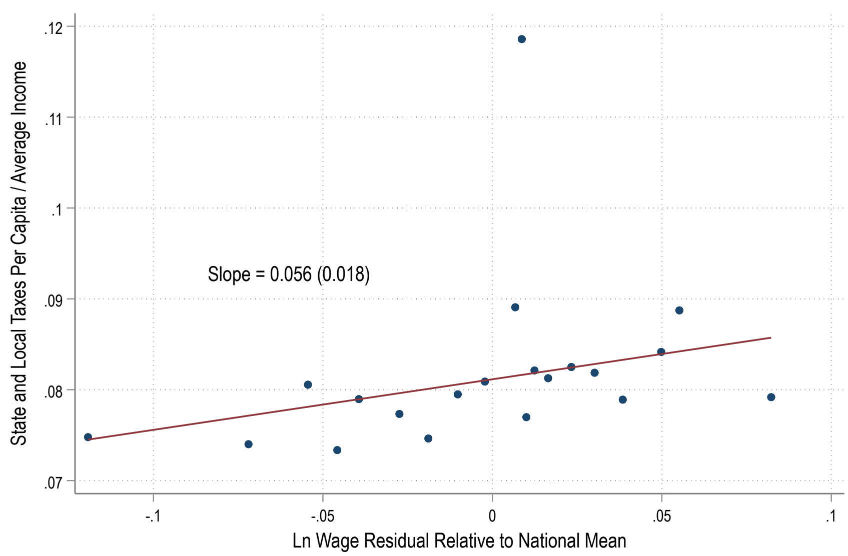
Zidar, O. and Serrato, J. C. S. (2016). Who benefits from state corporate tax cuts? a local labor market approach with heterogeneous firms. *American Economic Review*, 106(9):2582–2624.

Zodrow, G. and Mieszkowski, P. (1986). Pigou, tiebout, property taxation, and the underprovision of local public goods. *Journal of Urban Economics*, 19:356–370.

Figure 1: Per Capita Tax-to-Income Ratio Against State Wage Residual



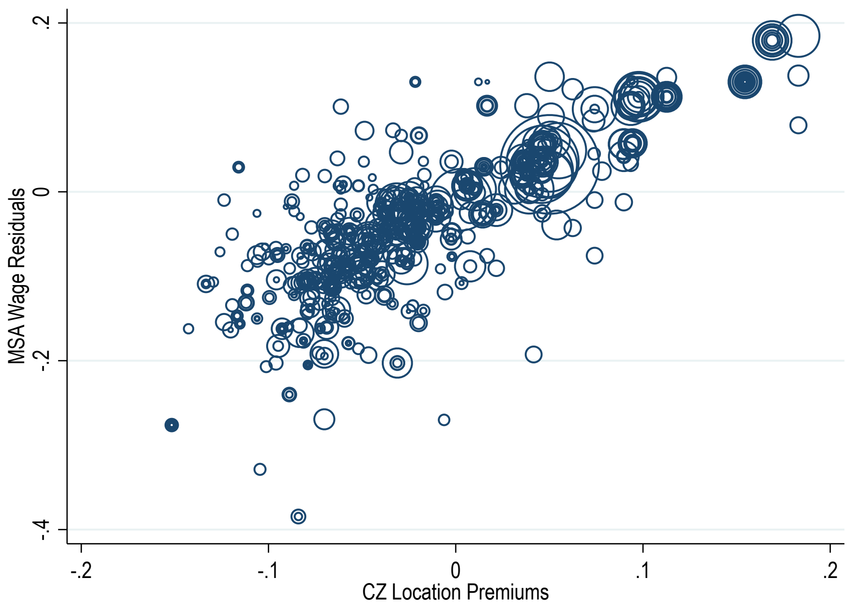
(a) Controls: Year FE



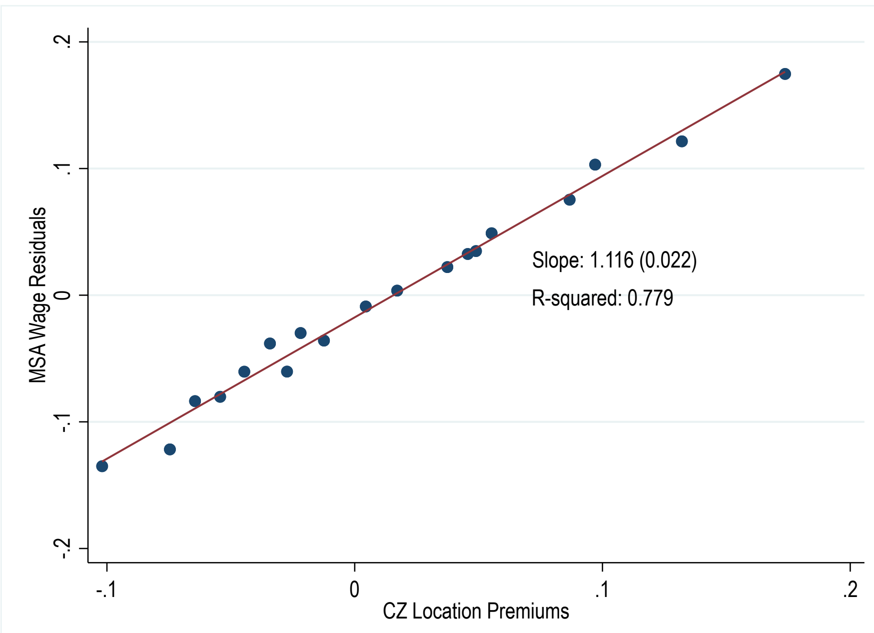
(b) Controls: Year FE and State Characteristics

Note: This figure presents binned scatter plots of the ratio of state-level total taxes per capita (from both state and local governments) to the state-level average income, plotted against each state's log wage residual relative to the national mean. Tax revenue is from the Annual Survey of State and Local Government Finances for 1987, 1997, 2007, and 2017. Average income and log wage residuals are estimated using the CPS ASEC data, pooled over the periods 1977–1989, 1990–1999, 2000–2009, and 2010–2019. The sample includes full-time private-sector workers aged 25–65. Log wage residuals are estimated separately for each period, controlling for dummies for workers' age, race, Hispanic origin, education, sex, marital status, occupation code, and industry code. We control for year fixed effects for both figures. In Figure 1b, we further control for: (i) college share (as a proxy for public goods preferences), (ii) natural amenities (including proximity to lakes or seashores, average January and July temperatures, and annual precipitation), (iii) political preferences (including Democratic and Republican vote shares, and the state governors' party affiliation), (iv) land unavailability; and (v) the number of counties in each state (as a proxy for competition among local governments).

Figure 2: Correlation between CZ Wage Premiums and MSA Wage Residuals



(a) Scatter Plot



(b) Binned Scatter Plot

Note: The figure illustrates the relationship between our two productivity measures—estimated log wage residuals across MSAs from the CPS and log earnings premiums across CZs from Card et al. (2025). In Panel (a), each observation is a county. The x-axis shows the log earnings premium of the CZ containing the county, and the y-axis shows the log wage residual of the MSA containing the county (estimated using pooled CPS data from 2010–2019). The scatter plot is weighted by county population and reveals a strong positive relationship between the two measures. Panel (b) presents the corresponding binned scatter plot, where the slope of the fitted line is 1.116 and the estimate is statistically significant; the R-squared is 0.779.

