Place-Based Policies: Lessons from Theory*

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Abstract

We revisit the rationale for place-based policies using a canonical urban framework with agglomeration spillovers. We obtain six main results. First, the spatial allocation is inefficient even when spillover elasticities are constant across regions. Second, under constant and positive spillover elasticities, the optimal policy is a national wage subsidy funded by a lump sum tax, reallocating activity towards higher wage locations. Third, more generally, a region's optimal labor subsidy rate equals its spillover elasticity. Fourth, place-based policies that favor low-wage locations on efficiency grounds are justified when density has negative spillover effects, spillover elasticities are higher in low-wage locations, or across-skill spillovers favor more mixing in low-wage locations. Fifth, government spending on infrastructure, investment incentives, or housing policies cannot fully correct externalities from labor density. Sixth, housing supply elasticities do not affect the design of first-best place-based policies targeting agglomeration spillovers.

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1 Introduction

Regional economic disparities are the norm rather than the exception, driven by factors like geographic specialization, historical development patterns, and structural shifts such as the rise of the knowledge economy, the decline of manufacturing, and globalization. Governments often view regional inequalities in income and employment as a concern. A series of growing challenges –such as declining economic opportunities and public services in lagging regions, and high housing costs in thriving areas– have renewed policymaking interest in *place-based policies*. Widely varying in form, these policies have in common that they target specific locations rather than people.

When can place-based policies enhance welfare? Broadly speaking, there are two key justifications. First, they can be justified on efficiency grounds if they address market failures, such as underinvestment in local public goods or missed productivity gains from agglomeration spillovers. Second, they may be warranted on equity grounds even when market failures are not present. By directing resources to lagging areas, they serve as tools to reduce regional inequality. In both cases, however, resources directed to workers or investment in a targeted region come at the expense of alternative uses elsewhere. These shadow costs may erode or even outweigh the intended social gains.

In this paper, we ask: when are place-based policies justified according to standard economic theory? We derive several results within the canonical spatial equilibrium framework that is widely used by urban economists. Our primary focus is on the efficiency rationale for place-based policies, but we also discuss some key considerations in the case of equity-driven policies.

Whenever the spatial concentration of economic activity generates externalities, usually referred to as *agglomeration effects* or *spatial spillovers*, classic Pigovian reasoning suggests that government intervention may be warranted to restore efficiency. Nevertheless, an influential hypothesis in the literature holds that spatial equilibria are efficient in a benchmark where agglomeration elasticities are constant across space (Glaeser and Gottlieb, 2008; Kline and Moretti, 2014a).[1] This result would imply that no intervention is desirable unless the spillover elasticity varies across locations.[2] Recent work, however, shows that policy intervention can improve efficiency even when spillover elasticities are constant (Fajgelbaum and Gaubert, 2020): what matters is not just the agglomeration elasticity but the dollar value of net agglomeration benefits, which depends jointly on the elasticity and the level of labor productivity.[3] When spillover elasticities are constant across space and positive, the gains from stronger agglomeration in high-productivity areas exceed the losses from weaker agglomeration elsewhere.

This result holds in standard spatial equilibrium models in which a federal government can

[1]See also literature reviews by Neumark et al. (2015) and Duranton and Venables (2018).

[2]By "spillover elasticity" we mean the percentage increase in worker productivity (or in amenities enjoyed by residents) following a 1 percent increase in local population.

[3]The key difference between the previous hypothesis from the literature and Fajgelbaum and Gaubert (2020) is that the former assessed efficiency in restricted versions of the spatial model that omitted transfers across locations, whereas the latter incorporates spatial transfers in the equilibrium definition and in the instruments available to the planner.

optimally implement transfers across locations. It applies broadly, from early public-finance models (Flatters et al., 1974) to recent quantitative spatial frameworks (Rossi-Hansberg et al., 2019), and is robust to a range of modeling assumptions about land ownership, housing supply elasticities and input-output structure. An important caveat, however, is that these efficiency results require the absence of other pre-existing distortions, such as local housing market frictions.

Place-based interventions motivated by equity concerns have also faced some skepticism, the main argument being that redistributing to individuals rather than locations is more efficient to tackle inequality (a view summarized in Glaeser, 2008). However, Gaubert et al. (2024) show that place-based redistribution can be justified when location serves as an effective tagging mechanism if policies cannot perfectly target individuals.

A second theme in this chapter is that the canonical spatial economic model, with agglomeration spillovers only, does not imply that reallocating towards lagging regions enhances efficiency. The key factor determining the direction of efficient reallocation is the marginal value of further clustering. Under standard assumptions, these benefits tend to be larger in richer and more productive regions. This general result may explain why economic theory and policy practice have often spoken past each other. However, we argue that more complex spillover structures –impacting negatively on amenities or varying across labor types–, can easily reverse this result, thus providing a theoretical rationale for reallocating towards poorer regions based on efficiency rather than distributional grounds.

A third aspect of our analysis concerns the effectiveness of investment incentives as a tool for place-based policies. The analysis of first-best policies, which we follow, is strongly disciplined by the "principle of targeting": if the labor allocation is distorted, labor subsidies (either to labor demand or labor supply) suffice to restore efficiency. Incentives for other factors—such as capital—are unnecessary. Our framework accounts for spillovers stemming from both labor and capital density, and our analysis shows that the optimal policies addressing each source of agglomeration are fully independent. For example, if there are only labor density spillovers, then capital investment incentives are optimally zero. For the same reasons, housing interventions are not required to achieve first-best outcomes and housing supply elasticities do not influence the design of optimal policies targeting spillovers. Importantly, our discussion focuses on first-best policies; in principle, investment incentives or housing policies could be useful in a second-best context with pre-existing distortions or limited tools to reallocate labor.

The rest of the paper is structured as follows. Section 2 examines place-based policies that aim to restore efficiency within a canonical urban model. Section 3 explores conditions under which place-based policies may be optimally targeted at lower-wage regions. Section 4 distills six key results from this analysis, and section 5 concludes.

2 Place-Based Policies for Efficiency in a Canonical Urban Model

Place-based policies designed to promote local development broadly fall into two main categories: investment subsidies and employment subsidies. Investment subsidies may include tax breaks, grants, or public infrastructure funding to develop capital. A well-known example is the Tennessee Valley Authority, a federally-funded New-Deal era policy aimed at modernizing infrastructure in the southeastern U.S. (Kline and Moretti, 2014a). Employment subsidies are often implemented via hiring subsidies incentivizing firms to hire in distressed areas (Slattery and Zidar, 2020). A prominent example in the U.S. is the Empowerment Zones program (Busso et al., 2013), offering tax credits to businesses that hire within designated zones, with similar enterprise zone programs across the E.U. for instance (Ehrlich and Overman, 2020). More broadly, all taxes and subsidies that vary across space may in practice act like place-based policies by fostering local activity. Examples include federal income taxes (Albouy, 2009; Colas and Hutchinson, 2021), state taxes (Fajgelbaum et al., 2018), and place-specific components of welfare benefits.

We study investment and employment subsidies in a canonical urban model with spillovers from agglomeration. In the model, the concentration of labor or infrastructure generates externalities. Therefore, capital and labor are not optimally allocated spatially by market forces. We use the model to identify policies that enhance welfare around an observed allocation as well as policies that implement the optimal allocation.

