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Place-Based Redistribution†

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We study optimal income taxation in a spatial equilibrium model with heterogeneous locational preferences, labor supply decisions, and competitive housing and labor markets. Expressions characterizing the optimal tax schedule in each community are provided that capture the fiscal externalities associated with migration and the effects of redistribution between households and landlords. Correlation between skill and locational preferences yields optimal transfers to poor areas, while sorting based on comparative advantage can motivate transfers in either direction. A calibration to areas targeted by the US Empowerment Zone program yields sizable optimal spatial transfers that are sensitive to assumed levels of migration responsiveness. (*JEL* H21, H23, H24, J24, J31, R23)

Place-based policies tie economic benefits to geographic locations and are prevalent throughout the world (Glaeser and Gottlieb 2008; Kline and Moretti 2014b; Ehrlich and Overman 2020). The espoused rationale for such programs is often redistributive: because poor households are concentrated in certain places, targeting these areas helps the disadvantaged. However, national governments already redistribute to such households through progressive income taxes. Should poor residents of poor places receive an extra transfer based on their location?

Glaeser (2008, p. 224–5) articulates the traditional answer of economists that have studied these programs:

> "Help poor people, not poor places" … is something of a mantra for many urban and regional economists … [Place-based] aid is inefficient because it increases economic activity in less productive places and decreases economic activity in more productive places.

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In line with this efficiency-based view, most academic research on place-based policies has focused either on their efficiency costs (e.g., Glaeser and Gottlieb 2008; Albouy 2009; Austin, Glaeser, and Summers 2018; Fajgelbaum et al. 2019; Gaubert 2018) or the potential for such programs to correct market failures by internalizing productivity spillovers or other local externalities (e.g., Kline 2010; Kline and Moretti 2014a; Austin, Glaeser, and Summers 2018; Fu and Gregory 2019; Rossi-Hansberg, Sarte, and Schwartzman 2019; Fajgelbaum and Gaubert 2020). To date, however, little effort has been devoted to formalizing the redistributive goals that often motivate these policies in the first place.

In this paper, we study conditions under which place-based redistribution schemes are able to improve on the equity-efficiency tradeoffs posed by "place-blind" transfers implemented through income taxation. Our approach applies mathematical tools from the public economics literature on optimal labor income taxation to a spatial equilibrium model in the modern urban economics tradition. Residential sorting is modeled via a standard discrete choice formulation of household location decisions (McFadden 1978; Bayer, Ferreira, and McMillan 2007; Busso, Gregory, and Kline 2013; Kline and Moretti 2014b; Ahlfeldt et al. 2015) augmented to accommodate income effects. There are two locations: *Distressed* and *Elsewhere*, the latter of which may have better amenities, greater labor productivity (i.e., higher wages), and a higher cost of living. Households differ in their skill levels and in their relative tastes for the Distressed location. Each location has a competitive labor market that maps skill levels to wages. These mappings may differ from one another, generating spatial comparative advantage. Each household chooses where to live and how much to earn given the tax system, local costs of living, and local amenities. Housing is supplied by landlords, and the cost of living in each community adjusts to clear housing markets.

A utilitarian planner chooses income tax schedules in the two communities to maximize a weighted average of household utilities and landlord profits. As in classic optimal tax problems (e.g., Mirrlees 1971), we assume no market failures are present but household types are private information, with the planner observing only household earnings levels and location choices. Our analysis therefore differs fundamentally from studies considering optimal spatial transfers when household types are directly observed by the planner (e.g., Albouy 2012; Fajgelbaum and Gaubert 2020).

To develop intuition, we begin by studying the optimal choice of a lump-sum transfer to residents of Distressed financed by a head tax on residents of Elsewhere under a fixed (potentially suboptimal) income tax system. At an optimum, the equity gains of the transfer to residents of Distressed equal their corresponding efficiency costs. The optimal transfer grows large when less-skilled households are concentrated in Distressed, when few households are indifferent between the two locations, or when productivity and rent differences across areas are small. The formula highlights the earnings effects associated with migration responses as a "sufficient statistic" in the sense described by Chetty (2009) and Kleven (2021) for the efficiency costs of place-based policies, providing guidance for future empirical research on place-based transfers.

An important question left unanswered by this formula is whether spatial subsidies can improve on an optimal income tax system. The answer to this question turns out to depend crucially on the forces generating sorting of less-skilled households to Distressed. When sorting is driven by a propensity for higher-skilled households to exhibit stronger tastes for residence in Elsewhere ("skill-taste correlation") then place-based transfers will tend to be welfare improving even when taxes are set optimally. Spatial transfers can also be welfare improving when sorting is driven by locational productivity differences generating spatial comparative advantage. However, when locational preferences are homogeneous and sorting is driven entirely by income effects, the planner may find it optimal to abstain from spatial transfers, relying only on income taxes for redistribution.

This last finding mirrors classic results in public economics establishing conditions under which redistribution via differential taxation of commodities can improve welfare over and above redistribution via optimal nonlinear income taxes and transfers (Atkinson and Stiglitz 1976; Saez 2002; Ferey, Lockwood, and Taubinsky 2024). The prototypical result is that differential commodity taxation will tend to be superfluous whenever heterogeneity in consumption bundles across earnings groups is entirely attributable to income effects. As our modeling framework formalizes, place-based taxation differs from traditional commodity taxation problems in several important respects: Locational choices are discrete (nondifferentiable) decisions, they can directly affect the wage faced by households due to spatial productivity differences, and there are good reasons to expect poor households to locate in poor places for reasons besides that they are poor.

Relaxing the assumption that place-based transfers must be lump-sum, we develop general results characterizing optimal place-specific income tax schedules with unrestricted marginal tax rate (MTR) schedules. In effect, place-based redistribution can now vary by income. The differential equations characterizing these optimal MTRs resemble classic results in the optimal tax literature describing standalone economies (Mirrlees 1971; Diamond 1998; Saez 2001). However, new terms emerge capturing considerations novel to our framework. One is that raising MTRs in a location yields mobility responses that incur a fiscal externality (i.e., a change in income tax revenue) due to cost of living and productivity differences across locations. Another is that MTR changes generate equilibrium rent adjustments in both communities, which yield redistribution between households and landlords.

To study the quantitative implications of our planning framework, we solve calibrated versions of the model numerically, yielding optimal nonlinear tax schedules in each location. Complementing our theoretical analysis of a place-based head tax, we find that when sorting is generated entirely by skill-taste correlation, Distressed receives not only a larger demogrant (i.e., transfer to zero earners) but also substantially lower MTRs than Elsewhere. This finding accords with standard intuition from the literature on commodity taxation, where it has long been understood that taxing goods that high-ability households differentially prefer can improve on income taxation (Mirrlees 1976). While that literature constrains the planner to consider linear commodity taxes, the optimal spatial transfers turn out to be decidedly nonlinear in our setting.

In simulations where sorting is driven by comparative advantage, the sign of the optimal transfer to Distressed residents is found to hinge on the magnitude of migration elasticities as governed by the dispersion in idiosyncratic locational preferences. When household migration elasticities are low, the optimal tax system subsidizes

Distressed residents and yields lower MTRs in Distressed than Elsewhere at all but the highest income levels. When migration elasticities are large, the optimal tax system yields transfers to Elsewhere because fiscal externalities dominate. For intermediate household migration elasticities, it is optimal to redistribute towards Distressed at low earnings levels and towards Elsewhere at high earnings levels, highlighting the limitations of lump-sum place-based transfers. These findings complement recent work on optimal sectoral taxation that features analogous productivity differences attributable to comparative advantage but lacks cost of living differences (Scheuer 2014; Gomes, Lozachmeur, and Pavan 2018), variation in pretax incomes within location (Ales and Sleet 2022), or subnational variation in the tax schedule (Rothschild and Scheuer 2013).

Finally, in simulations where sorting is driven by income effects, small demogrants to Elsewhere are optimal accompanied by elevated MTRs in Distressed. However, as the variance of idiosyncratic locational preferences diminishes, the optimal spatial transfer approaches zero. This finding accords with theoretical results establishing that idiosyncratic preference heterogeneity violates the necessary conditions for commodity taxation to be superfluous (Kaplow 2008).

We conclude our analysis with a detailed quantitative calibration, investigating the potential magnitude and direction of optimal place-based transfers in two scenarios, both anchored by census data on the residents of the distressed areas targeted by the US Empowerment Zone (EZ) program. A first calibration attempts to capture the tradeoffs involved in the design of urban EZs, which target particular neighborhoods in large cities. A second calibration mimics the design tradeoffs of rural EZs, which target collections of rural counties. The urban scenario assumes high migration and no comparative advantage, while the rural scenario assumes low migration and substantial comparative advantage. In the urban EZ calibration, modest demogrants to targeted areas are found to be optimal, along with reductions in MTRs at lower earning levels. The net transfer turns out to be close to the magnitude of actual transfers provided by the EZ program's wage tax credits. For rural EZs, the optimal tax system involves smaller demogrants but larger reductions in MTRs, leading to sizable tax advantages for the typical zone resident.

Sensitivity analysis reveals that, in both cases, raising migration elasticities lowers the size of optimal transfers and can even reverse their sign. When sorting into rural EZs is driven by comparative advantage rather than income effects, optimal transfers grow much larger. Both these findings highlight the potential value of additional empirical research into the forces driving sorting behavior. Interestingly, placing less weight on landlord profits yields less generous subsidies to urban EZs but more generous subsidies to rural EZs. This asymmetry is attributable to the larger housing supply elasticities estimated to be present in rural EZs, illustrating the complex interplay between housing and labor markets in our analysis.

While calibration exercises are inevitably speculative, our numerical results strongly corroborate the theoretical message of our paper that place-based redistribution can serve as a useful complement to place-blind taxation when income groups are geographically segregated. That is, sorting ultimately eases the efficiency costs of redistributing across household earnings levels. The urban economist's mantra appears to warrant revision: There is good reason to consider helping poor people *and* poor places.

I. Motivating Facts

We begin by briefly highlighting the uneven spatial distribution of economic outcomes in the United States. The key motivation underlying place-based redistribution is that disadvantage is spatially concentrated across states, counties, and census tracts (Jargowsky 1997; Reardon and Bischoff 2011; Reardon et al. 2018; Gaubert et al. 2021). Poverty is especially concentrated across census tracts, which are spatially contiguous land areas with typically between 1,200 and 8,000 people. A number of prominent place-based policies have been defined in terms of census tracts including urban Empowerment Zones (EZs), and more recently, Opportunity Zones. We use EZs to anchor our quantitative exercises below. In pooled estimates from the 2016–2020 waves of the American Community Survey (ACS), census tracts in the top centile of poverty rates have an average poverty rate of 64 percent, despite a national poverty rate over this period of only 13 percent.

Panel A of Figure 1 illustrates the spatial concentration of poverty in Chicago, Illinois, the United States' third-largest city. Darker areas indicate higher poverty tracts in the 2016–2020 ACS. Tracts on the West Side and on the South Side have poverty rates exceeding 50 percent, while tracts in and around the Gold Coast neighborhood in the northeast of the city have near-zero poverty rates. Place-based redistribution from the Gold Coast to the West and South Sides has the potential to yield equity gains. In fact, Chicago's EZ comprises a contiguous section of the West Side and a separate contiguous section of the South Side.

Similar patterns exist at the regional level. For example, rural EZs are primarily collections of counties. Panel B of Figure 1 shows county-level poverty rates in mid-Atlantic states. Poverty is heavily clustered in the rural Appalachian area of eastern Kentucky, with rates comparable to those found in Chicago's West and South Sides. Place-based redistribution to residents of these heavily impoverished eastern Kentucky counties has the potential to yield equity gains. Three of these counties compose the Kentucky Highlands EZ. Notably, while Chicago's EZ is very disproportionately Black or Hispanic, the Kentucky Highlands EZ is over 95 percent white (US Census Bureau 2024).

Of course, place-blind transfers based on household income also redistribute to residents of poor areas. Panel C of Figure 1 uses a zip code map of Chicago to plot the share of tax filing units paying negative federal income taxes due to the Earned Income Tax Credit. Half of tax filers in parts of the West and South Sides have negative income tax bills. Similar rates of negative income tax filing are present in the Appalachian region, as shown in panel D of Figure 1.

The US tax system also makes transfers within income levels based on differences in family structure. Supplemental Appendix A investigates the spatial impact of conditioning taxes and transfers on marital and parental status. We find that these two factors essentially cancel out, implying that tax incentives for particular family arrangements do not yield substantial de facto place-based transfers within income levels.