Table 1: Summary Statistics

Panel A: Annual Survey of State and Local Government Finances (1987, 1997, 2007, 2017)

	State Area: State and Local Gov			County Area: Local Gov		
	Obs.	Mean	SD	Obs.	Mean	SD
Total Taxes / Total Revenue	204	.392	.050	2942	.361	.116
Corporation Taxes / Total Taxes	204	.049	.027	2942	.002	.016
IG Transfers / Total Revenue	204	.289	.043	2942	.343	.099
Payroll Expenditure / Total Expenditure	204	.247	.044	2942	.360	.090
Tax Per Capita / Income	204	.081	.017	2942	.035	.033
Non-corporation Tax Per Capita / Income	204	.077	.016	2942	.035	.028
Non-payroll Expenditure Per Capita / Income	204	.150	.037	2942	.067	.061

Panel B: Current Population Survey (1977–2019)

	Private Sector Workers			Federal Gov Workers		
	Obs.	Mean	SD	Obs.	Mean	SD
Ln Hourly Wage	1575342	2.52	.805	92507	2.85	.648
Age	1575342	41.1	10.76	92507	42.8	10.52
Female	1575342	.423	.494	92507	.367	.482
Black	1575342	.103	.304	92507	.175	.380
Hispanic	1575342	.118	.323	92507	.074	.261
Share of Workers with High School Diploma	1575342	.232	.422	92507	.167	.373
Share of Workers with Some College	1575342	.256	.437	92507	.315	.465
Share of Workers with 4-year College or More	1575342	.279	.448	92507	.382	.486

	State Gov Workers			Local Gov Workers		
	Obs.	Mean	SD	Obs.	Mean	SD
Ln Hourly Wage	108670	2.64	.638	191149	2.62	.638
Age	108670	43.4	10.76	191149	43.32	10.53
Female	108670	.549	.498	191149	.566	.496
Black	108670	.137	.344	191149	.132	.338
Hispanic	108670	.066	.249	191149	.079	.270
Share of Workers with High School Diploma	108670	.143	.350	191149	.143	.351
Share of Workers with Some College	108670	.223	.417	191149	.212	.409
Share of Workers with 4-year College or More	108670	.526	.499	191149	.519	.500
Share of Workers under Collective Bargaining	102095	.638	.481	184535	.693	.461

Note: Panel A presents summary statistics on government revenue and expenditures from the Annual Survey of State and Local Government Finances for 1987, 1997, 2007, and 2017. The first three columns present state area summary statistics, aggregating the relevant revenue and expenditure of the state government and local governments within the state. The last three columns present county area summary statistics, aggregating the relevant revenue and expenditure of local governments within the county. Panel B presents summary statistics separately for private sector workers, federal government workers, state government workers, and local government workers in the CPS from 1977–2019. The sample is restricted to workers aged from 25–65 working at least 35 hours per week, having positive wage income, and whose wages are not imputed. The hourly wages are deflated by the CPI from use CPS and reported in real 1999 dollars. We match the CPS data with public sector collective bargaining laws by state and year to construct a dummy for whether collective bargaining is allowed for state or local government workers.

Table 2: State and Local Government Finances

Variables	Ln (Total Tax Rev Pc / Income) (1)	Ln (Non-Corp Tax Pc / Income) (2)	Ln (Non-Tax Rev Pc / Income) (3)	Ln (Non-Payroll Exp Pc / Income) (4)
Panel A: State Area Regressions (State and Local Governments)				
Ln State Wage Res	1.194***	1.109***	0.0546	0.527
	(0.346)	(0.328)	(0.631)	(0.522)
Observations	204	204	204	204
R-squared	0.358	0.358	0.310	0.386
Panel B: County Area Regressions (Local Governments)				
Ln MSA Wage Res	1.304***	1.276***	-0.901***	-0.0547
	(0.195)	(0.185)	(0.195)	(0.189)
Observations	2,942	2,942	2,942	2,938
R-squared	0.510	0.514	0.458	0.441

Note: Panel A presents state-level regression results, where each observation is a state-year cell. The dependent variable includes the log ratio of total tax revenue per capita to average income, log ratio of non-corporate tax revenue per capita to average income, log ratio of total non-tax revenue per capital to average income, and log ratio of total non-payroll expenditure per capita to average income. Government revenue and expenditure are those of both state and local governments, aggregated at the state level, using data from the Annual Survey of State and Local Government Finances for 1987, 1997, 2007, and 2017. Average income is estimated from CPS ASEC, pooling data from 1977–1989, 1990–1999, 2000-2009, and 2010–2019 to match with government survey years. The key regressor is the state-level log wage residual, estimated using full-time private-sector workers aged 25–65 from CPS ASEC, controlling for dummies for workers' age, sex, race, Hispanic origin, marital status, education, occupation, and industry. Regressions are weighted by state population. Panel B presents county-level regression results, where each observation is a county-year. The dependent variable is defined as in Panel A, but government revenue and expenditure are those of local governments, aggregated at the county level. The key regressor is the log wage residual of the MSA containing the county. Regressions are weighted by county population. Standard errors are clustered at the state level for panel A and MSA level for panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.

Table 3: Relationship between Public Goods and Productivity

Variables	Ln Share of Acceptable Roads		Ln Teacher-Student Ratio		Ln Number of Hospital Beds per 100,000	
	(1)	(2)	(3)	(4)	(5)	(6)
Ln Wage Res	-1.407***	-1.051**	-0.147***	-0.142***	-0.768**	-0.424
	(0.349)	(0.419)	(0.0437)	(0.0443)	(0.312)	(0.427)
Observations	152	138	2,819	2,634	669	630
R-squared	0.304	0.534	0.798	0.792	0.130	0.155
State FE	No	No	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
College Share, Amenities, Politics, Housing Supply, and Number of Counties	No	Yes	No	Yes	No	Yes

Variables	Ln Arrest Rate		Ln Fire Dept. Response Time	
	(7)	(8)	(9)	(10)
Ln Wage Res	-0.418**	-0.0384	0.318	1.832***
	(0.185)	(0.214)	(0.320)	(0.700)
Observations	2,774	2,588	2,227	2,083
R-squared	0.380	0.401	0.224	0.260
State FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
College Share, Amenities, Politices, Housing Supply, and Number of Counties	No	Yes	No	Yes

Note: The dependent variable includes log percent of acceptable road condition by state for 1997, 2007, and 2017 in columns 1–2, log teacher-student ratio by county for 1987, 1997, 2007, and 2017 in columns 3–4, log number of hospital beds per 100,000 by county for 2000 in columns 5–6, log arrest rate by county for 1987, 1997, 2007, and 2017 in columns 7–8, and log average fire department response time (in minutes) by county for 1987, 1997, 2007, and 2017 in columns 9–10. Each observation corresponds to a state-year cell in columns 1–2 and a county-year cell in other columns. The key regressor is the state-level log wage residual in columns 1–2 and MSA-level log wage residual in columns 3–10. Log wage residuals are estimated by controlling for dummies for workers' age, sex, race, Hispanic origin, marital status, education, occupation, and industry, aggregated at the state or MSA level. Columns in even numbers further control for state- or MSA-level characteristics, including college share, proximity to lakes or seashores, average of January and July temperatures, annual precipitation, land unavailability, Democratic and Republican vote shares, the state governors' party affiliation, and the number of counties within each state or MSA. Standard errors are clustered at the state level in columns 1–2 and the MSA level in columns 3–10. *** $p <$ 0.01, ** $p <$ 0.05, *$p <$ 0.1.