Consider an economy where production takes place in J cities or regions. In each region, competitive firms produce final output using labor L_j and infrastructure I_j. This output is freely traded between regions. In region j, the firms' production function is $Y_j = A_j F_j\left(z_j L_j, I_j\right)$. Labor productivity in region j is z_j, while TFP is A_j. Infrastructure I_j is produced locally by competitive construction firms using the traded good as an input. These firms charge a price p_j equal to the marginal cost of infrastructure.

Market failures arise from two channels. First, the productivity of workers z_j can be subject to an agglomeration spillover whereby labor productivity increases with the density of local employment, i.e., $z_j'\left(L_j\right) > 0$. This dependence of labor productivity on density is a central force in urban economics. It is one of the main reasons why cities exist (Henderson, 1974). An extensive body of research estimates the extent of such agglomeration effects (see Combes and Gobillon (2015) for a review). This spillover is not taken into account by firms when making their hiring decision. Second, TFP may depend on the level of local infrastructure, i.e. $A_j'\left(I_j\right) > 0$. Infrastructure investments (like transport, water, or energy) have efficiency impacts that exceed their returns to private suppliers. Large sunk costs in infrastructure also imply increasing returns, which are present in this framework. Increasing returns and under-provision of infrastructure is a standard motivation for public provision or regulation of private utilities.

In the model, these two spillovers are conveniently summarized by the following "spillover elasticities":

$$\gamma_j^L\left(L_j\right) \equiv \frac{\partial z_j/\partial L_j}{z_j/L_j} \text{ and } \gamma_j^I\left(I_j\right) \equiv \frac{\partial A_j/\partial I_j}{A_j/I_j}\left(\frac{\partial F_j/\partial I_j}{F_j/I_j}\right)^{-1}. \quad (1)$$

The first elasticity is that of labor productivity with respect to labor in region j, while the second one is that of TFP with respect to infrastructure in region j, normalized by the elasticity of output to infrastructure. This normalization accounts for the fact that private suppliers do internalize part of the benefit of infrastructure when they invest. In principle, these elasticities can be variable both across locations and as a function of local scale. We discuss below a special case that plays an important role in the literature, in which spillovers elasticities are uniform across regions.

Workers in j derive utility $u_j(c_j, h_j)$ from consumption of the traded good c_j and housing h_j. For simplicity of exposition housing is assumed to be in fixed supply in each location, but this plays no role in any of the results. The utility function is indexed by location j to allow for the possibility that worker's utility depends on amenities that are specific to their place of residence. Labor is mobile across regions, so that workers' utility is equalized across regions. Workers' income includes labor income w_j as well as unearned income π, their claim to aggregate firms' profits and land ownership.[4] Labor income w_j is the workers' private marginal product of labor, which takes productivity as given.[5]

A federal government can use two policies:

$$\text{Investment subsidy in } j : s_j^I,$$
$$\text{Hiring subsidy in } j : s_j^L.$$

The infrastructure investment subsidies s_j^I are such that the price of infrastructure for firms in j is $p_j - s_j^I$, and the hiring subsidies s_j^L are such that their labor costs are $w_j - s_j^I$.[6] We assume that a lump-sum tax t paid by all workers finances these subsidies. The federal budget is balanced, so that:

$$\sum_j s_j^I I_j + \sum_j s_j^L L_j = tL.$$

2.1 Welfare-Enhancing Reallocations

Consider a market allocation where some government subsidies are already in place. To determine whether these subsidies are well targeted, we ask if there are reallocations of labor or infrastructure investments that can raise welfare. If that is the case, changes to existing subsidies incentivizing these reallocations would be desirable.

Concretely, suppose that ΔL_j additional workers and ΔI_j additional infrastructure are allocated to j. In this thought experiment, aggregate constraints have to hold –in particular, total population is fixed, so other locations have to see a decrease. To a first order approximation, the impact on

[4]The literature has considered alternative ownership assumptions, including absentee landowners and workers' ownership of *local* firms and land. We show in Appendix A.3 that the results obtained under our baseline assumption extend to these cases. Allowing for a landowner class creates distributional issues; the distributional implications of place-based policies are discussed in Section 4.

[5]I.e., $w_j = \frac{\partial Y_j}{\partial L_j} = A_j \frac{\partial F_j(z_j L_j, I_j)}{\partial (z_j L_j)} z_j$.

[6]We assume throughout that spatial distortions to the supply of infrastructure are tackled by infrastructure subsidies for local firms. Spatial efficiency can also be also achieved by subsidizing the supply of infrastructure. For example, suppliers may price below marginal cost and be compensated in a lump-sum fashion for their losses.

welfare of these reallocations is as follows:

$$\text{Welfare Gain from Reallocations} = \sum_j \left(\Gamma_j^L - s_j^L\right) \Delta L_j + \sum_j \left(\Gamma_j^I - s_j^I\right) \Delta I_j, \tag{2}$$

where

$$\Gamma_j^L \equiv \gamma_j^L \left(w_j - s_j^L\right) \text{ and } \Gamma_j^I \equiv \gamma_j^I \left(p_j - s_j^I\right). \tag{3}$$

The term Γ_j^L in (3) measures the productivity spillovers created by adding a worker to location j. It equals the spillover elasticity multiplied by the (private) marginal product of labor, in turn equal to the marginal hiring cost for firms.[7] Similarly, Γ_j^I measures the spillovers generated by additional infrastructure, again equal to the spillover elasticity multiplied by the (private) marginal product of infrastructure, in turn equal to the marginal building cost.

With these definitions, expression (2) is intuitive. The term $\Gamma_j^L - s_j^L$ is the net effect on welfare of adding a worker to location j. Adding a worker to j generates positive spillovers, represented by Γ_j^L, but incurs a cost to the government, s_j^L, in subsidies. Similarly, $\Gamma_j^I - s_j^I$ is the net welfare effect of marginally increasing infrastructure in location j. This investment raises TFP for all firms (measured by Γ_j^I) but comes at a cost s_j^I to the government.

The formula highlights two sufficient statistics for inferring which reallocations would improve welfare in the model, and for testing whether an observed allocation is efficient. First, consider labor reallocations, specifically a reallocation of a small number of workers from location i to location j ($\Delta L_i = -\Delta L_j$). A policy that induces this reallocation, while keeping the number workers and the level of infrastructure constant in all other locations, is desirable whenever

$$\Gamma_j^L - s_j^L > \Gamma_i^L - s_i^L. \tag{4}$$

Expression (4) indicates the direction of desirable labor reallocations based on terms that can, in principle, be estimated and measured in an observed equilibrium. In particular, from the definition of Γ_j^L, it follows that in a *laissez-faire* equilibrium without pre-existing subsidies, reallocations to locations with higher wages and higher spillover elasticities increase welfare relative to the status quo (assuming agglomeration effects are positive). By contrast, the reallocations driven by a wide range of real-world place-based policies tend to favor lower-wage locations. In cases with more general spillovers, such as congestion (discussed later in the article), a rationale for reallocating to poorer locations arises. Condition (4) also has a quantitative interpretation, as it ranks location by where an additional worker would provide the most value.