Is it desirable to redistribute to residents of poor communities using place-based transfers, or should governments rely solely on place-blind transfers? The analysis below formulates rigorous answers to this question. The analysis reveals that the desirability of optimal place-based transfers depends not just on the extent to which

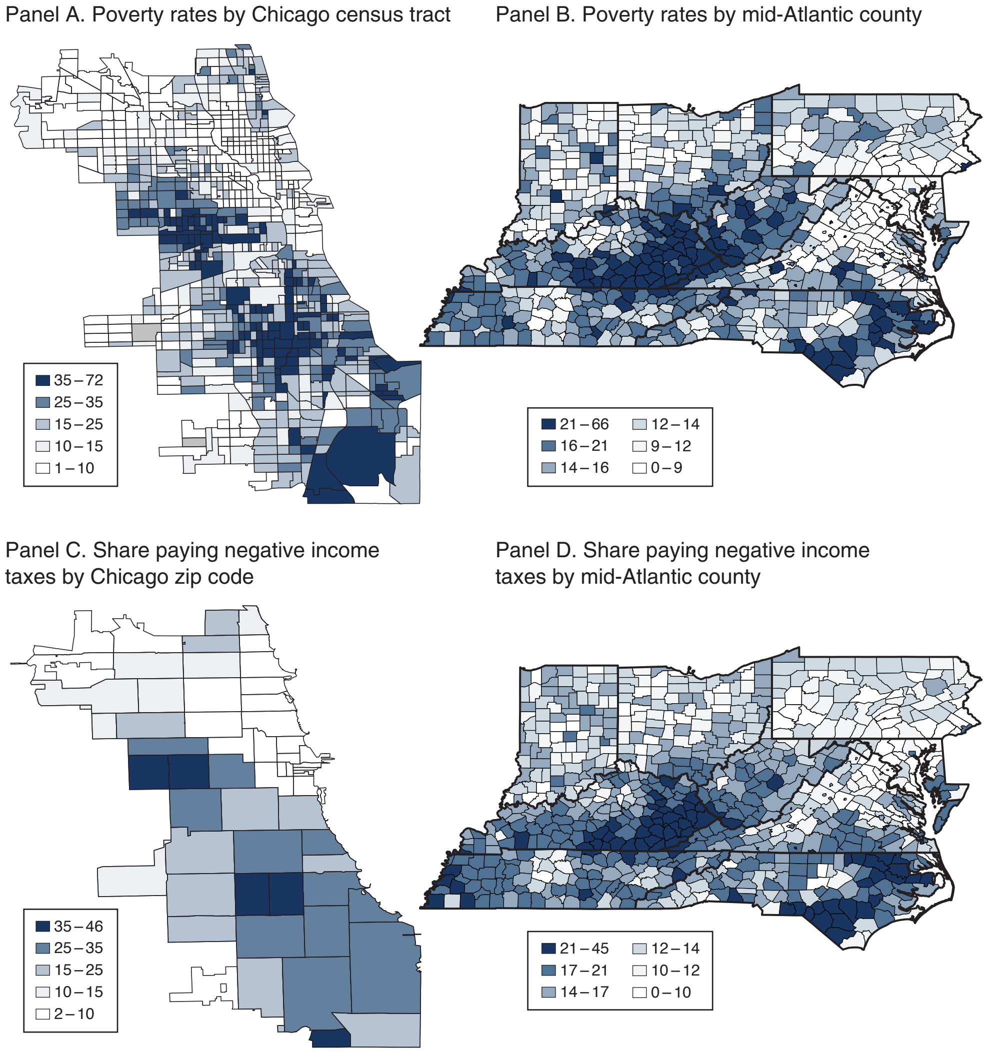

Figure 1. Poverty and Income-Based Transfers Are Spatially Concentrated

Notes: Panels A and B use the 2016–2020 ACS to plot the share of households below the poverty line, for each census tract in the city of Chicago and for each county in the mid-Atlantic region (US Census Bureau 2023). Panels C and D use 2020 Internal Revenue Service Statistics of Income zip-level aggregates to plot the share of tax filers receiving a net transfer from the federal income tax due to the refundable Earned Income Tax Credit, for each Chicago zip code and mid-Atlantic county (Internal Revenue Service 2020a,b). Geographic data are from the Census Bureau and City of Chicago (US Census Bureau 2017, 2020a,b,c; City of Chicago 2010, 2020).

poverty is spatially concentrated but also on the nature of the economic forces driving concentration.

II. Model

In this section, we lay the foundation of a spatial model in which heterogeneous households optimize over both location choice and labor supply decisions. To connect with traditional results on income taxation, place-based redistribution schemes are modeled as transferring income directly to households. In practice, place-based policies often channel spatial transfers through capital or wage subsidies to businesses (Slattery and Zidar 2020) or through federal transfers to local governments (Oates 1999). To the extent that the incidence of such policies falls on households, the guiding principles derived here will hold.

An additional goal of business tax incentives can be to correct market imperfections, for example, by exploiting agglomeration economies or endogenous amenities (Kline and Moretti 2014a; Diamond 2016; Bartik 2020; Fajgelbaum and Gaubert 2020); likewise, grants to local governments can be designed to correct fiscal externalities (Flatters, Henderson, and Mieszkowski 1974; Albouy 2012) or to compensate for underinvestment in children (Chyn and Daruich 2022). We leave to future work the task of integrating such Pigouvian corrections into a common theoretical framework with the redistributive motives studied here. Similarly, we consider only a central government and leave interactions with and incidence on subnational governments and local public services (e.g., Oates 1972; Gordon 1983; Kleven et al. 2020; Gordon 2023), such as via local property tax revenues, to future work.

A. *Preliminaries*

A unit mass of heterogeneous households chooses to live in one of two communities: 1 (Distressed) or 0 (Elsewhere). Households are characterized by a two-dimensional type $\Theta = (\theta, \phi)$, where θ indexes the household's skill, while ϕ is an idiosyncratic preference for (or negative cost to) living in Distressed over Elsewhere. These types are distributed according to a continuous two-dimensional cumulative distribution function (CDF) $H : [\underline{\theta}, \bar{\theta}] \times [\underline{\phi}, \bar{\phi}] \rightarrow [0,1]$, which we factor into a marginal CDF F of θ and a conditional CDF G_θ of ϕ given θ, with corresponding densities f and g_θ. To economize on integral notation, it will be convenient to make use of the expectations operator $E_\Theta[x] : x(\Theta) \mapsto \int x(\Theta) dH(\Theta)$ when describing average household behavior. We use $E_\theta[x] : x(\Theta) \mapsto \int x(\Theta) dF(\theta)$ to denote averages integrated over only skills.

The two locations—a word we will use interchangeably with communities—may differ in four ways. First, since we are interested in studying optimal taxes indexed by earnings *and* place, each location $j \in \{0,1\}$ may have its own income tax schedule $T_j : \mathbb{R}_{\geq 0} \rightarrow \mathbb{R}$. Communities can also differ in their level of amenities a_j, their rental cost of housing r_j, and their productivity, as reflected in local wage rates. Specifically, each location has a wage schedule $w_j : \mathbb{R} \rightarrow \mathbb{R}_+$ that is an increasing function of household skill. A household of skill type θ that resides in location j must supply $\ell = z/w_j(\theta)$ units of labor to generate pretax earnings z. This formulation allows for some skill types to possess a productive comparative advantage in a given location.

B. *Household Preferences*

Households exhibit common preferences over the consumption of a homogeneous traded good c, the amenity level a of their community of residence, and their labor supply ℓ, represented by the following subutility function:

$$(c, a, \ell) \mapsto U(c, a) - \psi(\ell).$$

Preferences over consumption and amenities are captured by the function $U(c,a)$, with derivatives $U_c > 0$, $U_a > 0$, and $U_{cc} \leq 0$, while the disutility of hours worked is captured by a convex function $\psi(\ell)$.

The price of the traded good is common in both communities and taken as the numeraire. Additionally, households inelastically demand a single unit of housing. Given these constraints, the indirect subutility for skill θ in location j can be written as

$$v_j(\theta) = \max_z U\left(z - T_j(z) - r_j, a_j\right) - \psi\left(\frac{z}{w_j(\theta)}\right).$$

We assume the relative preference ϕ for living in Distressed over Elsewhere impacts utility additively. The total indirect utility of a household of skill type θ residing in location j can therefore be written as

$$V_j(\Theta) = v_j(\theta) + j\phi. \tag{1}$$

Households choose whichever community offers higher indirect utility. The choice of location made by a household of type Θ will be denoted by

$$j^*(\Theta) = \arg\max\left\{V_0(\Theta), V_1(\Theta)\right\}. \tag{2}$$

Likewise, for every variable $x \in \{c, z, v, V\}$ we use $x_j^*(\Theta)$ to denote the value of x that would be chosen (or attained) by a household of type Θ if forced to reside in location j, while $x^*(\Theta) = j^*(\Theta)x_1^*(\Theta) + \left[1 - j^*(\Theta)\right]x_0^*(\Theta)$ gives the value of x actually realized by such a household.

C. *Landlords*

Housing is provided competitively by atomistic landlords. Each location has a housing supply elasticity ϱ_j yielding a supply equation $H_j(r_j) = \underline{H}_j r_j^{\varrho_j}$, where $\underline{H}_j \in \mathbb{R}_{\geq 0}$ is a community specific intercept. Define $L_j = E_\Theta\left[j \cdot j^* + (1 - j) \cdot (1 - j^*)\right]$ as the share of households choosing to locate in community j. Each household demands a single unit of housing. The housing market clears, ensuring $L_j = H_j(r_j)$, and generates landlord profits $\Pi_j(r_j) = \frac{1}{1 + \varrho_j} r_j H_j$. As shown in Supplemental Appendix B.1.1, these expressions for $H_j(r_j)$ and $\Pi_j(r_j)$ constitute standard solutions to the landlords' problem under isoelastic costs of providing housing.

III. Spatial Inequality

Two forces can generate locational income differences in the model. First, locations can exert a causal impact on earnings, in which case incomes can vary conditional on skill. Second, the skill composition of Distressed may differ from Elsewhere because of spatial sorting.

A. *Location Effects on Within-Skill Earnings*

Whenever locational choice exerts a causal effect on household earnings, there exists a fiscal cost to place-based redistribution. Conditional on locating in community j, the worker's optimal choice of earnings $z_j^*(\Theta)$ solves the first-order condition

$$\left[1 - T_j'\left(z_j^*(\theta)\right)\right] w_j(\theta)\, U_c\left(z_j^*(\theta) - T_j\left(z_j^*(\theta)\right) - r_j, a_j\right) = \psi'\left(\frac{z_j^*(\theta)}{w_j(\theta)}\right),$$

where we have used the fact that $z_j(\Theta) = z_j(\theta)$ as a result of the additive separability of ϕ in household utility. Optimal earnings equate the marginal disutility of earning an additional pretax dollar to its after-tax consumption value.

A type-θ household's optimal earnings in Distressed $z_1^*(\theta)$ can differ from its optimal earnings level in Elsewhere $z_0^*(\theta)$ for four reasons. First, the household's wage $w_j(\theta)$ might vary across locations. Second, the household's marginal utility of leisure is potentially shaped by the quality of local amenities (a_j), which can differ across locations. Pleasant amenities may encourage more leisure time; however, locations with poor amenities might also depress hours of work (e.g., if they lead to poor health). Third, if labor supply choices exhibit income effects, higher cost-of-living locations will induce higher earnings, all else equal. Finally, differences in location-specific tax systems $T_j(z)$ can alter incentives to work.

The empirical literature has established that earnings do tend to adjust when workers move between cities (Glaeser and Maré 2001; Baum-Snow and Pavan 2012; Dauth et al. 2022; Card, Rothstein, and Yi 2025). A typical finding is that earnings fall when moving to smaller, less-dense, metropolitan areas, which suggests employing assumptions that generate $z_1^*(\theta) \leq z_0^*(\theta)$. Less evidence is available, however, on whether earnings adjust when households move between neighborhoods in the same city. Since commuting behavior allows access to a common set of jobs from several different addresses within a city, it is reasonable to expect moves between residential neighborhoods to yield smaller earnings adjustments than moves between regions.

B. *Spatial Sorting*

Another key stylized fact established by the empirical literature is that skill groups sort spatially (Diamond and Gaubert 2022). The model encompasses three potential drivers of spatial sorting highlighted in the economic geography literature: (i) households with different skills may have different preferences for locations (skill-taste correlation), (ii) their skills may be differentially productive in different locations (comparative advantage), and (iii) the cost of living may drive poorer, lower-skill households out of some locations (income-based sorting). It is useful to review the mechanics of these drivers of sorting, as they will have different policy implications.

Equations (1) and (2) imply that locational choice is governed by a simple threshold rule. Let $\phi_\theta = v_0^*(\theta) - v_1^*(\theta)$ denote the value of ϕ that would make a type θ household indifferent between the two locations. Households with idiosyncratic preference $\phi \leq \phi_\theta$ will locate in Elsewhere, while the rest will locate in Distressed.