Table 4: Public-Private Sector Wage Gap

Panel A: Across-State Wage Premiums

Variable	Ln Wage	
	(1)	(2)
Ln State Wage Res	1.153***	1.198***
	(0.0820)	(0.0791)
Gov × Ln State Wage Res	0.416***	-0.356**
	(0.113)	(0.140)
Definition of "Gov"	State	Federal
Observations	1,683,994	1,667,836
R-squared	0.360	0.365

Panel B: Across-MSA Wage Premiums

Variable	Ln Wage				
	(1)	(2)	(3)	(4)	(5)
Ln MSA Wage Res	0.952***	0.982***	0.958***	1.023***	1.016***
	(0.0334)	(0.0273)	(0.0779)	(0.0264)	(0.0280)
Gov × Ln MSA Wage Res	0.186*	-0.263***	-0.504***	-0.746***	-0.298*
	(0.110)	(0.0938)	(0.193)	(0.0674)	(0.163)
Gov × Ln MSA Wage Res × z^{tax}			1.195*		
			(0.711)		
Ln State Wage Res		0.00125	-0.0497	0.0394	0.0566
		(0.0570)	(0.124)	(0.0490)	(0.0507)
Gov × Ln State Wage Res		0.884***	0.406*	1.249***	-0.104
		(0.129)	(0.245)	(0.106)	(0.0978)
Gov × Ln State Wage Res × z^{trans}			1.188*		
			(0.688)		
Definition of "Gov"	Local	Local	Local	State	Federal
Observations	1,202,137	1,202,137	1,146,471	1,145,621	1,146,901
R-squared	0.372	0.372	0.373	0.373	0.377

Note: The sample consists of workers aged 25–65 working at least 35 hours per week from the CPS ASEC from 1977–2019. The data are pooled into four periods: 1977–1989, 1990–1999, 2000-2009, and 2010–2019. Each column restricts the sample to private-sector workers and government workers—the type of government workers included in the sample is specified in each column. *Gov* is an indicator for corresponding government workers. Log wage residuals are estimated by controlling for dummies for workers' age, sex, race, Hispanic origin, marital status, education, occupation, and industry, aggregated at the state or MSA level. z^{tax} and z^{trans} are the fractions of local government revenue within an MSA derived from taxes and state transfers, respectively. All regressions control for dummies for age, sex race, Hispanic origin, marital status, education, and the interaction between *Gov* and occupation. All regressions are weighted using the CPS ASEC earnings weights. Standard errors are clustered at the state level in Panel A and MSA level in Panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.

Table 5: Public-Private Sector Wage Gap and Collective Bargaining Legality

Panel A: Across-State Wage Premiums			
Variable	Ln Wage		
	(1)	(2)	
Gov × Ln State Wage Res	-0.167*	0.0212	
	(0.0935)	(0.193)	
Gov × Collective Barg × Ln State Wage Res	0.633***	-0.485**	
	(0.148)	(0.233)	
Definition of "Gov"	State	Federal	
Observations	1,624,773	1,603,020	
R-squared	0.361	0.365	
Panel B: Across-MSA Wage Premiums			
Variable	Ln Wage		
	(1)	(2)	(3)
Gov × Ln MSA Wage Res	-0.157	-0.601***	-0.128
	(0.151)	(0.0958)	(0.153)
Gov × Collective Barg × Ln MSA Wage Res	0.305*	-0.213*	-0.352***
	(0.182)	(0.126)	(0.120)
Gov × Ln State Wage Res		0.415***	0.0604
		(0.109)	(0.117)
Gov × Collective Barg × Ln State Wage Res		0.989***	-0.102
		(0.159)	(0.167)
Definition of "Gov"	Local	State	Federal
Observations	1,166,564	1,110,399	1,146,901
R-squared	0.372	0.373	0.377

Note: The sample consists of workers aged 25–65 working at least 35 hours per week from the CPS ASEC from 1977–2019. The data are pooled into four periods: 1977–1989, 1990–1999, 2000-2009, and 2010–2019. Each column restricts the sample to private-sector workers and government workers—the type of government workers included in the sample is specified in each column. *Gov* is an indicator for corresponding government workers. Log wage residuals are estimated by controlling for dummies for workers' age, sex, race, Hispanic origin, marital status, education, occupation, and industry, aggregated at the state or MSA level. In Panel A, *Collective Barg* indicates legal collective bargaining for state government workers. In Panel B, *Collective Barg* indicates legal collective bargaining for local government workers in column 1, state government workers in column 2, and either local or state government workers in column 3. All regressions control for dummies for age, sex race, Hispanic origin, marital status, education, and the interaction between *Gov* and occupation. All regressions are weighted using the CPS ASEC earnings weights. Standard errors are clustered at the state level in Panel A and MSA level in Panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.

Table 6: State and Local Government Defined Benefit Pensions

Variables	Ln (Benefit Per Beneficiary / Income)		Ln (Gov Contribution Per Member / Income)	
	(1)	(2)	(3)	(4)
Panel A: State Area Regressions (State and Local Governments)				
Ln State Wage Res	0.969***	-0.546	2.724***	
	(0.318)	(0.993)	(0.637)	
Ln State Wage Res$_{t-10}$		1.426*		
		(0.823)		
Observations	204	153	204	
R-squared	0.460	0.287	0.295	
Panel B: County Area Regressions (Local Governments)				
Ln MSA Wage Res	-0.896	-1.231	1.580**	0.101
	(0.875)	(0.884)	(0.801)	(1.009)
Ln State Wage Res		-0.834		2.863***
		(2.099)		(1.036)
Ln MSA Wage Res$_{t-10}$	1.382*	0.511		
	(0.808)	(0.570)		
Ln State Wage Res$_{t-10}$		3.155*		
		(1.606)		
Observations	817	817	1,201	1,201
R-squared	0.113	0.188	0.214	0.245

Note: Panel A presents state-level regression results, where each observation is a state-year. The dependent variable includes the log ratio of benefit per beneficiary to average income and the log ratio of government pension contribution per member to average income. Pension benefit and government contribution are those of both state and local governments, aggregated at the state level, using data from the Annual Survey of Public Pensions for 1987, 1998, 2007, and 2017. Average income is estimated using the personal total annual income from CPS ASEC, pooling data from 1977–1989, 1990–1999, 2000–2009, and 2010–2019 to match the pension survey years. The key regressor is the state-level log wage residual, estimated using full-time private-sector workers aged 25–65 from CPS ASEC, controlling for dummies for workers' age, sex, race, Hispanic origin, marital status, education, occupation, and industry. Regressions are weighted by state-level total number of beneficiaries in columns 1–2 and state-level total number of pension members in column 3. Panel B presents the county-level regression results, where each observation is a county-year. The dependent variables are defined as in Panel A, but pension benefit and government contribution are those of local governments, aggregated at the county level. The key regressors include the MSA- and state-level log wage residuals. Regressions are weighted by county-level total number of beneficiaries in columns 1–2 and county-level total number of pension members in column 3. Standard errors are clustered at the state level in Panel A and MSA level in Panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.