A second sufficient statistic relates to the allocation of infrastructure investment. A policy that marginally increases infrastructure in location j while keeping infrastructure everywhere else constant and financing this increase by reducing final consumption is welfare-enhancing whenever:

$$\Gamma_j^I - s_j^I > 0. \tag{5}$$

[7] Had we defined s_j^L as a personal income subsidy received by residents of j rather than as a hiring subsidy, then equation (2) would have looked identical but with $\Gamma_j^L \equiv \gamma_j^L w_j$, as in this case the (private) marginal product of labor would have been the wage paid by firms.

In a *laissez-faire* equilibrium, it is efficient to increase infrastructure when either its spillover elasticity or its marginal cost is high. Although the presence of marginal cost in this expression may seem counterintuitive, the logic parallels that for labor: a high private marginal cost reflects a high private marginal product, which drives the spillover value of reallocations. The left-hand side of condition (5) also provides a ranking of locations where marginal infrastructure increases would be most valuable.

2.2 Optimal Policies

The discussion so far has addressed the question: around an observed allocation, considering small changes, which places should expand in employment or infrastructure to increase efficiency? We now turn to a different question: what is the the optimal distribution of subsidies, according to the model? These optimal subsidies could differ significantly from the observed equilibrium, potentially leading to large reallocations. In that case, the first-order approach applied so far, while useful for understanding the optimal direction of small reallocations, might poorly approximate the optimal direction and magnitude of large reallocations. A location could offer the highest returns to an additional dollar of subsidies but might not receive the largest subsidies at the global optimum.

Expressions (4) and (5) can be used to find the optimal subsidies. At an optimal allocation, it should not be possible to find any welfare-improving reallocations of labor or infrastructure. According to (4), this requires that $\Gamma_j^L - s_j^L$ be equalized across locations. Likewise, (5) implies that $\Gamma_j^I - s_j^I = 0$ in all locations. Thus, the optimal allocation can be implemented with hiring subsidies s_j^{L*} and infrastructure subsidies s_j^{I*} such that:

$$s_j^{L*} = \Gamma_j^{L*} = \frac{\gamma_j^{L*}}{1+\gamma_j^{L*}} w_j^*, \qquad \forall j \tag{6}$$

$$s_j^{I*} = \Gamma_j^{I*} \equiv \frac{\gamma_j^{I*}}{1+\gamma_j^{I*}} p_j^*, \qquad \forall j \tag{7}$$

combined with a tax lump sum tax t^* paid by all firms to ensure government budget balance:

$$t^* = \frac{1}{L}\sum_j \frac{\gamma_j^{L*}}{1+\gamma_j^{L*}} w_j^* L_j^* + \frac{1}{L}\sum_j \sum_j \frac{\gamma_j^{I*}}{1+\gamma_j^{I*}} p_j^* I_j^*. \tag{8}$$

In all these expressions, an asterisk denotes that the variable is evaluated at the optimal allocation. Recall that the spillover elasticities, in particular, may vary with the labor and infrastructure allocations.

Equations (6)-(7) show that the dollar value of optimal subsidies equals the value of the spillovers.[8] Hence, spatial policies are not special: similar to any policy addressing externalities, place-based policies correct urban spillovers through an intuitive Pigouvian subsidy. Another intuitive takeaway is that the optimal way to address spillovers from labor density is with labor subsidies. It is not optimal to tackle labor-driven agglomeration externalities by incentivizing capital

[8] As Fajgelbaum and Gaubert (2025) demonstrate, the same outcome can be achieved with a wage subsidy directed to workers rather than to firms. Similarly, subsidies applied to the supply side of infrastructure, rather than the demand side, can achieve the optimal provision of infrastructure.

accumulation in the region. Infrastructure development subsidies are optimal only when addressing spillovers specifically tied to infrastructure.

How can one compute the optimal place-based policies (6)-(7)? Recall that the wages w_j^* and spillover elasticities γ_j^{L*} and γ_j^{I*} entering these expressions are evaluated at the optimal allocation, and therefore are not directly observable. In principle determining these policies requires quantifying and solving the full model to identify the optimal solution. However, this difficulty disappears in one important case – when spillovers have constant elasticity. We analyze this case next.

2.3 The Case with Constant Elasticity Spillovers

We assume here that spillover elasticities are constant, as a function of employment and infrastructure as well as across space:

$$\gamma_j^L = \gamma^L \text{ and } \gamma_j^I = \gamma^I. \tag{9}$$

A first question is whether, in this case, the *laissez-faire* allocation, with zero subsidies, is efficient. The dollar value of spillovers to be corrected by subsidies is given by:

$$\Gamma_j^L = \gamma^L w_j. \tag{10}$$

Without government intervention, the dollar-value of these spillovers, Γ_j^L, varies across locations because wages generally differ across space. According to (4), there are gains from reallocating labor from location i to j if

$$\gamma^L (w_j - w_i) > 0. \tag{11}$$

Thus, if the spillover γ^L is positive, then starting at the zero-subsidies allocation it is desirable to reallocate workers from low- to high-wage locations. Intuitively, high-wage locations generate larger spillovers, so a worker in a low-wage location would contribute more to social welfare if relocated to a high-wage location.

Similarly, it is optimal from a theoretical perspective to distort infrastructure investment. For example, assuming a constant-elasticity production function $Y_j = A_j \left((z_j L_j)^\alpha I_j^{1-\alpha} \right)^\beta$ and a TFP that grows with infrastructure at a constant elasticity: $A_j = A_j^0 I_j^{\gamma^A}$ with $\gamma^A > 0$, the sufficient statistics for efficient infrastructure allocation is:

$$\Gamma_j^I = \frac{\gamma^A}{(1-\alpha)\beta + \gamma^A} p_j > 0. \tag{12}$$

Starting from the no-subsidies allocation, an additional unit of infrastructure is most valuable in regions where its marginal cost p_j is higher, since a higher marginal cost reflects a higher marginal product.

According to (6) and (7), when spillover elasticities are constant the optimal subsidies take a simple form and can be computed without solving the full model. The optimal per-worker subsidy s_j^{L*} and per-unit infrastructure subsidy s_j^{I*} can be implemented through proportional wage and cost subsidies: firms receive a subsidy equal to $\frac{\gamma^L}{1+\gamma^L}$ of the prevailing wage rate and $\frac{\gamma^I}{1+\gamma^I}$ of infrastructure costs. Why does a constant-rate subsidy across space impact workers' location choices in the model?

The key reason is that the constant-rate subsidy is coupled with a lump-sum tax, meaning workers' net earnings become $\frac{\gamma^L}{1+\gamma^L} w_j - t$ rather than w_j in the absence of the policy. The net transfer received by a worker in a high-wage location is therefore higher as a share of income compared to a lower-wage location.[9] On net, this scheme benefits more workers in high-wage locations, incentivizing migration to these areas. Unlike in the case with non-constant elasticities, the optimal subsidy rates can be directly estimated at the observed (rather than optimal) equilibrium because the spillover elasticities observed in the current equilibrium remain valid at the optimal one.

Taking stock, we conclude that welfare-enhancing reallocations driven by positive agglomeration spillovers around a competitive allocation do not point at poor or small locations as being the natural target of place-based policies. In fact, at least for labor subsidies, it is high-wage locations that are under-developed in the *laissez-faire* allocation, according to the model. We discuss more general spillovers that can justify optimal reallocations into low-wage locations in the next section.