Hence, a share $G_\theta(\phi_\theta)$ of type θ households will locate in Elsewhere. When this share varies with θ, spatial sorting ensues. We introduce below three polar cases where such sorting arises from a single motive. These examples temporarily assume away taxes. We return to these polar cases when analyzing optimal place-based taxes to illustrate that not only the existence of sorting, but the *motive* for sorting matters for optimal taxation.

EXAMPLE 1 (Skill-Taste Correlation): *Suppose that wages and housing costs are identical in the two locations (i.e., $w_0(\theta) = w_1(\theta)$ for all θ and $r_0 = r_1$) and that amenities enter utility $U(c,a)$ additively. Optimal earnings for any household are then equal between communities: $z_0^*(\theta) = z_1^*(\theta)$. Consequently, the preference cutoff for choosing to reside in Distressed is simply $\phi_\theta = a_0 - a_1$, which does not depend on θ. Let the distribution G_θ be weakly increasing in θ, capturing that tastes ϕ are negatively dependent on skills. It follows that $G_\theta(a_0 - a_1)$ increases with θ; therefore high-skilled households will sort into Elsewhere.*

EXAMPLE 2 (Comparative Advantage): *Suppose that cities are identical except for their wage schedule and that preferences do not vary with skills (i.e., $G_\theta = G$). Elsewhere is a more productive location for all skill levels but especially so for the highly skilled, who have a comparative advantage in production there. Formally, we assume $w_0(\theta) \geq w_1(\theta)$ and $\gamma_0(\theta) > \gamma_1(\theta)$ for all θ, where $\gamma_j(\theta) = \frac{d \log w_j(\theta)}{d \log \theta} > 0$ is the elasticity of wage rates with respect to skill in location j. We show in Supplemental Appendix B.2.1 that, under these assumptions, the preference cutoff ϕ_θ for choosing Distressed increases with θ so long as U is not too concave in consumption.*[1] *Consequently, the highly skilled sort into Elsewhere.*

EXAMPLE 3 (Income-Based Sorting): *Suppose that Elsewhere is more expensive than Distressed ($r_0 > r_1$), and U is concave in consumption. Furthermore, assume that locational tastes are independent of skills ($G_\theta = G$) and that $w_0(\theta) = w_1(\theta)$ for all skill levels θ. We show in Supplemental Appendix B.2.2 that the higher cost of living in Elsewhere leads ϕ_θ to increase with θ because higher-skilled households are less impacted by the cost of living. Consequently, the highly skilled sort into Elsewhere.*

Following the discussion above, we will typically think of Distressed as a location with weakly lower productivity, less skill complementarity, worse amenities, and lower housing prices than Elsewhere. This state of affairs can be characterized by the inequalities $w_0 \geq w_1$, $\gamma_0 \geq \gamma_1$, $a_0 \geq a_1$, $r_0 \geq r_1$, with G_θ weakly increasing in θ. However, the formulas we derive apply more generally to any configuration of locational fundamentals.

[1] When U is highly concave and leisure is a normal good, income effects in labor supply can lead the cutoff ϕ_θ to become nonmonotonic in θ. We characterize the concavity threshold as a function of γ_0/γ_1 in the Supplemental Appendix. A stricter sufficient condition is given by $x \mapsto xU_c(x)$ being nondecreasing, which is satisfied by the functional forms assumed in the simulation exercises below.

IV. Planning Problem

A planner evaluates allocations subject to a weighted utilitarian welfare criterion where households have exogenous Pareto weights $\omega_H(\Theta)$ while landlords have weight ω_L. Formally, the social welfare function is

$$SWF = E_{\Theta}\left[\omega_H V^*\right] + \omega_L\left[\Pi_0(r_0) + \Pi_1(r_1)\right]. \tag{3}$$

Preferences for redistribution may arise either from concavity of utility in consumption or from heterogeneity in household weights ω_H. In what follows, we will be interested in cases where the households' weights depend only on skill type θ, as dependence on tastes can be difficult to motivate.[2] Weights obeying $d\omega_H(\theta)/d\theta < 0$ motivate redistribution from high-θ to low-θ households.

The planner evaluates allocations subject to the following budget constraint:

$$E_{\Theta}\left[j^* T_1(z_1^*) + (1 - j^*) T_0(z_0^*)\right] \geq R, \tag{4}$$

where R is an exogenous revenue requirement. Under standard regularity conditions, the budget constraint holds with equality. The marginal value of public funds is captured by the multiplier of the budget constraint, which we denote by Γ.

The social marginal welfare weight of type θ households who reside in community j is defined as $\lambda_j(\theta) = \omega_H(\theta) U_c(c_j, a_j)/\Gamma$. The assumption that ϕ enters household utility in an additively separable fashion implies that the welfare weights do not depend directly on locational preferences. Rather, the weights depend indirectly on ϕ through the location choice of the household. The quantity $\lambda_L = \omega_L/\Gamma$ gives the social marginal welfare weight of landlords. These weights summarize the redistributive tastes of the planner. At the optimum, the planner is indifferent between giving one more dollar to a household θ living in j or having $\lambda_j(\theta)$ more dollars of public funds.

If household types could be observed, the planner would equalize social marginal welfare weights across households via type-specific lump-sum taxes and transfers. Because household types are not observable, the planner instead implements an incentive-compatible second-best tax system that trades off equity and efficiency. The next two sections explicitly characterize these equity-efficiency tradeoffs.

V. Optimal Place-Based Transfers (Lump-Sum Case)

We first study the optimal design of a simplified place-based redistribution scheme where, in addition to a place-blind income tax schedule $T : \mathbb{R}_{\geq 0} \rightarrow \mathbb{R}$, the planner can introduce a lump-sum place-based transfer indexed by $t \in \mathbb{R}$ from residents of Elsewhere to residents of Distressed. Despite its simplicity, this case is rich enough to highlight the key tradeoffs involved in place-based redistribution.

[2] Though we do not pursue this idea, higher Pareto weights on households with relative tastes for Distressed could be justified as an attempt to capture a planner's desire to right perceived historical wrongs. For example, Gulf Opportunity Zones were instituted in 2005 for areas devastated by Hurricane Katrina.

Such a restricted place-based instrument may be practically relevant under political and administrative constraints. For example, Empowerment Zones provide a capped wage subsidy that yields a constant per-worker transfer when the covered worker is employed full-time.

To ease exposition, we make two simplifying assumptions in this section. First, we impose that optimal earnings exhibit no income effects by assuming quasi-linear consumption utility. In this case, redistributive motives derive exclusively from nonconstant Pareto weights $\omega_H(\theta)$. Second, we temporarily treat rents as fixed, therefore abstracting in particular from the incidence of taxes on landlords. Our general derivations of Section VI include these forces.

A. *A Simple Place-Based Redistribution Scheme*

Consider a place-based redistribution scheme in which each of the households in Elsewhere face a head tax t/L_0, while each of the households in Distressed receive t/L_1. Hence, the place-based tax faced by a household of type Θ is

$$t \cdot \frac{L_1 - j^*(\Theta, t)}{L_0 L_1}, \tag{5}$$

where we have indexed the function j^* by t in order to highlight the potential influence of the place-based transfer scheme on location choices. The tax schedule is therefore given by $T_j(z) = T(z) + t \cdot (L_1 - j)/(L_0 L_1)$. In this restricted policy scheme, the planner's budget constraint reduces to

$$E_\Theta\left[T(z^*) + t \cdot \frac{L_1 - j^*}{L_0 L_1}\right] = R.$$

The amount $E_\Theta\left[T(z^*)\right]$ is the net fiscal revenue of the place-blind income tax, while $E_\Theta\left[t \cdot (L_1 - j^*)/(L_0 L_1)\right]$ is the net fiscal revenue generated by the place-based transfer scheme. By construction, the place-based policy is ex ante budget balanced since $E_\Theta\left[t \cdot (L_1 - j^*)/(L_0 L_1)\right] = 0$.

B. *Optimality Conditions*

Consider now the welfare effect of an infinitesimal place-dependent tax reform dt. There are no mechanical effects of this reform on fiscal revenue because the reform is ex ante budget neutral. Therefore, the total welfare effect $dSWF/dt$ of the reform starting from $t = 0$ is the sum of only two components: a direct impact on welfare, denoted dW/dt, and a fiscal cost of the reform attributable to behavioral responses, denoted dB/dt.

Implementing the place-based transfer (5) generates a net transfer of utility from residents of Elsewhere to those of Distressed equal to

$$\frac{dW}{dt} = E_\Theta\left[\lambda_1 \frac{j^*}{L_1} - \lambda_0 \frac{1 - j^*}{L_0}\right] = \bar{\lambda}_1 - \bar{\lambda}_0, \tag{6}$$

where $\bar{\lambda}_j$ is the average social marginal welfare weight of households located in community j. The expression in (6) is the *equity gain* from the transfer, which will be positive so long as the average social marginal welfare weight of Distressed inhabitants is higher than that of residents of Elsewhere. Households that migrate in response to the reform do not contribute to dW/dt because marginal movers are initially indifferent between locations. When the weights depend only on θ, a sufficient condition for $\bar{\lambda}_1 > \bar{\lambda}_0$ is that there is spatial sorting such that the skill distribution in Elsewhere first-order stochastically dominates that of Distressed (Atkinson 1970).

Two forces help this condition arise. First, Distressed residents may earn sufficiently less than Elsewhere residents that consumption is lower at every consumption rank in Distressed than in Elsewhere. Second, whenever consumption and amenities are q-substitutes (i.e., $\partial^2 U/\partial c \partial a < 0$), the lower amenity level in Distressed raises the marginal utility of consumption at any fixed level of consumption, thereby raising λ_1. If preferences are sufficiently strong q-substitutes, first-order stochastic dominance will ensue. In contrast, the Cobb-Douglas preferences $U = ac$ typically used in the economic geography literature impose q-complementarity (i.e., $\partial^2 U/\partial c \partial a > 0$), which will serve to reduce the equity gain of redistributing to Distressed.

The equity gain of a place-based transfer must be weighed against its corresponding efficiency loss. Although the tax reform is ex ante budget neutral, some households may change their location as a response to the policy. As discussed above, these moves do not mechanically generate a first-order fiscal externality when starting from a place-blind tax system, nor do they generate a first-order welfare effect. However, workers who move may reduce their earnings, which will generate a first-order fiscal cost.

To compute this fiscal externality, we define $m_\theta(t) = d\big(1 - G_\theta\big(\phi_\theta(t)\big)\big)/dt = -g_\theta\big(\phi_\theta(t)\big) d\phi_\theta(t)/dt > 0$ as the number of households of skill level θ induced to move from Elsewhere to Distressed by a marginal increase in the transfer. The overall fiscal cost of movers starting from a place blind system is

$$\frac{dB}{dt} = E_\theta\Big[m(0) \cdot \big(T(z_1^*) - T(z_0^*)\big)\Big]. \tag{7}$$

Note that movers to Distressed change earnings in a way that depends only on their skill θ, not on ϕ—that is, $z_j^*(\Theta) = z_j^*(\theta)$—because idiosyncratic preferences ϕ are additively separable.

Equity-Efficiency Tradeoff.—The following result summarizes the equity-efficiency tradeoff of a small place-based transfer to Distressed starting from a place-blind tax system.

LEMMA 1: *The first-order effect on social welfare of a small per capita transfer from Elsewhere to Distressed starting from a place-blind system is* $dSWF/dt = \bar{\lambda}_1 - \bar{\lambda}_0 + E_\theta\Big[m(0) \cdot \big(T(z_1^*) - T(z_0^*)\big)\Big]$.

The expression makes clear that, for a given degree of spatial inequality $\bar{\lambda}_1 - \bar{\lambda}_0$, the place-based transfer to Distressed is more likely to be desirable when mobility responses are small or are dominated by households for whom earnings differences across space are small. Large mobility responses among households for whom earnings differences across space are large can yield a desirable place-based transfer to Elsewhere.

Lemma 1 can additionally be used to characterize the magnitude of the optimal place-based transfer. Starting from an optimal t^*, a small place-based reform will have no first-order effect on welfare but it will have a first-order fiscal externality when starting at a $t^* \neq 0$. Movers from Elsewhere to Distressed generate a fiscal loss per capita of $t^*(1/L_1 + 1/L_0) = t^*/(L_0 L_1)$ as they go from being net contributors to becoming net beneficiaries of the place-based redistribution scheme. Equating $dSWF(t)/dt$ to zero yields the optimal place-based transfer t^*.