Appendix

A1 Location Desirability and Migration Elasticity: Example

Our model predicts that an increase in the relative desirability of location j lowers the migration elasticity in j. To provide intuition, we present a graphical illustration. For simplicity, we group all other locations outside of j as "elsewhere" or $-j$ and assume that location j is small such that the wage and rent changes in j do not affect the aggregate wage and rent in "elsewhere" $-j$. Without loss of generality, assume that the preference dispersion parameter $\sigma = 1$. Therefore, a worker chooses location j if

$$\bar{U}_j + \varepsilon_{ij} > \bar{U}_{-j} + \varepsilon_{i,-j} \iff$$
$$\varepsilon_{ij} - \varepsilon_{i,-j} > \bar{U}_{-j} - \bar{U}_j.$$

Since ε_{ij} and $\varepsilon_{i,-j}$ come from a Type-I Extreme Value distribution, $\varepsilon_{ij} - \varepsilon_{i,-j}$ follows a Logistic distribution, centered at 0. Thus, the mass of residents choosing j is represented by the areas under the probability density function function f on the right of the cutoff value $\bar{U}_{-j} - \bar{U}_j$, as shown in Figure A1. The number of marginal movers can be represented by $f(\bar{U}_{-j} - \bar{U}_j)$. A small increase in the tax rate will cause a slight shift to the right in the utility cutoff, leading the marginal movers to relocate away from j. The key intuition for the migration elasticity $\varepsilon_{L,\tau,j}$ is that it depends on the number of the marginal movers relative to the number of existing residents. The fraction could be represented by the hazard function: $H = \frac{f}{1-F}$, where F is the cumulative density function. The lower panel of Figure A1 plots H.

If location j becomes more desirable, either because of higher wages or more desirable amenities, the cutoff value will shift to the left (from $\bar{U}_{-j} - \bar{U}_j$ to $\bar{U}_{-j} - \bar{U}'_j$), leading to an increase in the population in j. Although the number of marginal movers increases in this case (upper panel), the size of marginal movers as a *fraction* of existing residents in j decreases (lower panel).[16] Therefore, increasing desirability of location j could lower the migration elasticity in j.

[16]It is worth noting that whether the size of marginal movers increases or decreases as a result of increasing desirability of j (or $\bar{U}_j$) is not determined, depending on the value of $\bar{U}_{-j} - \bar{U}_j$. However, it can be shown that H is an increasing function. Thus, increasing desirability of j will always lower the number of marginal movers as a fraction of current residents.

A2 Model Setup: Property Tax Regime

Our baseline model assumes that taxes are levied through income taxation. In this section, we show that this framework can be generalized by analyzing an alternative setting in which taxes are levied through property taxes instead. Specifically, in each location j, the local government collects property taxes from residents at a rate τ_j and provides public goods at a cost of g_j per capita to all residents in j. The profit that the government can extract is

$$\pi_j = \tau_j \alpha R_j L_j - g_j L_j,$$

where α is the price-rent ratio, and R_j is the rental price. The tax rate τ_j is the fraction of a property's value collected as property tax. The government maximizes profit by choosing the property tax rate τ_j and public goods provision g_j. Taking first-order conditions (FOCs), we obtain

$$\alpha R_j L_j + \tau_j \alpha \left(\frac{\partial R_j}{\partial \tau_j} L_j + R_j \frac{\partial L_j}{\partial \tau_j} \right) - g_j \frac{\partial L_j}{\partial \tau_j} = 0;$$

$$\tau_j \alpha \left(\frac{\partial R_j}{\partial g_j} L_j + R_j \frac{\partial L_j}{\partial g_j} \right) - L_j - g_j \frac{\partial L_j}{\partial g_j} = 0.$$

A2.1 Tax Markup

The first FOC condition can be rewritten as

$$1 + \frac{\partial R_j}{\partial \tau_j} \frac{\tau_j}{R_j} + \frac{\partial L_j}{\partial \tau_j} \frac{\tau_j}{L_j} - \frac{g_j}{\alpha R_j \tau_j} \frac{\partial L_j}{\partial \tau_j} \frac{\tau_j}{L_j} = 0.$$

Define $s_j = \frac{g_j}{\alpha R_j}$, representing per-resident cost of local public goods provision as a fraction of local property value. We can further rewrite the above FOC as follows:

$$1 + \varepsilon_{R,\tau,j} + \varepsilon_{L,\tau,j} - \frac{s_j}{\tau_j} \varepsilon_{L,\tau,j} = 0,$$

where $\varepsilon_{L,\tau,j}$ is the local population elasticity with respect to the property tax rate and $\varepsilon_{R,\tau,j}$ is the local rent elasticity with respect to the property tax rate. Rearranging the expression, we obtain

$$\frac{\tau_j - s_j}{\tau_j} = -\frac{1 - \varepsilon_{R,\tau,j}}{\varepsilon_{L,\tau,j}}.$$

The result closely mirrors the baseline model: the tax markup decreases as the absolute value of the population elasticity with respect to tax rate increases. In addition to migration elasticity, the sensitivity of local rents to taxes can further constrain governments' ability to extract rents.

A3 Model Setup: The Baumol Effect

A3.1 Free Labor Mobility Between Public and Private Sectors

We construct an alternative setup for the public sector to illustrate that under certain conditions, benevolent local governments could still give rise to a spatial correlation between local productivity and local tax rate.

To facilitate the derivation of government-sector labor demand, we assume decreasing returns to scale in the government production function, which takes the following form:

$$G_j = \alpha_j L_{j,g}^{\lambda},$$

where $L_{j,g}$ is the number of government workers in location j and $\lambda < 1$. The conclusion holds if we set $\lambda = 1$.

As in our baseline model, the private sector has a linear production function:

$$Y_j = \theta_j L_{j,-g},$$

where $L_{j,-g}$ is number of private-sector workers. The FOC for the private sector implies that the wage is equal to marginal productivity:

$$W_j = \theta_j.$$

Since labor is freely mobile between sectors, the wage for government workers in location j should be the same.