3 When do Optimal Place-Based Policies favor Low-Wage Regions?

The discussion so far has focused on the policy implications of agglomeration spillovers that impact productivity. Assuming the long-held view that these spillovers are positive, optimal transfers flow from low- to high-wage locations, both under the free-market allocation and at the optimal allocation. This conclusion aligns with place-based programs—such as business tax incentives for large firms and subsidies for technology hubs— that primarily benefit higher-wage areas. However, it appears at odds with the structure of many observed place-based policies (e.g., enterprise zones programs) that typically direct transfers to poorer areas.

Our analysis thus far has included two significant restrictions. First, we imposed several constraints on the nature of agglomeration spillovers: we assumed they are positive (ignoring the congestion effects of density), that they only influence productivity (without affecting residential amenities), and that they are uniform across sectors and confined within local economies, without spillover effects on neighboring regions. Second, we assumed a homogeneous workforce, whereas introducing labor heterogeneity allows for more complex interactions among workers and introduces redistributive motives for policy.

We now extend our analysis to include more general spillovers and worker heterogeneity, discussing circumstances under which they can lead to optimal place-based policies that favor low-income regions.

3.1 Amenity Spillovers

The appeal of a location often results from externalities that go beyond agglomeration spillovers on labor efficiency. It has long been hypothesized that quality of life, or amenities, depend on the

[9] Specifically, the subsidy is a fixed proportion of income in all locations, but the lump-sum tax t is the same regardless of location. As a result, the tax t represents a smaller share of income in high-wage locations.

size or demographic composition of a location. These effects can be positive, such as access to larger variety of services, or negative, such as increased congestion and crime (Duranton and Puga, 2020). Endogenous amenities can be introduced in the framework by assuming that local population L_j enters utility directly through a term $a(L_j)$, so that workers in j derive utility $a(L_j)\,u(c_j, h_j)$. Because households do not internalize their impact on local amenities when deciding where to move, this creates a market failure. Formally, we define the corresponding spillover elasticity:[10]

$$\gamma_j^A(L_j) \equiv \frac{\partial a_j/\partial L_j}{a_j/L_j}, \tag{13}$$

with $\gamma_j^A(L_j) > 0$ or $\gamma_j^A(L_j) < 0$. Consider the *laissez-faire* allocation in a constant elasticity model (i.e. where $\gamma_j^A = \gamma^A$ for all locations j). In this case, extending our previous discussion, one can show that a reallocation of workers from j to i is desirable in theory whenever:

$$\left(\gamma^A + \gamma^L\right)(w_j - w_i) > 0. \tag{14}$$

Moreover, an optimal allocation is characterized by the following optimal hiring subsidies:

$$s_j^{L*} = \frac{\gamma^L + \gamma^A}{\gamma^L + 1} w_j^*. \tag{15}$$

Interestingly, wages are the basis to compute the dollar value of amenity spillovers, like in the case of productive spillovers.[11] Optimal policies redistribute from high-wage to low-wage places whenever $\gamma^A + \gamma^L < 0$. That is, amenity spillovers must be negative, corresponding to *congestion* externalities; and congestion must be strong enough to dominate positive economies of density. In that case, the rationale to redistribute to low-wage cities is that it helps alleviate congestion. Absent corrective policies, high-wage cities are too crowded because the congestion cost imposed by a marginal worker there is higher (proportional to the local wage) than in a low-wage location.

Once augmented with amenities spillovers, the standard urban model with agglomeration effects on productivity provides a framework for assessing whether larger or smaller cities should grow to enhance overall efficiency in the absence of policies. The analysis has shown that high-*wage* cities can be either too small or too large, depending on whether the combined spillover elasticities $\gamma^L + \gamma^A$ are positive or negative, respectively.

What does this imply for the classic question in urban economics of whether large cities are too small or too large? Since large cities can have either high- or low- wages in a decentralized allocation, the conclusion depends on the parameters. When spillover elasticities are overall positive ($\gamma^L + \gamma^A > 0$), large cities are too small if they pay higher wages. Conversely, when spillover elasticities are negative ($\gamma^L + \gamma^A < 0$), large cities are too small if they pay lower wages.

The table below summarizes the conditions (in terms of spillover and production elasticities) under which large cities are too large in a market allocation without policy intervention. The first

[10]Because area is fixed, introducing population directly in utility also stands in for introducing density in utility. Our discussion does not rely on the multiplicative form assumed here. The same results go through if one assumes a general utility function $u(c_j, h_j, L_j)$, by properly redefining the spillover elastic γ_j^A (see Fajgelbaum and Gaubert, 2025).

[11]The reason is that the dollar value of amenity spillovers is proportional to expenditures, and expenditures move one for one with wages.

row corresponds to parameter values for which low-wage locations are too small, while the second row corresponds to cases where high-wage locations are too small. The first column corresponds to parameter values where large cities pay lower wages, while the second column represents cases where large cities pay higher wages. Whether large cities pay lower or higher wages depends in particular on the extent of decreasing returns to labor, measured by the elasticity of city output with respect to employment conditioning on the level of TFP, $\varepsilon_{F,L} \equiv \frac{\partial F_j/\partial L_j}{F_j/L_j}$.

Table 1: Are Large Cities Too Large or Too Small in the *Laissez-Faire* Allocation?

	$\left(1+\gamma^L\right)\varepsilon_{F,L} < 1$	$\left(1+\gamma^A\right)\varepsilon_{F,L} > 1$
$\gamma^A + \gamma^L < 0$	Too small (and low wage)	Too large (and high wage)
$\gamma^A + \gamma^L > 0$	Too large (and low wage)	Too small (and high wage)

Note: Each entry of the table states whether, in a pairwise comparison or two cities in a free-market allocation, the larger city is too small (hence it should grow at the expense of the smaller city for aggregate welfare to increase) or too large. The table also notes whether the lager city is lower- or higher-wage in the observed allocation given the region of the parameter space. $\varepsilon_{F,L}$ denotes the elasticity of output to total efficiency units, zL.

3.2 Heterogeneous Skills

As we have mentioned, the logic outlined so far extends to more complex setups in the quantitative spatial economics tradition (Redding and Rossi-Hansberg, 2017). Such models can be calibrated to match detailed data. As shown in Fajgelbaum and Gaubert (2025), optimal spatial policies can be solved numerically using these frameworks. Two recent papers offer insights into these methodologies, caveats, and findings in contexts that focus on skill heterogeneity with more complex spillovers across types. Fajgelbaum and Gaubert (2020) explore optimal spatial sorting of U.S. workers by education level (with and without college degree). Rossi-Hansberg et al. (2019) examine optimal sorting by occupation: Cognitive Non-Routine (CNR) versus non-CNR jobs. For simplicity, we refer to these groups as high- and low-skill workers, though their definitions are somewhat different in these two papers. In these models, workers of different skill groups differ in how they value locations and in their productivity. Each group generates productivity spillovers for its own members and potentially for other groups. Workers also generate amenity spillovers that vary across groups.

Rossi-Hansberg et al. (2019) estimate productivity spillovers by regressing worker productivity (revealed through a model calibration) on city composition, using an instrumental variables (IV) strategy.[12] They find that high-skill workers benefit from positive spillovers within their group but face negative spillovers from other groups (crowding out). Low-skill workers exhibit similar but less pronounced patterns. On the preference side, Rossi-Hansberg et al. (2019) do not account for

[12]Following Ciccone and Hall (1996), they instrument for current population using historical population, and use Card (2001) and Moretti (2004) to instrument for skill composition via historical immigrant populations and land-grant colleges.

amenity spillovers, instead relying on idiosyncratic worker preferences for location as a congestion force.