PROPOSITION 1: *The optimal place-based transfer t^* under any place-blind tax schedule $T(\cdot)$ obeys*

$$t^* = \frac{\bar{\lambda}_1(t^*) - \bar{\lambda}_0(t^*) + E_\theta\big[m(t^*) \cdot \big(T(z_1^*) - T(z_0^*)\big)\big]}{E_\theta\big[m(t^*)\big] / \big[L_0(t^*) L_1(t^*)\big]}.$$

PROOF:

See Supplemental Appendix B.3.1.

Note that Proposition 1 holds regardless of whether the place-blind tax schedule $T(\cdot)$ is optimal. The size of the optimal transfer is increasing in the degree of inequality between Elsewhere and Distressed, which is captured by the difference $\bar{\lambda}_1(t^*) - \bar{\lambda}_0(t^*)$ in average social marginal welfare weights evaluated at the optimal value of the transfer. All else equal, the optimal transfer is larger if mobility is low or if the earnings responses to migration are small.

Supplemental Appendix B.3.2 extends the analysis here to settings featuring nonadditive locational preferences. A difficulty that arises in this extension is that welfare weights then depend on idiosyncratic tastes, leading to pitfalls that the Supplemental Appendix also discusses.

C. *Examples Revisited*

We now revisit the polar examples of sorting discussed in Section IIIB. Lemma 1 is used to study whether place-based redistribution can be unambiguously desirable in these three polar cases even when place-blind income taxes are present and set optimally. The first two examples maintain that household preferences are quasi-linear and rely on the planner's Pareto weights $\omega_H(\theta)$ to generate an equity motive for place-based redistribution. The third example brings back curvature in the utility function to analyze income effects in location choice.

EXAMPLE 4 (Skill-Taste Correlation, Continued): *Returning to Example 1, assume that the Pareto weights $\omega_H(\theta)$ strictly decline with skill. Under skill-taste correlation, the high-skilled are more likely to locate in Elsewhere, and hence the equity gain $\bar{\lambda}_1 - \bar{\lambda}_0$ to a small increase in t is positive. Moreover, there is no fiscal cost to a small increase in t starting from $t = 0$ because movers do not experience wage changes and therefore do not change their income tax payments. Consequently, the right hand side of the condition depicted in Lemma 1 must be positive, implying* *that a small positive place-based head tax is unambiguously desirable, even in the presence of an optimal place-blind income tax.*

EXAMPLE 5 (Comparative Advantage, Continued): *Suppose that the high-skilled enjoy a discrete wage advantage in Elsewhere:* $w_1(\theta) = \theta$ *and* $w_0(\theta) = \theta + b \cdot \mathbf{1}\{\theta \geq \theta^*\}$, *for some* $\theta^* > \underline{\theta}$ *and* $b > 0$. *Households with skill levels higher than* θ^* *enjoy a comparative advantage in Elsewhere. Consider the simplified case where utility is quasi-linear, labor supply is isoelastic, Pareto weights* $\omega_H(\theta)$ *are decreasing in* θ, *and all households have the same value of* ϕ. *As detailed in Supplemental Appendix B.3.4, these assumptions imply there exist values of* ϕ *such that all highly skilled* $(\theta \geq \theta^*)$ *households strictly prefer locating in Elsewhere, while all less-skilled* $(\theta < \theta^*)$ *households strictly prefer Distressed. In this environment, a small* $t > 0$ *generates equity gains by redistributing from the highly skilled to the less skilled but incurs no fiscal cost because the transfer avoids triggering any migration. Thus, introducing a small* t *is welfare-improving, even if the place-blind tax system is optimal. As shown in the Supplemental Appendix, this conclusion also holds in the presence of taste heterogeneity if the higher skill types remain inframarginal but the low-skilled households move in response to the transfer. These moves have no fiscal consequences because individuals with* $\theta < \theta^*$ *do not change their earnings upon moving.*

In the examples above, taxing location choices is unambiguously desirable. A related literature beginning with Atkinson and Stiglitz (1976) provides conditions under which commodity taxation is superfluous in the presence of an optimal nonlinear income tax. The key sufficient condition for commodity taxes to be superfluous is that if high earners were hypothetically forced to earn less, they would purchase the same consumption bundle as their lower earning peers (Saez 2002; Ferey, Lockwood, and Taubinsky 2024).[3] Example 4 violates this condition: Skill-taste correlation directly implies the highly skilled would be more likely to reside in Elsewhere even if they earned less. Example 5 involves wage changes omitted in commodity tax models that also induce the high-skilled to locate in Elsewhere even if forced to earn less.

In our final example, we reintroduce income effects in order to study optimal place-based redistribution in a model with sorting driven solely by income effects in location choice. Atkinson and Stiglitz (1976) showed that commodity taxes are superfluous when consumption differences are driven entirely by income effects. This final example demonstrates that place-based transfers can also be superfluous when locational sorting is driven solely by income effects.

EXAMPLE 6 (Income-Based Sorting, Continued): *Returning to the setting in Example 3, suppose locational preferences are homogenous (i.e.,* $\underline{\phi} = \bar{\phi} = 0$) *and household utility takes the form* $U(z - T(z) - r_j, a_j) - \psi(z/\theta)$ *with* $U_{cc} < 0$ *and* $U_{ca} > 0$. *Suppose also that Elsewhere has better amenities but higher rents than Distressed* ($a_0 > a_1$ *and* $r_0 > r_1$). *In this case, all households with skill above some*

[3] While the results in these papers yield similar intuition, the theoretical results do not directly apply to our setting: Both Saez (2002) and Ferey, Lockwood, and Taubinsky (2024) consider optimal taxation of continuous consumption decisions, while the present discussion concerns taxation of a discrete choice of location.

threshold level will sort into Elsewhere to benefit from higher amenities, while all those with lower skills, who are more sensitive to the cost of living, will sort into Distressed. These preferences obey the key condition for superfluous commodity taxes: If high earners were hypothetically forced to work less such that they earn and consume as little as lower earners, they would purchase the same consumption bundle as lower earners. We show in Supplemental Appendix B.3.5 that, indeed, a tax system with $t > 0$ cannot improve welfare relative to a properly designed place-blind tax system. Our proof relies on the absence of idiosyncratic locational preferences; we explore numerically below how locational preferences can generate nonzero optimal place-based transfers when income effects drive skill sorting.

VI. Optimal Place-Based Transfers (General Case)

This section analyzes the general model of Section II, acknowledging the potential for income effects in labor supply, incorporating equilibrium adjustments in housing rents, and lifting the restriction that place-based transfers take the form of lump-sum transfers.

A. *Optimality Conditions*

The planner chooses location-specific tax schedules $\{T_0(\cdot), T_1(\cdot)\}$ to maximize the social welfare function (3) subject to the budget constraint (4). As is standard in the optimal taxation literature, we characterize the solution to this problem using optimal control methods. Denote the location-specific marginal utility of consumption by $U^*_{cj}(\theta) = U_c\big(z^*_j(\theta) - T_j\big(z^*_j(\theta)\big) - r_j, a_j\big)$. In what follows, we assume that the marginal rate of substitution between labor earnings and consumption $-\psi'\big(z^*_j(\theta)/w_j(\theta)\big)/\big(w_j(\theta)\cdot U^*_{cj}(\theta)\big)$ is decreasing in θ in each location, which ensures that the usual single-crossing property holds.[4] The nonlinear schedule of optimal taxes in the two locations is characterized by the marginal tax rate schedules $T'_0(\cdot)$ and $T'_1(\cdot)$ and the transfers to zero earners (demogrants) $-T_0(0)$ and $-T_1(0)$.

PROPOSITION 2: *The optimal place-specific marginal tax rates are characterized by the differential equations*

$$(8)\quad \frac{T'_0\big(z^*_0(\theta)\big)}{1 - T'_0\big(z^*_0(\theta)\big)} = \frac{1 + \eta^U_0(\theta)}{\eta^C_0(\theta)} \frac{\gamma_0(\theta)}{\theta f(\theta) G_\theta(\phi_\theta)} \times U^*_{c0}(\theta)\left\{ \int_\theta^{\bar{\theta}} \frac{1 - \lambda_0(s)}{U^*_{c0}(s)} G_s(\phi_s) dF(s) + \Delta\tau^+(\theta) + (\lambda_L - 1)\Delta r^+(\theta) \right\},$$

[4] This assumption allows us to rely on local incentive compatibility constraints to derive the optimal tax schedule as in Mirrlees (1971) and Rothschild and Scheuer (2013). Note that multidimensional heterogeneity does not undermine standard screening arguments here because the tax schedules are location-specific and ϕ does not affect optimal earnings conditional on location.

$$(9)\quad \frac{T_1'\big(z_1^*(\theta)\big)}{1 - T_1'\big(z_1^*(\theta)\big)} = \frac{1+\eta_1^U(\theta)}{\eta_1^C(\theta)} \frac{\gamma_1(\theta)}{\theta f(\theta)\big[1 - G_\theta(\phi_\theta)\big]}$$

$$\times\, U_{c1}^*(\theta)\bigg\{\int_\theta^{\bar\theta} \frac{1-\lambda_1(s)}{U_{c1}^*(s)}\big[1 - G_s(\phi_s)\big]dF(s)$$

$$- \Delta\tau^+(\theta) - (\lambda_L - 1)\Delta r^+(\theta)\bigg\},$$

where

$$\Delta\tau^+(\theta) \equiv \int_\theta^{\bar\theta}\big[T_1\big(z_1^*(s)\big) - T_0\big(z_0^*(s)\big)\big]\, g_s(\phi_s)dF(s),$$

$$\Delta r^+(\theta) \equiv \left(\frac{r_1}{\varrho_1} - \frac{r_0}{\varrho_0}\right)\cdot \int_\theta^{\bar\theta} g_s(\phi_s)dF(s).$$

The difference in demogrants in the two locations is characterized by the restriction

$$(10)\quad L_0L_1\int_{\underline{\theta}}^{\bar\theta}\bigg[\frac{1}{L_1}\big[\lambda_1(\theta) - 1\big]\frac{1}{U_{c1}^*(\theta)}\big[1 - G_\theta(\phi_\theta)\big]$$

$$- \frac{1}{L_0}\big[\lambda_0(\theta) - 1\big]\frac{1}{U_{c0}^*(\theta)}G_\theta(\phi_\theta)\bigg]dF(\theta)$$

$$+ (\lambda_L - 1)\Delta r^+(\underline{\theta}) + \Delta\tau^+(\underline{\theta}) = 0.$$

PROOF:

See Supplemental Appendix B.4.1.

The function $\eta_j^U(\theta) = d\log z_j^*(\theta)/d\log(1-\tau_j)$ denotes the uncompensated elasticity of earnings with respect to the net of tax rate in community j for households of skill type θ, while $\eta_j^C(\theta) = \partial\log z_j^*(\theta)/\partial\log(1-\tau_j) > 0$ gives the corresponding compensated (i.e., Frisch) elasticity, where $\tau_j = T_j'\big(z_j^*(\theta)\big)$ is the place-specific MTR at the optimum. The term $\Delta\tau^+(\theta)$ measures the fiscal externality induced by movers from Elsewhere to Distressed for all skill levels $s \geq \theta$. At each skill level s, there are $g_s(\phi_s)f(s)$ households indifferent between the two communities who, if induced to move by a tax reform, will change their tax revenue by an amount $T_1\big(z_1^*(s)\big) - T_0\big(z_0^*(s)\big)$. Similarly, $\Delta r^+(\theta)$ measures the impact of movers from Elsewhere to Distressed with skill level higher than θ on net rent payments to landlords. Evaluating these expressions at $\theta = \underline{\theta}$ yields the total fiscal externality of movers and their total impact on net rent payments to landlords, respectively.

B. *Demogrants*

Equation (10) pins down the difference in demogrants conditional on the schedule of MTRs. At the optimal tax schedule, a small decrease in $T_1(0)$ financed by a small increase in $T_0(0)$ generates welfare effects captured by the first two terms of equation (10): The first term captures welfare changes between workers residing in different locations, while the second term captures welfare effects derived from redistribution between workers and landlords as rents adjust. These welfare effects generate fiscal cost $\Delta\tau^+(\underline{\theta})$. At the optimal place-specific tax schedules, the total equity gain of this small perturbation to the tax system must be offset by the total fiscal externality. Notice that when housing supply is infinitely elastic and income effects are absent from labor supply, equation (10) reduces to $\bar{\lambda}_1 - \bar{\lambda}_0 + \Delta\tau^+(\underline{\theta})/(L_0 L_1) = 0$, which is equivalent to the expression obtained in Proposition 1 after restricting MTRs to be place-blind.