In the government sector, let p_j denote the equilibrium price of local public goods. Since the government is benevolent, they do not make any profit. Therefore, the cost of producing public goods equal the revenue:

$$W_j L_{j,g} = p_j \alpha_j L_{j,g}^{\lambda},$$

which results in

$$L_{j,g} = \left(\frac{p_j \alpha_j}{\theta_j}\right)^{\frac{1}{1-\lambda}}.$$

Thus, the supply of local public goods is

$$G_j = \alpha_j \left(\frac{p_j \alpha_j}{\theta_j}\right)^{\frac{\lambda}{1-\lambda}}.$$

To capture the key features of the Baumol effect, we assume that demand for public goods is income-elastic and price-inelastic:

$$G_j^d = L_j W_j^b p_j^{-\varepsilon}$$

where $b > 1$ and ε is very small.

Equating supply and demand of public goods, we can solve for p_j:

$$p_j = \left(\frac{L_j \theta_j^b}{\alpha_j}\right)^{\frac{1-\lambda}{\lambda+\varepsilon(1-\lambda)}} \left(\frac{\theta_j}{\alpha_j}\right)^{\frac{\lambda}{\lambda+\varepsilon(1-\lambda)}}.$$

As $\varepsilon \to 0$, the market value of public goods becomes

$$p_j G_j = C L_j^{\frac{1}{\lambda}} \theta_j^{\frac{b}{\lambda}+1},$$

where C is a constant. Thus, under a benevolent government without rent-seeking motives, total expenditure on public goods as a fraction of local income (i.e., the tax rate) increases with local productivity θ_j:

$$\tau_j^{benev} = C L_j^{\frac{1-\lambda}{\lambda}} \theta_j^{\frac{b}{\lambda}}$$

This reflects the classical Baumol effect: under free mobility, income-elastic and price-inelastic demand for public goods leads to larger and more costly public sectors in locations with higher private-sector productivity.

A3.2 Restricted Labor Mobility Between Private and Public Sectors

Since the public-private wage gap is rarely zero and often positive, it is important to consider the possibility that government employment might not be fully mobile. Prior research suggests that government jobs tend to be more stable and public-sector hiring is less flexible (Kopelman and Rosen, 2016).

Under the assumption of income-elastic and price-inelastic demand for public goods, if labor mobility between the public and private sectors is restricted, higher productivity in the private sector may lead to not only higher spending on public goods but also a larger public-private wage gap, without any rent-seeking on the part of the government. We demonstrate this below.

We retain all assumptions from the previous subsection, except that public-sector labor supply is now fixed at $\bar{L}_{j,g}$ and does not adjust with local productivity θ_j. With restricted labor mobility, wages are no longer equalized across sectors. Let $W_{j,-g}$ and $W_{j,g}$ denote wages in the private and public sectors, respectively.

Private-sector wages remain determined by marginal productivity:

$$W_{j,-g} = \theta_j.$$

In contrast, public-sector wages must satisfy the zero-profit condition under a benevolent government. The profit from public goods production is

$$p_j \alpha_j \bar{L}_{j,g}^{\lambda} - W_{j,g} \bar{L}_{j,g} = 0.$$

The equation yields government-sector wages:

$$W_{j,g} = p_j \alpha_j \bar{L}_{j,g}^{\lambda-1}.$$

Because labor supply in the public sector is fixed, the provision of public goods is also fixed:

$$G_j = \alpha_j \bar{L}_{j,g}^{\lambda}$$

Assuming, as before, that demand for local public goods is income-elastic and price-inelastic, we write the demand function as follows:

$$G_j^d = L_j W_j^b p_j^{-\varepsilon}$$

To make the result analytically presentable, we assume that the demand for public goods primarily comes from private-sector workers (state and local government workers constitute less than 15% of the total workforce in the U.S.) – i.e., $\frac{\bar{L}_{j,-g}}{L_j} \approx 1$ in this case:

$$G_j^d = L_j \left(\frac{\bar{L}_{j,-g}}{L_j} W_{j,-g}^b + \frac{\bar{L}_{j,g}}{L_j} W_{j,g}^b \right) p_j^{-\varepsilon} \approx L_j W_{j,-g}^b p_j^{-\varepsilon}.$$

The market clearing condition $G_j^d = G_j$ yields the price of public goods:

$$p_j = \left(\frac{L_j W_{j,-g}^b}{\alpha_j \bar{L}_{g,j}^{\lambda}} \right)^{\frac{1}{\varepsilon}}.$$

Substituting into the public-sector wage equation above gives

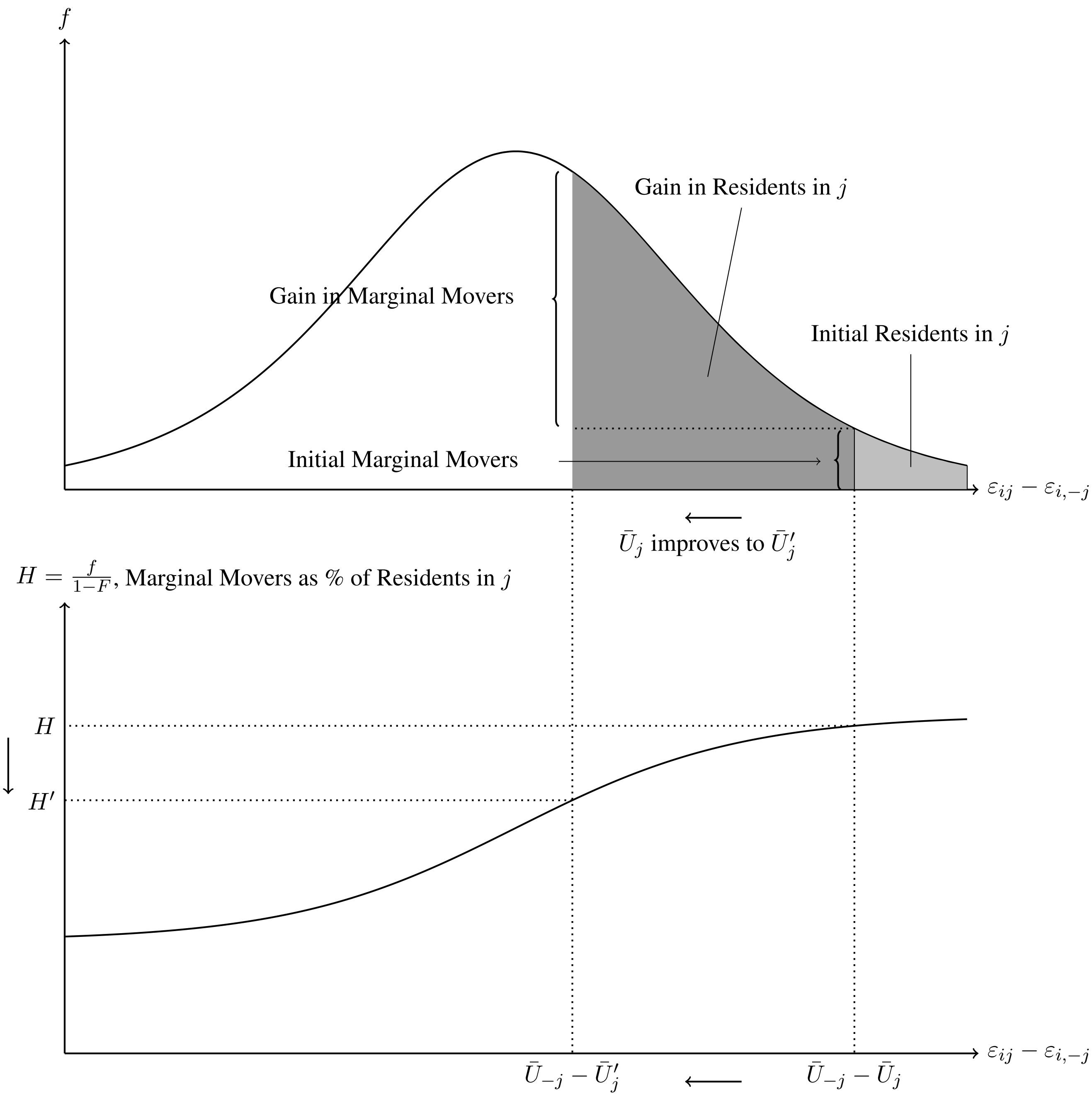
$$W_{j,g} = \alpha_j \left(\frac{L_j W_{j,-g}^b}{\alpha_j \bar{L}_{j,g}^{\lambda}} \right)^{\frac{1}{\varepsilon}} \bar{L}_{j,g}^{\lambda-1}.$$