They find that the optimal allocation involves more concentration of high-skill in large cities than observed. However, those cities shrink due to congestion effects. In the optimal allocation, increased sorting is driven by positive within-group and negative cross-group spillovers, promoting greater within-group clustering and discouraging cross-group co-agglomeration.

Fajgelbaum and Gaubert (2020) use spillover elasticities from existing literature, such as wage and amenity responses to city composition from Diamond (2016) and city-level agglomeration spillover from Ciccone and Hall (1996). Given those estimates, both skill groups generate positive but small productivity spillovers. The larger amenity spillovers play a more important role: high-skill workers create positive amenities for both groups, while low-skill workers generate negative amenity spillovers, a key difference with Rossi-Hansberg et al. (2019). Fajgelbaum and Gaubert (2020) also take into account existing spatial transfers in their parametrization. To estimate these transfers, they use welfare transfers data from the Census and tax data from the BEA, adjusting for socio-demographic factors.

Three main insights emerge from these quantitative results. First, in the optimal allocation, large cities tend to shrink due to congestion effects. Second, optimal spatial sorting is less pronounced than in the current distribution. Since high-skill workers generate positive spillovers for low-skill workers, the optimal policy incentivizes them to move to locations where they are relatively scarce compared to low-skill workers. These cities tend to be smaller cities in the observed equilibrium, becoming more skill-intensive in the optimal allocation. Finally, in a few high-wage cities, the quantitative exercises reveal that a countervailing effect dominates, reversing the general tendency towards less sorting. Specifically, the presence of strong within-group spillovers among high-skill workers makes their clustering optimal in some particularly productive locations. In these cities, sorting is reinforced compared to the initial equilibrium, but total population shrinks.

This area of quantitative research is ripe for further exploration. Estimating spillover elasticities—particularly across different worker groups—remains a major challenge. The measurement of existing transfers could benefit from more precise approaches. A deeper analysis of local and federal government budgets could also more accurately trace existing spatial transfers. Systematically collecting micro-data on interregional transfers managed by different agencies will help provide a more granular view of fiscal redistribution (see Hanson and Rodrik in this volume). Addressing these gaps would significantly improve the empirical foundations of optimal spatial policy design.

3.3 Place-based Redistribution

Placed-based policies may be motivated by purely redistributive reasons. In this case, the efficiency loss entailed by redistribution and labor reallocation to low-wage places is accepted as the cost of addressing inequality concerns. The logic parallels that of income taxation: while it introduces efficiency costs by discouraging work, it serves to reduce inequality through redistribution. Naturally, place-based redistribution is inherently justified if the government cares about the level of income of a place *per se*.[13] It is not obvious, however, whether it is justified based on inequality concerns across individuals, independent of where they live. For place-based redistribution to be warranted on these grounds, it must address gaps that income taxes and other means-tested transfers alone cannot address. Atkinson and Stiglitz (1976) provide conditions under which other forms of taxation are unnecessary if an income tax system is available for redistribution.

Gaubert et al. (2024) examine whether, to tackle inequality concerns, spatially targeted subsidies towards distressed areas can improve upon purely income-based redistribution. To tackle this question, we exclude spillovers from the model but imagine there are different household types θ with varying income-earning abilities. Individuals in different groups may make different location choices, leading to spatial sorting.[14] In region j, $L_j(\theta)$ residents belong to group θ, earn wages $w_j(\theta)$, and pay taxes according to an income tax schedule $t()$ that is independent of location.

The key question is: what is the impact on social welfare—defined as the sum of individual utilities with group-specific weights—of implementing a small, budget-neutral subsidy in a distressed region? We consider a simple place-based redistribution scheme where residents of a very low-income (or "distressed") region j receive a per-capita subsidy funded by a per-capita tax levied on residents of other regions i. The distressed region may be low income due to low productivity or the sorting of low income workers. The welfare impact of such a subsidy depends on both its redistributive benefits and the associated fiscal costs. To a first order approximation, the social welfare gain from place-based redistribution is:

$$\text{Welfare Gain of Place-Based Redistribution} = \bar{\lambda}_j - \bar{\lambda}_i + \sum_{\theta} \left[t\left(w_j\left(\theta\right)\right) - t\left(w_i\left(\theta\right)\right)\right] dL_j\left(\theta\right).$$

Here, $\bar{\lambda}_j$ measures the social welfare gain from transferring an additional dollar of income to the distressed region j. Therefore, $\bar{\lambda}_j - \bar{\lambda}_i$ summarizes the relative value of redistribution to region j compared to the rest of the country i. This value is higher the stronger is the equity motive in social welfare or, with concave utility, the lower is average income of residents in j .

The term $\sum_{\theta} \left[t\left(w_j\left(\theta\right)\right) - t\left(w_i\left(\theta\right)\right)\right] dL_j\left(\theta\right)$ captures the fiscal cost from redistribution. When people move to j to earn the subsidy, their income tax contributions typically decrease (as wages in j are lower), creating a fiscal externality that offsets the benefit of redistribution. As long as this fiscal cost of migration is not prohibitive compared to the social value of redistribution, place-based subsidies remain desirable. This summarizes the fundamental equity-efficiency trade-off of taxation in the case of place-based redistribution.

[13] A striking example comes from Argentina in the 2010s, when an enterprise zone program incentivized foreign multinationals to establish factories in Ushuaia, the southernmost city in the world and the closest populated point to Antarctica.

[14] We assume here that individuals supply different amounts of efficiency units, but their efficiency units are perfect substitutes. As a result, there are no efficiency costs in production from place-based redistribution, and all the costs are summarized by fiscal externalities. Including standard production functions with complementarities between skills would imply further efficiency costs.

When Is Place-Based Redistribution Desirable? Whether this form of redistribution can increase social welfare depends on various factors. First, it depends on why distressed regions have lower-earnings. If high- and low-skilled individuals vary in preferences for location, so that the rich prefer living in i, then place is a useful tag for redistribution. Second, it depends on the mobility of workers, and specifically on whether the subsidy leads to large reallocations, the and pre-tax earnings of movers drop when they move to the laggard region. Suppose for example that the high skill sort into i because high-skilled jobs are only available there while low-skilled jobs are more evenly distributed with a common wage. In this case, only low-skill workers move from i to j without a loss of earnings. In this scenario, there is no efficiency cost of place-based redistribution.

However, certain conditions can undermine the case for place-based redistribution. First, in many cases such as in the last example, place-based redistribution may increase segregation by skills. This could be costly on efficiency grounds due to forces we have assumed away in this discussion, such as standard complementarities in production or positive spillovers from high-skill workers. Second, if the cost of living in region i is much higher than in region j, for instance, redistribution toward i could be more equitable. Third, if high-skilled individuals have jobs in both locations but are significantly more productive in region i, incentivizing them to remain there becomes economically rational, as the cost of their moving to the low productivity location could outweigh the equity benefits of place-based-redistribution. Therefore, if spatial income disparities are primarily a result of productivity differences between regions, the benefits of place-based redistribution are less certain.