Perturbing the tax system affects equilibrium rental rates, as movers change the price of housing for all inframarginal households. Subsidizing Distressed leads households to move from Elsewhere to Distressed, which raises rents in Distressed and lowers them in Elsewhere. On net, this generates a transfer $\Delta r^+(\theta)$ from renters to landlords. The sign of $\Delta r^+(\theta)$ depends on the ratio of rents to housing supply elasticities $(r_1/\varrho_1 - r_0/\varrho_0)$. Baum-Snow and Han (2024a,b) find that rural high-poverty US areas exhibit lower rents and higher housing supply elasticities than the rest of the country on average, which suggests $\Delta r^+(\theta) < 0$ for place-based transfers to distressed rural areas. Such transfers lead households to move out of congested areas, which causes rents to react downwards strongly in those areas while rents reacts mildly upwards in destination distressed rural areas. Assuming that landlords tend to have lower welfare weight than the average household ($\lambda_L < 1$), the rent term generates a motive for place-redistribution to poor rural areas.

In contrast, Baum-Snow and Han (2024a,b) find that urban high-poverty US neighborhoods exhibit lower rents but also lower housing supply elasticities than the rest of the country on average. In this case, the rent effect can turn negative because place-based transfers to distressed urban neighborhoods induce moves from the rest of the country to those relatively congested neighborhoods. The rent term can therefore generate a motive for place-based transfers away from distressed urban neighborhoods when $\lambda_L < 1$ and the rent differences between distressed urban areas and elsewhere are small enough relative to their housing supply elasticity differences for the housing supply elasticity effect to dominate.

C. *Marginal Tax Rates*

The optimal tax policy involves place-dependent MTRs that exhibit a familiar structure. Note, if we drop the terms $\Delta\tau^+(\theta)$ and $(\lambda_L - 1)\Delta r^+(\theta)$ from equations (8) and (9) these expressions reduce to standard results providing the optimal MTR schedules for standalone economies (e.g., Saez 2001, equation 25).

Putting the new terms aside for a moment, a first reason why MTRs may differ across places is sorting: If skilled households are overrepresented in Elsewhere then MTRs will be higher there, a phenomenon captured by the inverse hazard ratio terms in equations (8) and (9) familiar from standard optimal tax results (Diamond 1998). A given labor supply distortion at middle incomes raises less revenue in Distressed where there are proportionally fewer high earners.[5] Second, the skill composition within location affects how the average welfare weights in a location compare to the average welfare weight in the economy. Third, there may be differences in welfare weights across locations conditional on type. When households of a given skill level have higher social marginal welfare weights in Distressed $(\lambda_1(\theta) > \lambda_0(\theta))$ then optimal MTRs in Elsewhere will be elevated.

The new term $\Delta\tau^+(\theta)$ reflects the fiscal externality generated by movers of skill θ and above who respond to changes in taxes across locations. If taxes in Elsewhere increase, households migrate to Distressed. When within-skill earnings are lower in Distressed, this term is negative. This force limits tax differences between locations, particularly when locational effects on earnings and migration responses are large. An analogous term is featured in Scheuer's (2014) analysis of occupation-specific taxes, where occupational switches govern fiscal externalities when workers and entrepreneurs have different tax liabilities. Unlike that paper, however, the fiscal externalities here can be mediated both by income effects stemming from cost of living differences across locations and by comparative advantage.

Finally, the term $(\lambda_L - 1)\Delta r^+(\theta)$ captures the net transfers from renters to landlords as a result of rent changes induced by taxation. When $\lambda_L < 1$, the planner may use place-specific taxes to redistribute from landlords to renters. This force tends to lower relative MTRs in Elsewhere whenever moving to Distressed generates transfers from renters to landlords on net $(\Delta r^+(\theta) > 0)$.

VII. Sorting Motives and Optimal Taxes: Numerical Results

This section explores quantitatively the extent to which different sorting motives generate different optimal place-based redistribution schemes. To isolate the role of each motive on the structure of optimal taxes, we solve calibrated versions of the model numerically where a single sorting motive (skill-taste correlation, comparative advantage, or income-based sorting) drives income differences between communities, while varying migration responsiveness. Additional details on these simulations can be found in Supplemental Appendix C. The subsequent section allows sorting to be driven by combinations of these forces.

In the numerical exercises that follow, household utility takes a form commonly found in the urban economics literature: a Cobb-Douglas aggregate of amenities, consumption (including unit housing), and an idiosyncratic location preference. Without loss of generality, common valuations of the unobserved amenities are folded into the location taste term ϕ. To allow for labor supply decisions, this canonical specification is augmented with an isoelastic disutility of labor supply. Formally, the household utility function can be written

$$\ln\big(z - T_j(z) - r_j\big) - \frac{\eta}{1+\eta}\left(\frac{z}{W\theta^{\gamma_j}}\right)^{\frac{1+\eta}{\eta}} + j\phi. \tag{11}$$

[5] Kremer (2003) makes an analogous hazard-rate-based argument for lower MTRs on young earners relative to middle-age earners. The true inverse hazard rate that matters is the inverse hazard rate of the earnings distribution as emphasized by Saez (2001), which is why the formulas contain the additional ratio $\gamma_j(\theta)/\theta$.

Note that, with unit housing demand, low-income households are particularly sensitive to rent differentials, which generates income-based sorting.

Location preferences ϕ are assumed to be logistically distributed with mean $\mu - \beta F(\theta)$ and standard deviation κ. The parameter $\mu = a_1 - a_0$ captures the difference in amenities between the two locations. To accommodate the possibility of skill-taste correlation, the conditional distribution $G_\theta(\phi)$ of location preferences given skill type is assumed to take the form $G_\theta(\phi) = \left[1 + \exp\left(-\left[\phi - \mu + \beta F(\theta)\right]/\kappa\right)\right]^{-1}$. The parameter β governs the strength of skill-taste correlation, with $\beta = 0$ yielding independence. The elasticity of migration with respect to the mean relative utility of Distressed is $d \ln G_\theta / d \ln \mu = 1/\kappa \cdot \left[1 - G_\theta(\phi)\right]$. Thus, a higher κ generates lower migration elasticities.

The distribution of θ is assumed to be log-normal with mean and variance parameters (ξ, σ). As in Mankiw, Weinzierl, and Yagan (2009), we additionally allow a mass point at $\theta = 0$ of "disabled" households and a Pareto distributed right tail with parameter $p > 0$. Note that equation (11) assumes $w_j(\theta) = W\theta^{\gamma_j}$. We normalize $\gamma_0 = 1$ throughout our analysis. Hence, whenever $\gamma_1 < 1$, higher-skilled workers have a comparative advantage at working in Elsewhere and households with $\theta > 1$ also enjoy an absolute advantage in Elsewhere. Labor supply is governed by a Frisch elasticity $\eta > 0$. Finally, concavity in the consumption aggregate generates income-based sorting when rental rates differ $(r_0 \neq r_1)$.

Table 1 details the values chosen for (η, ξ, σ, p) along with other key calibration choices. Throughout this section, Distressed is taken to be a small area with an overrepresentation of low earners that mimics the urban Empowerment Zones in the 2016–2020 ACS (US Census Bureau 2020d,g) while Elsewhere is calibrated to resemble the rest of the United States under the existing place-independent tax system.[6] The calibration chooses three parameters—μ, W, and a sorting parameter (either β, γ_1, or $\underline{H}_1$) capturing one of the three sorting motives—to match three empirical moments: (i) Distressed covers 1.7 percent of the population, (ii) 39 percent of households nationwide earn under \$50,000, and (iii) 56 percent of Distressed residents earn under \$50,000. Although parameters are chosen jointly to match the three moments, μ can be thought of as governing the size of Distressed (moment i) and W the scale of average earnings given a skill distribution (moment ii). The sorting parameter can be thought of as rationalizing moment (iii) conditional on the other parameters.

The Elsewhere housing supply elasticity ϱ_0 is set to 0.34 based on estimates from Baum-Snow and Han (2024a,b). The Elsewhere housing supply shifter $\underline{H}_0$ is chosen to yield ACS-based Elsewhere rent $r_0 = \$7{,}284$. The Distressed housing supply elasticity ϱ_1 is also set in this section to 0.34. In the income-based sorting calibrations we choose $\underline{H}_1$ to match the sorting moment. Otherwise, $\underline{H}_1$ is set to ensure $r_1 = r_0 = \$7{,}284$ under the existing tax system. Household Pareto weights $\omega_H(\theta)$ are set to one for all θ to ensure that redistribution across households is exclusively driven by decreasing marginal consumption utility.

[6] We obtain a list of EZs from the instructions page for IRS Form 8844 (IRS 2021). The data are processed with crosswalks for EZs, tracts, and states obtained from US Census Bureau (2020e), Chetty et al. (2018), Derenoncourt et al. (2024), and Kennedy (2022).

TABLE 1—PARAMETERS THAT ARE FIXED ACROSS SIMULATIONS

Parameter	Value	Source
Panel A. Features of the current tax system		
Current place-blind lump-sum transfer	\$11,214	Piketty, Saez, and Zucman (2018a,b)
Current tax brackets	{\$0K, \$20K, \$500K}	Piketty, Saez, and Zucman (2018a,b)
Current marginal tax rates	{44.6%, 28.1%, 49.4%}	Piketty, Saez, and Zucman (2018a,b)
Exogenous revenue requirement, R	\$14,746	Implied under symmetric benchmark
Panel B. Preference and skill distribution parameters		
Labor supply elasticity, η	0.5	Chetty et al. (2011)
Mean of log-normal skill distribution, ξ	2.757	Mankiw, Weinzierl, and Yagan (2009)
Std. dev. of log-normal skill distribution, σ	0.5611	Mankiw, Weinzierl, and Yagan (2009)
Pareto parameter of Pareto skill distribution, p	2	Mankiw, Weinzierl, and Yagan (2009)
Grid size for skill distribution, N	578	–
Comparative advantage in Elsewhere, γ_0	1.00	Normalization
Household Pareto weights, $\omega_H(\theta)$	1.00	–
Panel C. *Features of Elsewhere* ($j = 0$) *and Distressed* ($j = 1$)		
Distressed population share, L_1 (under current taxes)	1.7%	2016–2020 ACS (US Census Bureau 2020d)
Elsewhere population share, L_0 (under current taxes)	98.3%	2016–2020 ACS (US Census Bureau 2020d)
Elsewhere housing supply elasticity, ϱ_0	0.34	Baum-Snow and Han (2024a,b)
Elsewhere housing supply shifter, $\underline{H}_0$	0.50	Implied
Elsewhere rent, r_0 (under current taxes)	\$7,284	2016–2020 ACS

Notes: This table enumerates parameters and empirical quantities used in our numerical simulations that remain fixed across all scenarios. Panel A shows the tax system under which we calibrate free parameters to match targeted moments in each simulation scenario. Panel B shows primitives governing household and social preferences and the parameters governing the shape of the skill distribution. Finally, panel C shows features of Elsewhere and Distressed. The quantity we use for the cost of housing in Elsewhere r_0 is the twentieth percentile rent, according to the ACS microfiles. Dollar amounts are in 2020 US dollars.

The landlord weight ω_L is chosen to ensure that the social marginal welfare weight of landlords λ_L equals one in the symmetric benchmark below, which in practice leads to values of λ_L at place-based optima very close to one. This choice ensures the planner has no motive to redistribute away from (or towards) landlords on the margin.

Finally, to probe the dependence of our findings to the degree of migration responsiveness assumed, we vary κ across a range of values. For large values of κ, the sorting moments were unable to be rationalized by income-based sorting alone (i.e., matching the moments would have required setting $\underline{H}_1 < 0$). Income-based sorting results are therefore depicted for a restricted range of κ values.

A. *No-Sorting Benchmark*

The no-sorting symmetric benchmark has no skill-taste correlation ($\beta = 0$), no comparative advantage ($\gamma_1 = \gamma_0 = 1$), and no income-based sorting ($\underline{H}_1$ is set such that $r_1 = r_0 = \$7{,}284$). As detailed in Supplemental Appendix C, the optimal tax system is found by numerically solving the system of equations listed in Proposition 2.

As expected, the optimal tax systems are identical for the two communities in this symmetric benchmark. Panel A(i) of Figure 2 displays the optimal marginal tax rate schedule, which exhibits the classic U-shape when top skills are Pareto distributed (Diamond 1998; Saez 2001).[7] Panel B(i) of Figure 2 shows the same

[7] Since the bottom type in our simulations does not generate labor earnings ($\underline{\theta} = 0$), the optimal bottom MTR is 1 (Piketty and Saez 2013).