Thus, the public-private wage gap is

$$\frac{W_{j,g}}{W_{j,-g}} = \alpha_j \left(\frac{L_j}{\alpha_j \bar{L}_{j,g}} \right)^{\frac{1}{\varepsilon}} \bar{L}_{j,g}^{\lambda-1} \theta_j^{\frac{b}{\varepsilon}-1}$$

Thus, if ε is sufficiently small (i.e., $\varepsilon < b$), the public-private wage gap increases with local productivity θ, even in the absence of government rent-seeking.

Figure A1: Location Preferences and Marginal Movers



Note: The first plot is an analytical representation of a logistic distribution for $\varepsilon_{ij} - \varepsilon_{i,-j}$. We use to figure to show how the population of j and the number of marginal movers between j and $-j$ would change if the mean utility of j increases from $\bar{U}_j$ to $\bar{U}'_j$. The area shaded in light grey represents the initial population of j. The area shaded in dark grey is the population that j would gain when the mean utility of j improves. The values of the PDF function at the cutoffs are the number of marginal movers in each scenario. The second plot is the corresponding number of the marginal movers as a fraction of the total population in j—the PDF function divided by one minus the CDF function.

Table A1: State and Local Government Finances:
Using Location Premiums from Card et al. (2025)

Variables	Ln (Total Tax Rev Pc / Income) (1)	Ln (Non-Corp Tax Pc / Income) (2)	Ln (Non-Tax Rev Pc / Income) (3)	Ln (Non-Payroll Exp Pc / Income) (4)
Panel A: State Area Regressions (State and Local Governments)				
Ln State Premium	1.517***	1.440***	0.215	0.758
	(0.412)	(0.389)	(0.848)	(0.666)
Observations	196	196	196	196
R-squared	0.410	0.417	0.334	0.427
Panel B: County Area Regressions (Local Governments)				
Ln CZ Premium	2.816***	2.756***	-0.984**	0.590
	(0.477)	(0.455)	(0.426)	(0.460)
Observations	2,939	2,939	2,939	2,935
R-squared	0.540	0.544	0.449	0.444

Note: This table replicates Table 2, but uses earnings premiums from Card et al. (2025) instead. Panel A presents state-level regression results, where each observation is a state-year. The dependent variable includes the log ratio of total tax revenue per capita to average income, log ratio of non-corporate tax revenue per capita to average income, log ratio of total non-tax revenue per capital to average income, and log ratio of total non-payroll expenditure per capita to average income. Government revenue and expenditure are those of both state and local governments, aggregated at the state level, using data from the Annual Survey of State and Local Government Finances for 1987, 1997, 2007, and 2017. Average income is estimated from CPS ASEC, pooling data from 1977–1989, 1990–1999, 2000-2009, and 2010–2019 to match with government survey years. The key regressor is the state-level log earnings premium, calculated as the population-weighted average of CZ-level earnings premiums from Card et al. (2025) across all CZs within the state. Regressions are weighted by state population. Panel B presents county-level regression results, where each observation is a county-year. The dependent variables are defined as in Panel A, but government revenue and expenditure are those of local governments, aggregated at the county level. The key regressor is the log earnings premium of the CZ in which the county is located. Regressions are weighted by county population. Standard errors are clustered at the state level for panel A and CZ level for panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.

Table A2: State and Local Government Finances: Robustness Checks

Variables	Ln (Total Tax Revenue Pc / Income)					
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A: State Area Regressions (State and Local Governments)						
Ln State Wage Res	1.194***	0.656*	0.660*			
	(0.346)	(0.330)	(0.365)			
Ln State Premium				1.517***	1.183**	1.699***
				(0.412)	(0.455)	(0.626)
Observations	204	185	161	196	185	161
R-squared	0.358	0.496	0.506	0.410	0.515	0.543
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
% College, Amenities, Politics, Housing Supply, and # of Counties	No	Yes	Yes	No	Yes	Yes
Sample of States	All	All	w/ Inc. Tax	All	All	w/ Inc. Tax
Panel B: County Area Regressions (Local Governments)						
Ln MSA Wage Res	1.304***	0.720***	0.702***			
	(0.195)	(0.143)	(0.172)			
Ln CZ Premium				2.816***	3.072***	3.073***
				(0.477)	(0.589)	(0.589)
Observations	2,942	2,738	2,419	2,939	2,738	2,419
R-squared	0.510	0.521	0.528	0.540	0.539	0.544
Year FE, State FE	Yes	Yes	Yes	Yes	Yes	Yes
% College, Amenities, Polities, Housing Supply, and # of Counties	No	Yes	Yes	No	Yes	Yes
Sample of States	All	All	w/ Inc. Tax	All	All	w/ Inc. Tax

Note: This table presents robustness checks for the main results in Tables 2 and A1. Panel A presents state-level regressions, where each observation is a state-year. The dependent variable is the log ratio of total tax revenue per capita to average income. The key regressor is the state-level log wage residual in Columns 1–3 and the state-level log earnings premium from Card et al. (2025) in Columns 4–6. Columns 1 and 4 reproduce estimates from Panel A, Column 1 of Tables 2 and A1, respectively. Columns 2 and 5 add controls for state-level characteristics, including college share, proximity to lakes or seashores, average of January and July temperatures, annual precipitation, land unavailability, Democratic and Republican vote shares, state governor's party affiliation, and the number of counties within each state. Columns 3 and 6 further exclude states without state income taxes. Panel B presents county-level regressions, where each observation is a county-year. The key regressor is the MSA-level log wage residual in Columns 1–3 and the CZ-level log earnings premium from Card et al. (2025) in Columns 4–6. Columns 1 and 4 replicate estimates from Panel B, Column 1 of Tables 2 and A1, respectively. Columns 2 and 5 add controls for MSA- or CZ-level characteristics. Columns 3 and 6 further exclude states without state income taxes. Standard errors are clustered at the state level in Panel A and MSA level (Columns 1–3) or CZ level (Columns 4–6) in Panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.