Place-Based Redistribution and Restricted Mobility The canonical model we have considered in section 2 assumes that individuals are fully mobile. Following a positive economic shock to a given region, individuals move there until the price of factors (local wage and housing costs) adjusts to restore an equal utility level in all regions. In reality, mobility is restricted. In static economic models, this restricted mobility is modeled by assuming that not all individuals respond similarly to economic shocks in a region due to their unique personal characteristics. This heterogeneity is modeled through idiosyncratic preference (or cost) shocks that reflect each individual's attachment to a particular location. These personal shocks explain why some people remain in place despite apparent economic incentives to move, effectively mimicking the limited mobility that is often measured empirically (even after rather large economic shocks).

Given these individual differences, what happens to optimal place-based transfers? The efficiency motives behind place-based policies remain unchanged, and identical to the one studied in section 2. That is, place-based policy motivated on efficiency grounds depends solely on the presence of agglomeration externalities, regardless of the extent of restricted mobility due to individual shocks. However, these individual shocks for location create an additional redistributive motive for place-based transfers because governments cannot observe these shocks or lack tools to target individuals based on these shocks. A government focused on limiting inequality may now be incentivized to tax individuals whose personal characteristics are such that they chose to reside in (and are attached to) high-productivity areas, where real consumption is high and the marginal utility of a dollar is low, and redistribute to individuals who based on their preference shocks are attached to low-wage areas, where the marginal utility of a dollar is higher.[15]

4 Results from Theory

The theory we presented here is quite general, encompassing the models that are typically used in policy discussions on place-based policies motivated by agglomeration externalities or under-investment in infrastructure. The model is agnostic regarding the specific microfoundation of spillovers, which could arise, for instance, from Marshallian externalities or the benefits of access to thick input markets, among other sources (Duranton and Puga, 2004). Spillovers may also be negative, for example due to efficiency loss from increased commuting times, as in systems-of-cities models. Different microfoundations manifest in distinct functional forms for the spillover functions $\gamma_j^L(L_j)$ and $\gamma_j^I(I_j)$. The optimal policy formulas indicate that what matters is the elasticity of these functions, multiplied by wages (for hiring subsidies) or infrastructure costs (for infrastructure subsidies).

Through the lens of this general model, we obtain six takeaways that revisit in part some conclusions from the previous literature.

Result 1: The decentralized spatial allocation is generically inefficient, even when spillover elasticities are the same everywhere. An hypothesis that has been discussed in the place-based policy literature is that the spatial allocation is efficient when the agglomeration elasticity is constant across space, $\gamma_j^L = \gamma^L$. This view is expressed in influential contributions. For instance, Kline and Moretti (2014a) note that "*although agglomeration economies generate market failures at the local level, these inefficiencies may "cancel out" in the aggregate if agglomeration elasticities are constant.*" The intuition for this prior is summarized by Duranton and Venables (2018): *"When cluster expansion occurs because of labour relocation from other areas, agglomeration gains in the targeted area will come at the expense of agglomeration losses elsewhere. In the specific case where the agglomeration elasticity is constant, the gains in the targeted area will be exactly offset by the losses elsewhere"*. Glaeser and Gottlieb (2008) as well as literature reviews by Kline and Moretti (2014b) and Neumark et al. (2015) also reflect this perspective.

Our analysis shows that the market allocation is inefficient even in the benchmark case where spillover elasticities are constant. The reason is that the critical factor for policy is the dollar value of the spillover, $\Gamma_j^L = w_j\gamma^L$, which varies across locations due to differences in wages, rather than just the elasticity γ^L itself. Hence, spatial differences in γ_j^L, perhaps due to nonlinearities

[15] Formally, if these idiosyncratic preferences follow either a Fréchet distribution that multiplies consumption or a logit shock that is additive with log-utility of consumption, two modeling choices that have been very popular in the literature, the resulting optimal transfer resembles that of an efficiency-driven transfer in a model with negative amenity spillovers (i.e., congestion effects). However, the interpretation here is distinct: the transfer serves purely redistributive purposes, designed to balance welfare among heterogeneous individuals based on the varied economic contexts of their chosen locations.

as a function of population size, are not necessary to justify policy intervention (though such heterogeneity would, of course, influence optimal policies if present).

The previous hypothesis in the literature resulted from assuming away spatial transfers. Transfers create imbalances between the production and consumption of tradables, and these transfers are essential for incentivizing spatial reallocations when there is free labor mobility. However, Glaeser and Gottlieb (2008) and Kline and Moretti (2014a) study welfare impacts of labor reallocations while assuming zero transfers. This approach has three potential issues. First, without transfers, only one allocation –the market allocation– is consistent with free labor mobility. Any alternative allocation would involve differences in utility across space, conflicting with the concept of free mobility. Any other zero-transfer allocation requires forced migration. Second, transfers enable Pareto improvements whether labor mobility is free or constrained by forced migrations. Thus, if transfers are allowed, the zero-transfers market allocation is inefficient. Third, the place-based policies we consider –wage subsidies implemented by a federal government– involve payment imbalances across regions, with some regions as net contributors and others as net beneficiaries. Therefore, transfers are necessary to think about these policies. In sum, our conclusions differ from previous research because our analysis accounts for transfers and for their effects on welfare and mobility.[16]

Result 2: In the model, a national space-invariant wage subsidy coupled with a lump sum tax is optimal when the spillover elasticity is common across space. With constant elasticity spillovers, the optimal dollar subsidy per worker predicted by the model, $\frac{\gamma^L}{1+\gamma^L} w_j^* - t^*$, varies across space. However, the policy implementing this transfer per capita is spatially invariant: the optimal policy consists of a wage subsidy paid to firms equal to a constant fraction $\frac{\gamma^L}{1+\gamma^L}$ of the local wage, an input subsidy equal to a constant fraction $\frac{\gamma^I}{1+\gamma^I}$ of infrastructure cost, and a uniform lump-sum tax t^* applied to all workers. This result is somewhat counterintuitive in the case of labor: although labor supply is fixed at the national level, subsidizing labor everywhere enhances welfare. One might expect a spatially uniform subsidy to only have aggregate effects if it increases overall factor usage. However, when combined with a lump-sum tax, a flat subsidy rate can distort the allocation in a welfare-enhancing way by making the per-capita transfer vary spatially.[17] A policy implication is that targeting specific regions is not necessary to achieve the optimal spatial allocation. A nationally *untargeted* wage subsidy s^*, paired with the lump-sum tax t^*, allows the allocation to adjust efficiently. In particular, a positive and constant agglomeration elasticity justifies a national wage subsidy.

[16]In cases with fixed factors in production or consumption such as land, the optimal allocation can also be implemented by taxing local fixed factors in j to finance the subsidies paid to firms in j, a generalization of the Henry-George Theorem (Fajgelbaum and Gaubert, 2025). Such a policy also materializes as a particular distribution of spatial imbalances. Therefore, regardless of the revenue source for the subsidies, either via taxing local factors as in the Henry-George Theorem (if feasible) or via a lump-sum tax on workers as we have assumed, the optimal allocation features (the same) payment imbalances. We note our proposed implementation is feasible even in cases where taxing local factors to finance local subsidies is not, or even without fixed local factors.

[17]We also note that the subsidy s_j^{L*} is a gross payment worker to a location. The net transfer per worker to a location is $s_j^{L*} - t^*$ where t^* is a lump-sum tax.