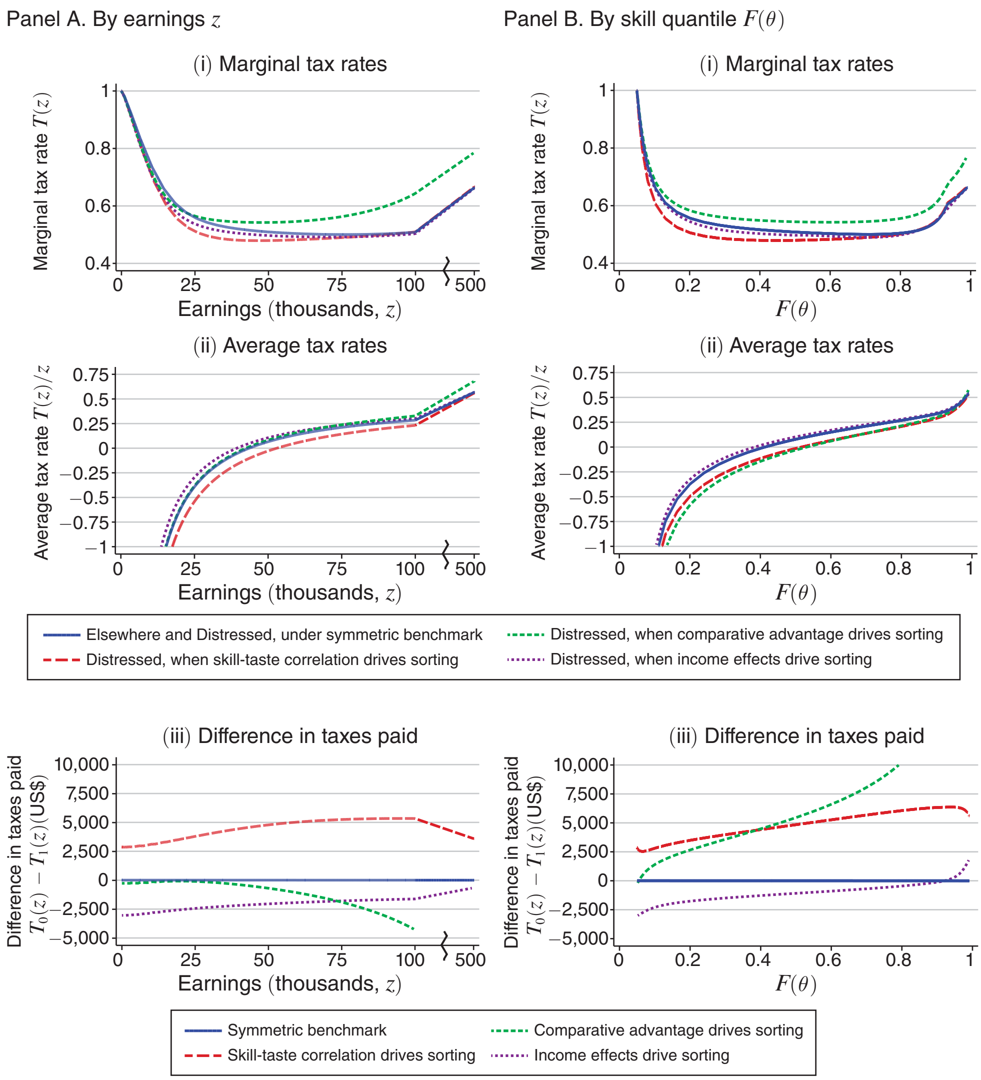

Figure 2. Optimal Tax Schedules by Sorting Motive

Notes: This figure shows how optimal place-based redistribution varies with the driver of sorting between Distressed and Elsewhere. Panels A and B show optimal tax schedules faced by households at different earnings and skill levels, respectively. Panels A(i) and B(i) show marginal tax rates (MTRs). Panels A(ii) and B(ii) show average tax rates (ATRs). Supplemental Appendix Figure 1 shows that MTRs and ATRs are similar in Elsewhere across sorting scenarios. Panels A(iii) and B(iii) show the difference in annual tax amounts, equal to taxes in Elsewhere minus taxes in Distressed. Each panel depicts series for four theoretical scenarios: one in which there is no driver of sorting, one in which skill-taste correlation is the only driver of sorting, one in which comparative advantage is the only driver of sorting, and one in which income effects (via rent differences across communities) are the only driver of sorting. The standard deviation of idiosyncratic preferences for living in Distressed κ is set to 0.5. The substantial contrast between the comparative advantage series in panel A(iii) and panel B(iii) reflects productivity differences: a given household is more productive in Elsewhere and therefore earns more and would pay more tax even under a place-blind tax system. Our preferred measure of the average place-based transfer Δ_z reflects only tax differences.

marginal tax rate patterns when indexing households by skill quantile $F(\theta)$ rather than earnings. Panels A(ii) and B(ii) of Figure 2 display average tax rates, which rise monotonically with earnings and skill. Low-earnings households receive

TABLE 2—OPTIMAL PLACE-BASED REDISTRIBUTION BY SORTING MOTIVE

	Income-constant average tax differences, Δ_z	Difference in demogrants, Δ_0	Skill-taste correlation, β	Comparative advantage, γ_1	Calibrated rent ratio, r_1/r_0
	(1)	(2)	(3)	(4)	(5)
Panel A. High migration: SD of idiosyncratic preferences for living in Distressed $\kappa = 0.5$					
Skill-taste correlation	4,805	2,862	0.85	1.00	1.00
Comparative advantage	−2,763	−268	0.00	0.924	1.00
Income-based sorting	−2,225	−3,042	0.00	1.00	0.07
Panel B. Low migration: SD of idiosyncratic preferences for living in Distressed $\kappa = 4$					
Skill-taste correlation	10,918	6,608	6.83	1.00	1.00
Comparative advantage	7,091	3,740	0.00	0.906	1.00

Notes: This table displays optimal tax results under three sorting scenarios: one in which skill-taste correlation is the only driver of sorting, one in which comparative advantage is the only driver of sorting, and one in which income effects (via rent differences across communities) are the only driver of sorting. Panel A reports results for scenarios with κ set to 0.5, implying stronger migration responses. Panel B reports results for scenarios with κ set to 4, implying weaker migration responses. Panel B omits the income-based sorting row because the moments cannot be rationalized with nonnegative Distressed rent when κ is greater than approximately 0.55. Columns 1 and 2 show our measures of place-based redistribution: the summary measure Δ_z of Elsewhere-minus-Distressed tax differences across all households, and the Elsewhere-minus-Distressed difference Δ_0 in taxes on zero-earners only. Columns 3–5 report the sorting parameters (r_1/r_0 is implied by the calibrated income-based-sorting parameter $\underline{H}_1$ and other assumed values). See Supplemental Appendix Table 2 for all simulation parameters underlying these scenarios.

sizable transfers leading to negative average tax rates. The demogrant transfer to zero-earners $-T_0(0) = -T_1(0)$ is \$27,243.[8] This demogrant is taxed away as earnings increase, leading to positive average tax rates for households in the top sixty percent of the earnings distribution.

Optimal taxes will differ across communities as we move away from this symmetric benchmark. We use two metrics, reported in Table 2, to summarize differences in taxes between communities. Let $\Delta_0 = T_0(0) - T_1(0)$ denote the amount by which the demogrant in Distressed exceeds the demogrant in Elsewhere. This quantity measures the optimal place-based transfer to Distressed for disabled households, who earn zero.

To summarize tax differences across all households, we use a second measure based on the within-earnings difference in taxes paid $T_0(z) - T_1(z)$, rather than the within-skill difference in taxes paid $T_0(z_0^*(\theta)) - T_1(z_1^*(\theta))$, as the latter measure would reflect not only tax differences but also productivity and rent impacts on earnings. Specifically, our preferred measure of the average place-based transfer,

$$\Delta_z = \frac{1}{2} \cdot E_\theta\Big[\big[T_0(z_0^*(\theta)) - T_1(z_0^*(\theta))\big] + \big[T_0(z_1^*(\theta)) - T_1(z_1^*(\theta))\big]\Big],$$

is an equally weighted average of two indices of tax differences across the two communities. The first index is the average difference in taxes paid that would result if every household was taxed based on their optimal Elsewhere earnings $z_0^*(\theta)$. The

[8] Optimal tax simulations based on log consumption utility routinely find larger demogrants transfers and top marginal tax rates than prevail in the United States (Saez 2001; Mankiw and Weinzierl 2010).

second index is the average tax difference that would emerge if every household was taxed based on their optimal Distressed earnings $z_1^*(\theta)$.

Finally, note that the discrepancy $\Delta_z - \Delta_0$ between our two transfer measures reflects only differences in MTR schedules across the two communities. We return to this point frequently below. Section VIIF decomposes the forces generating differences in optimal MTR schedules across locations.

B. *Skill-Taste Correlation*

When sorting is generated entirely by skill-taste correlation, the optimal place-based transfer to Distressed is implemented via both a substantial per capita transfer and lower marginal income tax rates. There are fewer households with high incomes to tax in Distressed, therefore high marginal tax rates yield less revenue per dollar of distortion in Distressed than in Elsewhere. Consequently, as depicted in panels A(i) and B(i) of Figure 2, the entire nonlinear tax schedule is shifted down in Elsewhere.

Panel A of Table 2 reports that when sorting is solely driven by skill-taste correlation and $\kappa = 0.5$, a strong level of migration responsiveness approximately corresponding to our urban calibrations described in the next section, the optimal tax system entails residents of Distressed receiving an average place-based transfer of \$4,805. The difference in demogrants is smaller (\$2,862), implying that about 40 percent of the average place-based transfer arises through lower MTRs in Distressed. The lower MTRs in Distressed yield larger transfers to Distressed at middle incomes than at low incomes, as displayed in panel A(iii) of Figure 2.

Panel B of Table 2 repeats the analysis for $\kappa = 4$, entailing relatively weak migration responsiveness that approximately corresponds to our rural calibrations discussed in the next section. This eightfold increase in κ requires an eightfold increase in β to rationalize the sorting moments. The weaker migration response reduces the fiscal externality to place-based redistribution and more than doubles the optimal place-based transfer to Distressed. These results highlight the quantitative importance of migration responsiveness for the levels of optimal place-based redistribution.

C. *Comparative Advantage*

Panel A of Table 2 reveals that when sorting is solely driven by comparative advantage and $\kappa = 0.5$, the optimal tax system entails a *negative* average place-based transfer to Distressed. Equivalently, the optimal tax system entails a positive average transfer to Elsewhere in the amount of \$2,763. In contrast, demogrants are essentially equal in the two locations, implying that the optimal tax system is nearly place-neutral for the least skilled. Evidently, the transfers to Elsewhere are facilitated via higher MTRs in Distressed, a pattern apparent from panels A(i) and B(i) of Figure 2.

Panel B of Table 2 shows that reducing migration responsiveness reverses the direction of transfers. Setting $\kappa = 4$ and repeating the calibration, the resulting optimal tax system yields an average place-based transfer to Distressed of \$7,091, with an optimal demogrant that is \$3,740 larger in Distressed than in Elsewhere. The finding that the average tax difference Δ_z exceeds the difference in demogrants Δ_0 implies that MTRs are lower in Distressed on average. As illustrated in Supplemental Appendix Figure 2, MTRs turn out to be lower in Distressed at all but the highest income levels. This finding echoes the intuition developed in Section V: The greater the migration responses, the higher the efficiency cost of the policy compared to its equity gains. With sufficiently high migration responsiveness, the direction of optimal transfers is reversed.

D. *Income-Based Sorting*

Panel A of Table 2 reveals that a rent ratio of 0.07 is needed to rationalize sorting entirely by income effects when $\kappa = 0.5$. This extreme rent difference yields large income effects that amplify the fiscal externalities associated with moves to Distressed. It also generates strong motives for redistribution towards Elsewhere since Elsewhere households are burdened by much higher rents. Evidently, the redistributive motive generated by higher rents dominates the redistributive motive generated by low-skill sorting in this parameterization because of the strong nonhomotheticity in housing consumption.

When sorting is driven purely by income effects, the optimal tax system involves an average place-based transfer away from Distressed and toward Elsewhere of \$2,225. This transfer partially compensates low-skilled types for the higher rent in Elsewhere, an effect that grows with the dispersion of locational tastes. Figure 3 shows that as the standard deviation of idiosyncratic location preferences κ shrinks, optimal place-based transfers tend toward zero, which mirrors the analytical result in Example 6 and accords with recent results in the optimal commodity taxation literature (Kaplow 2008; Allcott, Lockwood, and Taubinsky 2019).

E. *Sensitivity to* κ

Figure 3 illustrates the sensitivity of optimal place-based transfers to migration responsiveness under each sorting motive by repeating the Table 3 analysis at various values of $\kappa \in [0.3, 5]$. When comparative advantage drives sorting, the average place-based transfer is negative for values of κ less than approximately one and positive for higher values. By contrast, in the skill-taste correlation case, κ influences the size of the transfer but not its sign.