Table A3: Public-Private Sector Wage Gaps:
Using Location Premiums from Card et al. (2025)

Panel A: Across-State Wage Premiums		
Variable	Ln Wage	
	(1)	(2)
Ln State Premium	1.165***	1.169***
	(0.0855)	(0.0852)
Gov × Ln State Premium	0.620***	-0.410*
	(0.161)	(0.230)
Definition of "Gov"	State	Federal
Observations	1,645,561	1,623,735
R-squared	0.358	0.362

Panel B: Across-CZ Wage Premiums					
Variable	Ln Wage				
	(1)	(2)	(3)	(4)	(5)
Ln CZ Premium	1.326***	1.377***	1.575***	1.382***	1.382***
	(0.0759)	(0.0711)	(0.239)	(0.0705)	(0.0762)
Gov × Ln CZ Premium	0.186*	-0.0107	0.0314	-0.677***	-0.329
	(0.110)	(0.207)	(0.360)	(0.148)	(0.317)
Gov × Ln CZ Premium × z^{tax}			0.559		
			(1.152)		
Gov × Ln State Premium		0.776***	-0.846	1.345***	-0.0478
		(0.276)	(0.743)	(0.189)	(0.211)
Gov × Ln State Premium × z^{trans}			4.749**		
			(2.053)		
Definition of "Gov"	Local	Local	Local	State	Federal
Observations	434,625	434,625	434,625	416,423	413,064
R-squared	0.392	0.392	0.392	0.391	0.397

Note: This table replicates Table 4, but uses earnings premiums from Card et al. (2025) instead. The sample consists of workers aged 25–65 working at least 35 hours per week from the CPS ASEC from 1977–2019. Panel B uses data from 1995–2019 only, due to the lack of county information in the CPS before 1995 needed to match workers to CZs. Each column restricts the sample to private-sector workers and government workers—the type of government workers included in the sample is specified in each column. *Gov* is an indicator for corresponding government workers. *Ln State Premium* is the state-level log earnings premium, calculated as the population-weighted average of CZ-level earnings premiums from Card et al. (2025) across all CZs within the state. *Ln CZ Premium* is the CZ-level earnings premium. z^{tax} and z^{trans} are the fractions of local government revenue within an CZ derived from taxes and state transfers, respectively. All regressions control for dummies for age, sex race, Hispanic origin, marital status, education, and the interaction between *Gov* and occupation. All regressions are weighted using the CPS ASEC earnings weights. Standard errors are clustered at the state level in Panel A and CZ level in Panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.

Table A4: Public-Private Sector Wage Gaps: Robustness Checks

Panel A: Across-State Wage Premiums						
Variable	Ln Wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Gov × Ln State Wage Res	0.416***	0.309***	0.278**			
	(0.113)	(0.108)	(0.113)			
Gov × Ln State Premium				0.620***	0.511**	0.492**
				(0.161)	(0.192)	(0.201)
Definition of "Gov"	State	State	State	State	State	State
Observations	1,683,994	1,555,073	1,293,153	1,645,561	1,555,073	1,293,153
R-squared	0.360	0.361	0.362	0.358	0.359	0.360
Year FE, State FE, Worker Char.	Yes	Yes	Yes	Yes	Yes	Yes
Gov × % College, Politics, Amenities, Housing Supply, and # of Counties	No	Yes	Yes	No	Yes	Yes
Sample of States	All	All	Inc. Tax	All	All	Inc. Tax

Panel B: Across-MSA or CZ Wage Premiums						
Variable	Ln Wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Gov × Ln MSA Wage Res × z^{tax}	1.195*	1.753***	1.793**			
	(0.711)	(0.601)	(0.714)			
Gov × Ln State Wage Res × z^{trans}	1.188*	2.768***	2.198***			
	(0.688)	(0.674)	(0.637)			
Gov × Ln CZ Premium × z^{tax}				0.559	0.487	1.047
				(1.152)	(1.064)	(1.075)
Gov × Ln State Premium × z^{trans}				4.749**	4.459**	2.996*
				(2.053)	(1.858)	(1.780)
Definition of "Gov"	Local	Local	Local	Local	Local	Local
Observations	1,146,471	1,024,218	863,310	434,625	368,792	306,976
R-squared	0.373	0.372	0.372	0.392	0.393	0.397
Year FE, MSA FE, Worker Char.	Yes	Yes	Yes	Yes	Yes	Yes
Gov × % College, Politics, Amenities, Housing Supply, and # of Counties	No	Yes	Yes	No	Yes	Yes
Sample of States	All	All	Inc. Tax	All	All	Inc. Tax

Note: This table reports robustness checks for Tables 4 and A3. The sample consists of workers aged 25–65 working at least 35 hours per week from the CPS ASEC from 1977–2019. Panel A includes state government workers and private-sector workers. *Gov* is an indicator for state government workers; *Ln State Wage Res* is the state-level log wage residual estimated using CPS; and *Ln State Premium* is the log earnings premium from Card et al. (2025). Columns 1 and 4 reproduce estimates from Panel A, Column 1 of Tables 4 and A3, respectively. Columns 2 and 5 add controls for state-level characteristics, including college share, proximity to lakes or seashores, average of January and July temperatures, annual precipitation, land unavailability, Democratic and Republican vote shares, state governor's party affiliation, and the number of counties within each state. Columns 3 and 6 exclude states without state income taxes. Panel B includes local government workers and private-sector workers. *Gov* is an indicator for local government workers; *Ln MSA Wage Res* is the MSA-level log wage residual estimated using CPS; and *Ln CZ Premium* is the CZ-level log earnings premium from Card et al. (2025). z^{tax} and z^{trans} denote the fractions of local government revenue from taxes and state transfers, respectively. Columns 1 and 4 reproduce estimates from Panel B, Column 3 of Tables 4 and A3, respectively. Columns 2 and 5 add controls for MSA- or CZ-level characteristics. Columns 3 and 6 exclude states without state income taxes. All regressions are weighted using the CPS ASEC earnings weights. Standard errors are clustered at the state level in Panel A and MSA level (Columns 1–3) or CZ level (Columns 4–6) in Panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.