Result 3: Beyond the constant-elasticity case, the optimal subsidy rate to a region equals its spillover elasticity. Austin et al. (2018) write that *"unless we understand the spatial heterogeneity of agglomeration effects, the existence of agglomeration does not justify spatially heterogeneous polices"* (p.19). Our results support this view. Spatially heterogeneous policies, defined as heterogeneous wage or infrastructure subsidy *rates* in space, are justified only if the agglomeration elasticities γ_j^L and γ_j^I vary in space. In practice, only a few studies quantify optimal spatial policies with heterogeneous elasticities (Fajgelbaum and Gaubert, 2020; Rossi-Hansberg et al., 2019; Au and Henderson, 2006). The general finding from these studies is that heterogeneity in elasticities tends to magnify potential gains from optimal spatial policies. However, a lot of uncertainty remains about the values of these heterogeneous spillovers.

Result 4: Place-based policies that favor low-wage locations on efficiency grounds are justified in the model under at least one of the following conditions: (i) negative effects from density; (ii) higher spillover elasticities in low-wage locations; or (iii) across-skill spillovers that favor more mixing in low-wage locations. The analysis demonstrates that optimal subsidies to richer, high-wage regions can be easily theoretically justified by the presence of positive and constant agglomeration spillovers. This result is robust to many model extensions. The rationale for redistributing to poorer, laggard regions to improve efficiency requires more assumptions. Such redistribution, to be justified on efficiency grounds, requires heterogeneity in spatial externalities, such as higher spillover elasticities in poorer regions (as suggested by Austin et al., 2018), sufficiently negative congestion spillovers from density that impact productivity or amenities, or significant heterogeneity in spillovers across skill groups to justify more mixing of high and low skill workers in low-wage locations. Additionally, redistributing to low-wage regions can be justified on purely redistributive grounds to address equity concerns.

Result 5: Government spending on infrastructure, investment incentives, or housing policies cannot optimally deal with agglomeration spillovers generated by labor density. The optimal policy prescriptions are strongly disciplined by the principle of targeting: the optimal policy targets the distorted margin only (Bhagwati and Johnson, 1960; Dixit, 1985). This principle holds regardless of general-equilibrium ramifications. Externalities generated by labor are optimally addressed through direct subsidies to labor. Subsidizing investment or housing to attract workers to a given location would distort those markets, potentially expanding employment in a welfare-enhancing way, but such policies are neither necessary nor sufficient to achieve an optimal allocation. The same logic applies to government spending on infrastructure, which in our framework corresponds to a local subsidy to finance infrastructure I_j. This policy is suboptimal for addressing externalities created by labor.

The fact that alternative policies alone are insufficient to achieve the efficient allocation does not mean they cannot improve welfare at all if the ideal instrument is restricted. For instance, starting from a market allocation without wage subsidies, labor agglomeration spillovers could be partially addressed through infrastructure investment or housing subsidies. To ask this question here, we can start from an initial equilibrium with no subsidies (neither for infrastructure nor labor), and introduce a change in investment subsidies that leads to a reallocation dI_j. These reallocations, in turn, induce changes in labor dL_j. As a result, from (2), the welfare gains are:

$$\text{Welfare Gain from Reallocations} = \sum_j \gamma_j^L w_j dL_j + \sum_j \gamma_j^I p_j dI_j. \tag{16}$$

The first term in this expression is the indirect effect of changes in infrastructure on labor reallocations and the second term is the direct effect. The indirect effect can be welfare-enhancing if it reallocates labor in the right direction (i.e., from locations with high $\gamma_j^L w_j$ to those with low $\gamma_j^L w_j$). Since employment tends to increase in locations receiving infrastructure, it follows that, around a market allocation without hiring subsidies, second-best investments in infrastructure could in principle improve welfare if they favor high-wage or high-spillover elasticity locations. However, Kline and Moretti (2014a) show that, in a special case of the model,[18] infrastructure investments have no second-best role in correcting distortions from labor spillovers: the first term of (2) vanishes, meaning that labor agglomeration spillovers (γ^L) do not influence the welfare effects of infrastructure changes (still, in their environment, a first-best solution can be achieved through labor subsidies alone). Their result suggests the scope for second-best interventions may be limited.

Result 6: Housing supply elasticities do not matter to design first-best place-based policies. The optimal rates for wage and infrastructure subsidy are *only* a function of the spillover elasticities. While we presented this result in a somewhat restricted model (for example, with a constant supply of housing), Fajgelbaum and Gaubert, 2025 demonstrate that all the results we have discussed hold in a more general model with a flexible production structure. The framework can include features such as trade costs, many goods, a general input-output structure and a flexible housing supply. Therefore, the demand and supply elasticities of different sectors of the economy do not affect the design of optimal policies targeting spatial spillovers. However, an important caveat is that this result assumes that these sectors, including the housing sector, are not distorted beyond the agglomeration and congestion effects we model.

One might initially believe that housing supply elasticities are relevant for determining optimal policies because they affect how local house prices adjust in response to increased labor agglomeration. However, this is not the case. The theoretical optimal policy is a wage subsidy rate determined only by the agglomeration spillover elasticity. Housing supply elasticity does affect the incidence of the policy—that is, which factors benefit most from the policy. For this reason (though not for efficiency reasons), it could prompt additional government interventions aimed at redistributing the gains between different stakeholders in the economy (e.g., labor and landowners, treated here as one group).

In summary, while housing congestion and supply elasticity impact the welfare gains and the incidence of the optimal policy, they do not affect the specific structure of an efficient policy.

[18] They assume no fixed factors in the economy (or a fixed factor that is owned by absentee landowner and not counted towards welfare), constant-elasticity spillovers $\gamma_j^L = \gamma^L$, and exogenous costless shifts dI_j (not financed by reallocations away from other locations or from consumption).

5 Generalizations and Caveats

The model we used to derive the previous results nests canonical spatial frameworks. As we have mentioned, the results hold under alternative land ownership assumptions, including absentee landowners. As shown byFajgelbaum and Gaubert, 2025, the results also hold under more general production structures, where the economy produces many products, production takes place in several sectors connected by input-output linkages, and trade is frictional. The key restrictions we have imposed are that amenity and productivity spillovers are local (population in location j only affects productivity or amenities in j) and productivity spillovers are sector-neutral (corresponding to urbanization externalities that are economy-wide, rather than localization externalities that percolate sector-by-sector).

However, two important caveats to these results are in order. First, our discussion assumed no pre-existing distortions other than spillovers. In the presence of other distortions –such as local wedges, housing regulations, administrative costs to implement the policy, or local land ownership– if spatial taxes remain the only instrument then the optimal policies will incorporate an incentive to offset those distortions.

Second, the nature of labor demand and supply interactions leading to inefficiencies also matters. Bilal (2023) shows that first-best policies affecting both labor demand and labor supply are needed in a context, different from ours, with labor market frictions where inefficiencies in the spatial allocation arise from aggregate matching externalities between workers and firms.

6 Conclusion

We summarized the takeaways from a standard spatial theory of place-based policies and show that there is generally a case for place-based policies to increase efficiency whenever spatial externalities are at play, whatever their shape. The analysis reveals that it is easy to justify optimal subsidies to richer regions on the basis of positive agglomeration spillovers. However, the case for redistributing to laggard regions in order to increase efficiency is more nuanced, requiring either heterogeneity of spatial externalities with higher spillover elasticities in poorer regions (as suggested by Austin et al., 2018), sufficiently negative congestion spillovers from density operating either through efficiency or amenities, or spillovers from high- to low-skilled workers with the former in scarcer supply in low-wage areas.