Note that Δ_0 and Δ_z have opposite signs when comparative advantage drives sorting and κ is near 0.75. At such levels of intermediate migration responsiveness, the planner optimally provides higher transfers to the poor in Distressed, while imposing higher taxes on the rich in Distressed. For example, at $\kappa = 1$, the poorest in Distressed receive a place-based transfer of \$1,254 (Figure 3, panel B), while households in Distressed at the ninety-ninth percentile skill level pay a place-based tax of \$12,398.[9] Hence, the optimal transfer is highly nonlinear.

Section V discussed how when the planner is only able to implement flat transfers, the optimal policy becomes a horse race between the fiscal costs of migration and the

[9] That is, $1/2 \cdot \left[T_0\big(z_0^*(F^{-1}(0.99))\big) - T_1\big(z_0^*(F^{-1}(0.99))\big)\right] + 1/2 \cdot \left[T_0\big(z_1^*(F^{-1}(0.99))\big) - T_1\big(z_1^*(F^{-1}(0.99))\big)\right] = -12{,}398$.

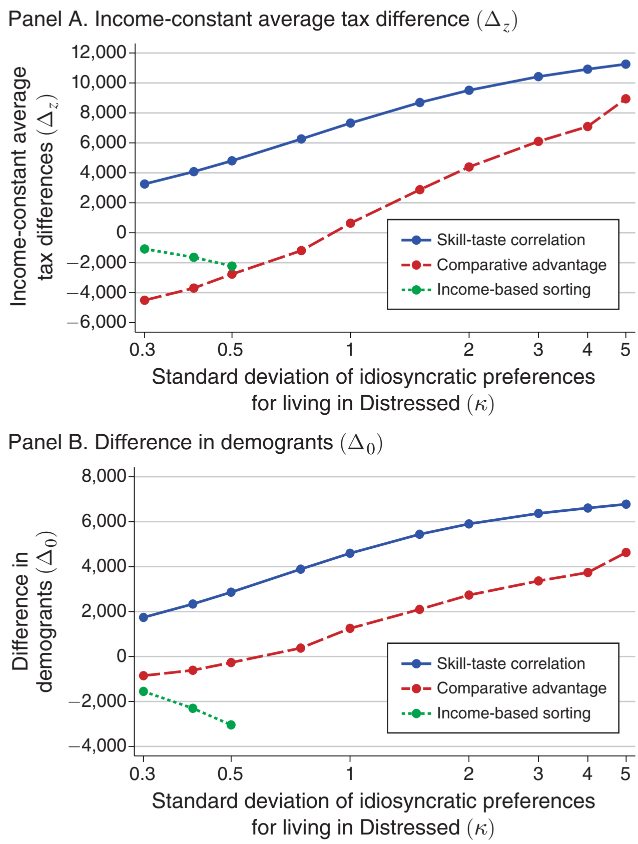

FIGURE 3. OPTIMAL PLACE-BASED REDISTRIBUTION BY DISPERSION OF PREFERENCES FOR DISTRESSED

Notes: This figure shows how summary measures of place-based redistribution depend on the standard deviation of idiosyncratic preferences for living in Distressed κ displayed on a log scale. Panel A shows the summary measure Δ_z of Elsewhere-minus-Distressed tax differences across all households. Panel B shows the Elsewhere-minus-Distressed difference Δ_0 in taxes on zero-earners only. Each panel depicts series for three theoretical scenarios: one in which skill-taste correlation is the only driver of sorting, one in which comparative advantage is the only driver of sorting, and one in which income effects (via rent differences across communities) are the only driver of sorting. Income-based sorting was only capable of rationalizing the target moments for a restricted set of κ values that imply relatively high mobility.

equity benefits of redistribution that can yield net transfers in either direction. When nonlinear instruments are available, the place-based transfer can be targeted to dampen the migration responses of particular income groups. As migration elasticities fall, the advantage of using nonlinear taxes to stem migration of high-income households fades. This phenomenon is apparent from the contrast between Figure 2 and Supplemental Appendix Figure 2: With high migration responses, MTRs at top incomes are larger in Distressed, a pattern that is reversed when migration responses are low.

F. *Decomposing MTRs*

Section VIC observed that sorting tends to generate lower MTRs in Distressed. However, Section VIIC found that comparative advantage generated higher MTRs in Distressed when $\kappa = 0.5$. To illuminate the economic forces driving spatial MTR

Table 3—Optimal Marginal Tax Rates at the Median Skill Type

	Distressed			Elsewhere		
	Marginal tax rate	Within-community component	Between-community component	Marginal tax rate	Within-community component	Between-community component
	(1)	(2)	(3)	(4)	(5)	(6)
Panel A. High migration: SD of idiosyncratic preferences for living in Distressed $\kappa = 0.5$						
Skill-taste correlation	0.479	0.246	0.234	0.510	0.514	−0.004
Comparative advantage	0.544	−0.111	0.655	0.509	0.521	−0.012
Income-based sorting	0.499	0.523	−0.027	0.510	0.509	0.000
Panel B. Low migration: SD of idiosyncratic preferences for living in Distressed $\kappa = 4$						
Skill-taste correlation	0.442	0.374	0.068	0.510	0.511	−0.001
Comparative advantage	0.446	0.232	0.214	0.510	0.514	−0.004

Notes: This table reports a decomposition of the optimal marginal tax rate for the median skill type in three theoretical scenarios: one in which skill-taste correlation is the only driver of sorting, one in which comparative advantage is the only driver of sorting, and one in which income effects (via rent differences across communities) are the only driver of sorting. Panel A reports simulation results for scenarios with κ set to 0.5, implying a higher level of migration. Panel B reports results for scenarios with κ set to 4, implying a lower level of migration. Panel B omits the income-based sorting row because the moments cannot be rationalized with nonnegative Distressed rent when κ is greater than approximately 0.55 columns 1–3 report results for Distressed, and columns 4–6 report results for Elsewhere. Columns 1 and 4 reports the marginal tax rate. Columns 2 and 4 report the component of the marginal tax rate attributable to an equity-efficiency tradeoff within communities. Columns 3 and 6 report the component of the marginal tax rate attributable to fiscal externalities arising from migration between communities. The marginal tax rate equals the within-community component plus the between-community component.

differences, we use equations (8) and (9) to decompose optimal MTR schedules into three components reflecting different planning objectives. A "within-community" component captures tradeoffs between equity and efficiency within communities (Mirrlees 1971; Saez 2001), while a second "between-community" component captures the fiscal externalities associated with migration. A third "landlord" component captures the welfare effects of redistributing between households and landlords.

For Distressed, the three MTR components are proportional to the following expressions:

$$\text{(Within)} \quad \frac{1+\eta_1^U(\theta)}{\eta_1^C(\theta)} \frac{\gamma_1(\theta)}{\theta f(\theta)\left[1-G_\theta(\phi_\theta)\right]} U_{c1}^*(\theta) \int_\theta^{\bar{\theta}} \frac{1-\lambda_1(s)}{U_{c1}^*(s)} \left[1-G_s(\phi_s)\right] dF(s)$$

$$\text{(Between)} \quad -\frac{1+\eta_1^U(\theta)}{\eta_1^C(\theta)} \frac{\gamma_1(\theta)}{\theta f(\theta)\left[1-G_\theta(\phi_\theta)\right]} U_{c1}^*(\theta) \Delta\tau^+(\theta)$$

$$\text{(Landlord)} \quad \frac{1+\eta_1^U(\theta)}{\eta_1^C(\theta)} \frac{\gamma_1(\theta)}{\theta f(\theta)\left[1-G_\theta(\phi_\theta)\right]} U_{c1}^*(\theta)(1-\lambda_L)\Delta r^+(\theta).$$

When scaled by one plus their sum, totaling these three expressions yields the optimal MTR schedule in Distressed. The corresponding expressions for Elsewhere are symmetric.

Table 3 reports the optimal MTR, the scaled within-community component, and the scaled between-community component for the median skill type (i.e., for θ

$= F^{-1}(0.5)\big)\big)$. The within and between components sum approximately to the average MTR because the omitted landlords component is nearly zero when $\lambda_L \approx 1$. Decompositions are reported for each sorting motive and for two choices of κ.

Column 2, row 2 of Table 3, panel A reveals that the standard within-community equity-efficiency tradeoff depresses the MTR of the median skill type in Distressed when $\kappa = 0.5$ and comparative advantage drives sorting. This finding arises because comparative advantage and high Distressed MTRs (Figure 2) at the optimum cumulate into high consumption differences at higher skill levels, which leads to few higher-skill types in Distressed. However, column 3 indicates that the between-community component pushes toward very high MTRs, consistent with each marginal mover to Distressed yielding a large negative fiscal externality. The two components combine to yield moderately higher MTRs in Distressed (column 1) than in Elsewhere (column 4).

In contrast, panel B of Table 3 reports a much smaller Distressed between-community component when $\kappa = 4$, reflecting the smaller fiscal externalities that arise at low levels of migration responsiveness. Lower Distressed MTRs at the optimum cumulate into lower average tax rate differences at higher skill levels, which leads to more high-skill types in Distressed and thus more revenue to be raised by high MTRs at middle skill levels. With less sorting at the optimum, the Distressed within-community component becomes positive and substantial. The two components sum to a Distressed MTR that is moderately lower than the Elsewhere MTR.

VIII. How Large Might Optimal Place-Based Transfers Be?

The previous section investigated the structure of optimal place-based transfers when a single sorting motive was at play. This section studies the size and shape of optimal place-based transfers when sorting is generated by a plausible mix of forces. The analysis proceeds under two alternate sets of assumptions corresponding to different sorts of place-based policies. We use the mean characteristics of the thirty urban and the ten rural Empowerment Zones (EZs), respectively, to anchor these calibrations.

The first scenario assumes that sorting is driven by income effects and skill-taste correlation. This "urban" calibration is meant to correspond to a setting where subsidies impact residential location choice within a city, with each skill type having access to identical wage opportunities regardless of their chosen neighborhood. Next, we consider a "rural" scenario where sorting is driven by income effects and comparative advantage. To the extent that skill-taste correlation is also an important contributor to sorting into rural EZs, neglecting this force will lead us to overstate the contribution of comparative advantage. As illustrated in Figure 3, misattributing sorting to comparative advantage rather than to skill-taste correlation should lead to an underestimate of the true optimal level of redistribution to rural areas.

A. *Urban Baseline Parameterization*

Urban EZs cover 1.7 percent of the US population in the 2016–2020 ACS. We use recent census-tract-level estimates by Baum-Snow and Han (2024a,b) to set Elsewhere's housing supply elasticity ϱ_0 to 0.34 (the nonurban-EZ mean) and Distressed's elasticity ϱ_1 to 0.24 (the urban EZ mean).

Elsewhere's housing supply intercept $\underline{H}_0$ is chosen to ensure that when Elsewhere covers 98.3 percent of the population Elsewhere's rent r_0 is \$7,284, the twentieth percentile US rent, which roughly corresponds to the median of the 39 percent of households earning under \$50,000 nationwide in the 2016–2020 ACS. Distressed's housing supply intercept $\underline{H}_1$ is chosen to ensure that when Distressed covers 1.7 percent of the population r_1/r_0 equals 0.86: the ratio of the median rent in urban EZs to median rent in the rest of the country according to 2016–2020 ACS tract-level aggregates.[10]

The parameters (μ, W, β) are chosen to match the three empirical moments introduced in the previous section. The standard deviation of location preferences κ is set to yield an elasticity of Distressed population with respect to Distressed wages equal to the 0.82, which is the value estimated empirically for urban EZs by Busso et al. (2013).[11] In this exercise, the skill-taste-correlation parameter β governs the overrepresentation of low incomes in Distressed beyond that which is explained by income effects.

The calibration is performed under an approximation of the current (place-blind) tax system, which we empirically estimate using Piketty, Saez, and Zucman (2018a,b)'s microfiles aggregated across years 2016–2020, each of which is inflated to 2020 US dollars using the CPI-U. Finally, we continue to set $\omega_H(\theta) = 1$ for all θ and to choose ω_L to ensure λ_L equals one at the symmetric benchmark described in the previous section. Additional details on the calibration are described in Supplemental Appendix C.

Panel A of Table 4 displays the baseline results. The calibrated value of κ is 0.44, close to the 0.5 value used in the illustrative simulations of panel A of Table 2. At the optimum, residents of Distressed enjoy an average place-based transfer Δ_z of \$3,143, which is approximately two-thirds of the optimal value reported in panel A of Table 2 under the slightly higher κ and when skill-taste correlation drives all sorting. Distressed residents enjoy a larger demogrant Δ_0 of \$1,462, implying that just over half of the average place-based transfer arises through lower marginal tax rates.

By comparison, actual EZs provide a slightly larger transfer of \$3,000 for all eligible full-time-employed residents, which suggests that the magnitude (but not the capped nature) of the urban EZ transfers may be close to optimal. However, actual EZs involved additional parameters whose optimality we cannot assess using our theoretical framework.