Table A5: Public-Private Sector Wage Gaps and Collective Bargaining Legality: Using Location Premiums from Card et al. (2025)

Panel A: Across-State Wage Premiums		
Variable	Ln Wage	
	(1)	(2)
Gov × Ln State Premium	-0.0899	-0.175
	(0.127)	(0.139)
Gov × Collective Barg × Ln State Premium	0.743***	-0.161
	(0.201)	(0.212)
Definition of "Gov"	State	Federal
Observations	1,624,773	1,603,020
R-squared	0.359	0.363

Panel B: Across-CZ Wage Premiums			
Variable		Ln Wage	
	(1)	(2)	(3)
Gov × Ln CZ Premium	0.0609	-0.475*	0.0205
	(0.135)	(0.271)	(0.173)
Gov × Collective Barg × Ln CZ Premium	0.476**	-0.293	-0.960***
	(0.213)	(0.330)	(0.291)
Gov × Ln State Premium		0.350	-0.00468
		(0.422)	(0.398)
Gov × Collective Barg × Ln State Premium		1.117**	0.588
		(0.476)	(0.511)
Definition of "Gov"	Local	State	Federal
Observations	424,896	405,727	413,064
R-squared	0.392	0.392	0.397

Note: This table replicates Table 5, but uses earnings premiums from Card et al. (2025) instead. The sample consists of workers aged 25–65 working at least 35 hours per week from the CPS ASEC from 1977–2019. Panel B uses data from 1995-–2019 only, due to the lack of county information in the CPS before 1995 needed to match workers to CZs. Each column restricts the sample to private-sector workers and government workers—the type of government workers included in the sample is specified in each column. *Gov* is an indicator for corresponding government workers. *Ln State Premium* is the state-level log earnings premium, calculated as the population-weighted average of CZ-level earnings premiums from Card et al. (2025) across all CZs within the state. *Ln CZ Premium* is the CZ-level log earnings premium. In Panel A, *Collective Barg* indicates legal collective bargaining for state government workers. In Panel B, *Collective Barg* indicates legal collective bargaining for local government workers in Column 1, state government workers in Column 2, and either local or state government workers in Column 3. All regressions control for dummies for age, sex race, Hispanic origin, marital status, education, and the interaction between *Gov* and occupation. All regressions are weighted using the CPS ASEC earnings weights. Standard errors are clustered at the state level in Panel A and CZ level in Panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.

Table A6: Public-Private Sector Wage Gaps and Collective Bargaining Legality: Robustness Checks

Panel A: Across-State Wage Premiums						
Variable	Ln Wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Gov × Collective Barg.	0.633***	0.551***	0.478***			
× Ln State Wage Res	(0.148)	(0.139)	(0.158)			
Gov × Collective Barg.				0.743***	0.693***	0.611***
× Ln State Premium				(0.201)	(0.165)	(0.168)
Definition of "Gov"	State	State	State	State	State	State
Observations	1,624,773	1,555,073	1,293,153	1,624,773	1,555,073	1,293,153
R-squared	0.361	0.361	0.362	0.359	0.359	0.360
Year FE, State FE, Worker Char.	Yes	Yes	Yes	Yes	Yes	Yes
Gov × % College, Politics, Amenities, Housing Supply, and # of Counties	No	Yes	Yes	No	Yes	Yes
Sample of States	All	All	Inc. Tax	All	All	Inc. Tax

Panel B: Across-MSA or CZ Wage Premiums						
Variable	Ln Wage					
	(1)	(2)	(3)	(4)	(5)	(6)
Gov × Collective Barg.	0.305*	0.0950	0.116			
× Ln MSA Wage Res	(0.182)	(0.122)	(0.144)			
Gov × Collective Barg.				0.476**	0.178	0.0685
× Ln CZ Premium				(0.213)	(0.211)	(0.221)
Definition of "Gov"	Local	Local	Local	Local	Local	Local
Observations	1,166,564	1,032,663	871,755	424,896	367,345	305,529
R-squared	0.372	0.371	0.371	0.392	0.393	0.397
Year FE, MSA FE, Worker Char.	Yes	Yes	Yes	Yes	Yes	Yes
Gov × % College, Politics Amenities, Housing Supply, and # of Counties	No	Yes	Yes	No	Yes	Yes
Sample of States	All	All	Inc. Tax	All	All	Inc. Tax

Note: This table reports robustness checks for the main results in Tables 5 and A5. The sample consists of workers aged 25–65 working at least 35 hours per week from the CPS ASEC from 1977–2019. Panel B uses data from 1995-–2019 only, due to the lack of county information in the CPS before 1995 needed to match workers to CZs. Panel A restricts the sample to state government workers and private-sector workers. *Gov* is an indicator for state government workers; *Ln State Wage Res* is the state-level wage residual estimated using CPS; *Ln State Premium* is the state-level earnings premium from Card et al. (2025); and *Collective Barg* is an indicator for legal collective bargaining for state government workers. Columns 1 and 4 reproduce estimates from Panel A, Column 1 of Tables 5 and A5, respectively. Columns 2 and 5 add controls for state-level characteristics. Columns 3 and 6 exclude states without state income taxes. Panel B restricts the sample to local government workers and private-sector workers. *Gov* is an indicator for local government workers; *Ln MSA Wage Res* is the MSA-level wage residual estimated using CPS; *Ln CZ Premium* is the CZ-level earnings premium from Card et al. (2025); and *Collective Barg* is an indicator for legal collective bargaining for local government workers. Columns 1 and 4 reproduce estimates from Panel B, Column 1 of Tables 5 and A5, respectively. Columns 2 and 5 add controls for MSA- or CZ-level characteristics. Columns 3 and 6 exclude states without state income taxes. All regressions are weighted using the CPS ASEC earnings weights. Standard errors are clustered at the state level in Panel A and MSA or CZ level in Panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.

Table A7: State and Local Government Defined Benefit Pensions: Using Location Premiums from Card et al. (2025)

Variables	Ln(Benefit Per Beneficiary / Income) (1)	Ln(Gov Contribution Per Member / Income) (2)
Panel A: State Area Regressions (State and Local Governments)		
Ln State Premium	1.195**	3.149***
	(0.453)	(0.835)
Observations	196	196
R-squared	0.474	0.270
Panel B: County Area Regressions (Local Governments)		
Ln CZ Premium	-0.497	-0.0235
	(0.954)	(1.668)
Ln State Premium	2.515*	3.463**
	(1.488)	(1.722)
Observations	1,241	1,196
R-squared	0.233	0.255

Note: This table replicates Table 6, but uses earnings premiums from Card et al. (2025) instead. Panel A presents state-level regression results, where each observation is a state-year. The dependent variable includes the log ratio of benefit per beneficiary to average income and the log ratio of government pension contribution per member to average income. Pension benefit and government contribution are those of both state and local governments, aggregated at the state level, using data are from the Annual Survey of Public Pensions for 1987, 1998, 2007, and 2017. Average income is estimated using the personal total annual income from CPS ASEC, pooling data from 1977–1989, 1990–1999, 2000–2009, and 2010–2019 to match the pension survey years. The key regressor is the state-level log earnings premium, calculated as the population-weighted average of CZ-level log earnings premiums from Card et al. (2025) across all CZs within the state. Regressions are weighted by state-level number of beneficiaries in Column 1 and state-level number of pension members in Column 2. Panel B presents the county-level regression results, where each observation is a county-year. The dependent variable is defined as in Panel A, but pension benefit and government contribution are those of local governments, aggregated at the county level. The key regressors include the CZ- and state-level log earnings premiums from Card et al. (2025). Regressions are weighted by county-level number of beneficiaries in Column 1 and county-level number of pension members in Column 2. Standard errors are clustered at the state level in Panel A and CZ level in Panel B. *** $p < 0.01$, ** $p < 0.05$, *$p < 0.1$.