B. *Robustness: Alternative Economic Assumptions*

The remaining rows of panel A of Table 4 repeat the baseline specification under alternative scenarios. In each row, we recalibrate the model by changing either the value of some parameter or the value of some targeted moment. The first two rows vary

[10] We use the ratio of median rents rather than twentieth percentile rents because quantiles other than the median are not available in the tract level tabulations needed to aggregate to urban EZs.

[11] EZs offer a 20 percent wage subsidy to zone jobs for zone residents, implying a reduction in the net of tax rate of approximately $\ln(1.2) = 0.182$. Busso, Gregory, and Kline (2013, Table 10) report that EZs increased local jobs held by zone residents by 15 log points, implying a behavioral elasticity of $0.15/0.182 = 0.82$. Note however that the EZ wage credits only affected the subset of zone residents who also worked in the zone and that we have abstracted from the subsidy's \$3,000 cap and from the program's local block grant. These omissions likely bias the elasticity in opposite directions.

Table 4—How Large Might Optimal Place-Based Transfers Be?

	Income-constant average tax differences, Δ_z (1)	Difference in demogrants, Δ_0 (2)	SD of idiosyncratic preferences for living in Distressed, κ (3)	Skill-taste correlation, β (4)	Comparative advantage, γ_1 (5)
Panel A. Urban scenarios					
Urban baseline	3,143	1,462	0.44	0.61	1.000
1/2x migration	7,655	4,420	1.52	2.48	1.000
2x migration	−383	−284	0.09	−0.02	1.000
No rent differences	3,265	1,779	0.30	0.51	1.000
1.5x rent differences	2,917	1,139	0.49	0.64	1.000
Swap housing elasticities	4,256	2,137	0.62	0.93	1.000
75% weight on landlords	1,846	236	0.44	0.61	1.000
Panel B. Rural scenarios					
Rural baseline	4,329	532	4.06	0.00	0.900
1/2x migration	6,906	1,496	8.23	0.00	0.885
2x migration	573	−1,755	1.99	0.00	0.900
No rent differences	8,841	4,311	4.32	0.00	0.874
1.5x rent differences	2,238	−1,481	3.95	0.00	0.904
Swap housing elasticities	3,721	−68	3.97	0.00	0.900
75% weight on landlords	5,127	1,154	4.06	0.00	0.900

Notes: This table reports optimal place-based transfers across scenarios. Columns 1 and 2 show our measures of place-based redistribution: the summary measure Δ_z of Elsewhere-minus-Distressed tax differences across all households, and the Elsewhere-minus-Distressed difference Δ_0 in taxes on zero-earners only. Columns 3–5 report key calibrated parameters. Panel A reports results from an "urban" baseline scenario that assumes sorting is driven by income effects and skill-taste correlation, assumes Distressed housing is supplied with elasticity $\varrho_1 = 0.24$, and targets a migration elasticity of 0.82, a Distressed-to-Elsewhere rent ratio of 0.86, and a share of Distressed households earning under \$50,000 of 56 percent. Panel B reports results from a "rural" baseline scenario that assumes sorting is driven by income effects and comparative advantage, assumes Distressed housing is supplied with elasticity $\varrho_1 = 0.60$, and targets a migration elasticity of 0.20, a Distressed-to-Elsehwere rent ratio of 0.54, and a share of Distressed households earning under \$50,000 of 60 percent. The migration scenarios target half or twice the assumed baseline migration elasticity. The rent scenarios set the Distressed housing supply shifter to yield no rent difference or 50 percent greater rent difference with Elsewhere. The Swap housing elasticities scenario sets the Elsewhere housing supply elasticity ϱ_0 equal to the baseline Distressed elasticity and set the Distressed elasticity $\varrho_1 = 0.34$. The 75 percent weight on landlords scenario reduces the value of landlord weight ω_L by 25 percent so that the social planner at the symmetric benchmark in Figure 2 values a marginal dollar to landlords three-quarters as much as a marginal dollar to households. See Supplemental Appendix Table 2 for all simulation parameters underlying these scenarios. See Supplemental Appendix Table 3 for additional scenarios that vary economic characteristics of Distressed.

the migration target to either half or twice the baseline urban EZ migration elasticity, yielding different calibrated values for κ. The next two rows set Distressed rent equal to either 72 percent of Elsewhere rent or 100 percent. The greater the rent differential, the more sorting is driven by income effects and the less it is driven by skill-taste correlation. The next two rows halve or double the Distressed housing supply elasticity.

Optimal place-based transfers to Distressed rise to \$7,655 when the target migration elasticity is doubled and become slightly negative when it is halved. Varying the rent has offsetting effects. For example, while eliminating rent differences increases the skill-taste correlation needed to explain sorting and thus pushes toward greater place-based transfers, it also raises migration responsiveness (lowers κ) which tempers place-based transfers. Making Distressed housing supply relatively elastic rather than inelastic increases place-based transfers by about \$1,000. As detailed in Supplemental Appendix Table 3, optimal place-based transfers are relatively sensitive to the low-income share of households in Distressed but not to the size of Distressed.

C. *Robustness: Alternative Weight on Landlords*

Thus far, the landlord weight ω_L has been chosen to ensure the planner is indifferent about redistribution between landlords and households. Nevertheless, landlord incidence has been an important indirect feature of all our results, as the previous subsection's housing elasticity result showed.

The final row of panel A of Table 4 reduces the value of ω_L by 25 percent so that $\lambda_L = 0.75$ at the symmetric benchmark in Section VIIA. The value 0.75 approximately equals the ratio of the marginal utility of consumption of a household at the 82nd percentile of the skill distribution to that of the average household at the place-based optimum. We choose the 82nd percentile because it is the US real-estate-ownership-weighted-mean income percentile in the 2016–2020 Piketty, Saez, and Zucman (2018a,b) microfiles.

Placing a 75 percent weight on landlords relative to households reduces optimal place-based transfers to Distressed by about \$1,000. In the urban baseline, Distressed housing is less elastically supplied than Elsewhere housing. As a result, $r_1/\varrho_1 - r_0/\varrho_0 > 0$ in equations (8)–(10), implying the planner has a motive to move households to Elsewhere in order to reduce aggregate rent.

D. *Rural Parameterization*

To conclude, we examine optimal place-based transfers to or from areas where local productivity levels are lower. In this calibration, wages are lower in Distressed, and the overrepresentation of high-skilled households in Elsewhere stems, in part, from a spatial comparative advantage in production. We refer to these specifications as "rural" EZ parameterizations because productivity differences between distressed rural counties and the rest of the country are especially plausible.

Distressed's housing supply intercept $\underline{H}_1$ is chosen to achieve a rent ratio r_1/r_0 of 0.54, the ratio of the median rent in rural EZs to median rent in the rest of the country according to 2016–2020 ACS tract-level aggregates. Distressed's housing supply elasticity ϱ_1 is set to 0.60, the rural EZ mean in census-tract-level estimates by Baum-Snow and Han (2024a,b), while Elsewhere's elasticity ϱ_0 is preserved at 0.34.

Skill-taste correlation is set to zero and the parameters (μ, W, γ_1) are chosen to match the following three empirical moments drawn from the 2016–2020 ACS: (i) Distressed covers 1.7 percent of the population, as in the urban calibrations; (ii) 39 percent of households nationwide earn under \$50,000, as in the urban calibrations; and (iii) 60 percent of Distressed residents earn under \$50,000, as rural EZs are lower income than urban EZs. The migration elasticity moment is drawn from Sprung-Keyser, Hendren, and Porter (2022), who report an elasticity of commuting zone population with respect to wages of 0.20.[12] The smaller migration elasticity accords with rural EZs being larger than urban EZs (Kleven et al. 2020).

The first row of panel B of Table 4 reports the results for the rural baseline. The calibrated value of κ is 4.06, similar to the $\kappa = 4$ simulations of panel B of

[12] Sprung-Keyser, Hendren, and Porter (2022) study commuting zones which, much like rural EZs, are collections of counties or large parts of counties. They estimate that an approximately 3 percent increase in local wages causes an average increase in local population of approximately 0.6 percent.

Table 5—Crosswalk from Urban Baseline to Rural Baseline

Scenario	Income-constant average tax differences, Δ_z (1)	Difference in demogrants, Δ_0 (2)	SD of idiosyncratic preferences for living in Distressed, κ (3)	Skill-taste correlation, β (4)	Comparative advantage, γ_1 (5)
Urban baseline	3,143	1,462	0.44	0.61	1.000
+ migration moment from rural baseline	9,870	5,612	3.85	6.46	1.000
+ calibrate γ_1 instead of β	6,402	3,227	3.81	0.00	0.909
+ rent moment from rural baseline	2,780	−450	3.89	0.00	0.916
+ sorting moment from rural baseline	4,140	457	3.82	0.00	0.900
+ housing supply elasticities from rural baseline	4,329	532	4.06	0.00	0.900

Notes: This table begins with the urban baseline results of Table 4, panel A and progressively alters the targeted moments or the assumed Distressed housing supply elasticity in order to yield the rural baseline results of Table 4, panel B. The second row replaces the migration elasticity target of 0.82 with 0.20. The third row calibrates comparative advantage γ_1 instead of skill-taste correlation β to match the moments. The fourth row calibrates $\underline{H}_1$ to achieve a Distressed-to-Elsewhere rent ratio of 0.54 instead of 0.86. The fifth row targets a Distressed share of households earning under \$50,000 of 60 percent instead of 56 percent. The sixth row replaces the Distressed housing supply elasticity of 0.24 with 0.60. The columns are the same as those in Table 4; see the notes to that table for details.

Table 2. At the optimum, Distressed residents receive an average place-based transfer of \$4,329, most of which arises from lower MTRs in Distressed. The average place-based transfer is lower than that found in panel B of Table 2 when comparative advantage exclusively drove sorting under a similar value of κ, rather than the rural baseline's combination of comparative advantage and income-based sorting. Lower MTRs in Distressed were also observed and discussed in the comparative advantage case of panel B of Table 2.

The remaining rows of panel B of Table 4 report the alternative scenarios analogous to those discussed above for the urban exercise. Doubling the migration elasticity yields near-zero optimal place-based transfers on average. Contrary to the urban exercise, placing 75 percent weight on landlords yields approximately \$1,000 greater optimal place-based transfers to Distressed. Unlike in the urban scenario, Distressed in the rural scenario enjoys greater housing supply elasticity than Elsewhere. As a result, $r_1/\varrho_1 - r_0/\varrho_0 < 0$ in equations (8)–(10). Thus, the planner redistributes away from landlords by using place-based transfers to shift more households to Distressed.

Table 5 provides a crosswalk between the urban and rural baselines by altering key moments and parameters in succession. Starting from the urban baseline, matching the lower migration response from the rural baseline triples the optimal place-based transfer to Distressed. Subsequently replacing skill-taste correlation with comparative advantage reduces optimal place-based transfers halfway back to the urban baseline. Additionally altering the Distressed housing supply shifter to match the rural baseline's lower Distressed rent has two effects: It increases income-based sorting and it reduces the marginal utility of consumption in Distressed especially at the bottom. This combination yields attenuated place-based transfers to Distressed on average and a small place-based transfer to Elsewhere at the bottom. Finally, matching the rural baseline's higher sorting moment increases comparative advantage and nearly yields the rural baseline's average place-based transfer, with the remaining difference accounted for by the Distressed housing supply elasticity from the rural baseline.

IX. Conclusion

This paper has found that place-blind taxation is generally suboptimal in a spatial equilibrium model with idiosyncratic locational preferences. The optimal location-specific tax systems are strongly influenced by the economic motives generating this sorting. When sorting is generated by skill-taste correlation, location serves as a valuable proxy for skill that motivates spatially targeted transfers to Distressed communities. When sorting is driven by productive comparative advantage, spatial transfers will tend to be optimal but their direction depends on the nature and strength of migration responses to taxation. While migration elasticities are already a standard estimand in the empirical literature on place-based policies, little work exists exploring heterogeneity in migration responses by income level, which is a key determinant of the magnitude of fiscal externalities. More work exploring the characteristics, motives, and earnings changes of marginal (as opposed to average) movers would be valuable for future quantitative policy assessments.

Finally, the scope for spatial targeting to improve on place-blind taxation hinges critically on the degree of sorting present in an economy. Mean income has been diverging across US states and counties for decades. In recent years, much of this pattern is driven by rising concentration of high income households (Gaubert et al. 2021). An interesting subject for future research is understanding the forces generating these trends. Quantitative evidence on this question would help to inform whether the potential gains from spatial targeting of top tax rates have grown relative to the gains from spatial targeting of antipoverty programs.

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