To make progress on policy-relevant conclusions, it is therefore important that the empirical literature brings in new evidence on the magnitude and nature of spillovers. In an influential study on place-based policies, Glaeser and Gottlieb (2008) were cautious about place-based policies conducted for efficiency reasons, as they rely on knowledge of elasticities that are very hard to estimate. Recent advances in data access and analysis are promising in that respect, as researchers have started to leverage big data that can be used to estimate granular spillover effects (Atkin et al., 2022; Couture et al., 2024). As newer estimates become available, it may be time to reassess the desirability of place-based policies empirically.

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A Derivations

A.1 Market Allocation

We define the equilibrium of a market allocation of the model used throughout this article.

First, tradable goods are produced using labor and infrastructure, with subsidies on each:

$$\Pi_j^Y = \max A_j F_j \left(\underbrace{z_j L_j}_{N_j}, I_j \right) - \left(w_j - s_j^L \right) L_j - \left(p_j - s_j^I \right) I_j$$

leading up to the first order conditions on efficiency units and infrastructure,

$$[N_j] : A_j z_j \frac{\partial F_j}{\partial N_j} = w_j - s_j^L \tag{17}$$

$$[I_j] : A_j \frac{\partial F_j}{\partial I_j} = p_j - s_j^I \tag{18}$$

Second, workers solve

$$v_j = \max u_j \left(c_j, h_j \right) \tag{19}$$

subject to the budget constraint

$$x_j = c_j + R_j h_j = w_j + \pi - t \tag{20}$$

where aggregate returns to fixed factors are:

$$\pi = \frac{\sum_j R_j H_j + \Pi_j^Y}{L}. \tag{21}$$

Third, workers are perfectly mobile so that in all populated locations:

$$v_j = \max u_j\left(c_j, h_j\right) = u. \tag{22}$$

Fourth, markets clear, specifically:

- the government budget clears,

$$tL = \sum s_j^I I_j + \sum s_j^L L_j, \tag{23}$$

- the goods market clears,

$$\sum_j c_j L_j + \sum_j p_j I_j = \sum_j A_j\left(I_j\right) F_j\left(z_j\left(L_j\right) L_j, I_j\right), \tag{24}$$

- the national labor market clears,

$$\sum_j L_j = L, \tag{25}$$

- and the housing market clears,

$$h_j = \frac{H_j}{L_j}. \tag{26}$$

A.2 Perturbation of an Equilibrium

Consider a perturbation (dc_j, dL_j, dI_j) around a market allocation. Using the feasibility condition (24) and the first-order conditions (17) and (18) yield:

$$\sum_j dc_j L_j + \sum_j c_j dL_j = \sum_j \left[A_j'\left(I_j\right) F_j - s_j^I\right] dI_j + \left(w_j - s_j^L\right)\left(\gamma_j^L + 1\right) dL_j. \tag{27}$$

Using the spatial mobility condition (22) with equality, the consumer's problem implies that indirect utility is equalized in space across populated locations:

$$v_j\left(x_j, R_j\right) = u \tag{28}$$

Totally differentiating this condition and the individual budget constraint yields:

$$dc_j = \frac{x_j}{\varepsilon_{v_j,x_j}} \frac{du_j}{u_j} + \left(x_j - c_j\right) \frac{dL_j}{L_j} \tag{29}$$

where ε_{v_j,x_j} is the elasticity of v_j with respect to x_j. Combining (27) and (29) and using (25) yields:

$$\frac{du}{u}\frac{1}{\chi} = \sum_j \left(\gamma_j^L w_j - \left(\gamma_j^L + 1\right) s_j^L\right) dL_j + \sum_j \left(A_j'\left(I_j\right) F_j - s_j^I\right) dI_j. \tag{30}$$

where $\chi \equiv \left(\sum_j \frac{x_j}{\varepsilon_{v_j,x_j}} dL_j\right)^{-1}$. Further using (18),

$$\frac{du}{u}\frac{1}{\chi} = \sum_j \left(\gamma_j^L\left(w_j - s_j^L\right) - s_j^L\right) dL_j + \sum_j \left(\gamma_j^I\left(p_j - s_j^I\right) - s_j^I\right) dI_j. \tag{31}$$

A.3 Alternative Assumptions on Land Ownership

This appendix shows that the result that the decentralized equilibrium is generically inefficient is robust to different assumptions on land ownership. We refer the reader to Fajgelbaum and Gaubert (2020) and Fajgelbaum and Gaubert (2025) for detailed derivations.

A.3.1 Model Extension

The model is extended by assuming that local workers in location i now own a fraction $0 \leq \omega \leq 1$ of the local returns to land, while in the main text $\omega = 0$. We make simple functional forms assumptions for exposition, but nothing depends on these. The utility function is Cobb-Douglas, $u_j(c_j, h_j) = c_j^{1-\alpha} h_j^{\alpha}$. The budget constraint of a worker is $c_j + R_j h_j = x_j$, where x_j is total worker income in j. Given our assumption on land ownership, workers' income absent government transfers is:

$$x_j = w_j + \omega \pi_j + (1 - \omega)\pi.$$

Production of the traded good is $Y_j = A_j z_j L_j$, where L_j is local employment and z_j captures agglomeration effects: $z_j = L_j^{\gamma_j^L}$. The housing stock is exogenous in each location, H_j, so that $h_j = H_j/L_j$.

A.3.2 Planner's Problem and First Best Solution

A planner's maximizing worker's welfare chooses allocation of consumption and labor across space that solves the following problem:

$$\max_{L_j, c_j} u$$

such that:

$$c_j^{1-\alpha}\left(\frac{H_j}{L_j}\right)^{\alpha} = u \text{ if } L_j > 0 \text{ (and } \leq u \text{ otherwise)} \tag{32}$$

$$\sum_j c_j L_j = \sum_j A_j L_j^{1+\gamma_j^L} \tag{33}$$

$$\sum_i L_j = L \tag{34}$$

where we have plugged in the constraint $h_j = H_j/L_j$ into utility. The Lagrangian of this problem is:

$$\mathcal{L} = u - \sum_j \omega_j c_j^{1-\alpha}\left(\frac{H_j}{L_j}\right)^{\alpha} - P^*\left[\sum_j c_j L_j - \sum_j A_j L_j^{1+\gamma_j^L}\right] - \Omega\left[\sum_j L_j - L\right] \tag{35}$$

As detailed in Fajgelbaum and Gaubert (2025), this planner's problem yields the following expression for optimal worker income in j:

$$x_j = w_j\left(1 + \gamma_j^L\right) - \Omega \tag{36}$$

The optimal allocation is such that the unearned income $x_j - w_j$ of a worker is a constant $(-\Omega\ )$

plus a subsidy $\gamma_j^L w_j$, proportional to the local wage and to the spillover elasticity. Note that the planner chooses consumption c_j in each location j with the only constraint that total consumption equals total production of the traded good in the economy, i.e. condition (33). However, it is not the case that consumption in location j is equal to production in location j; generically, we have $c_j L_j \neq A_j L_j^{1+\gamma_j^L}$. The difference between production and consumption of the traded good in a given location is made possible by government transfers. This is a key difference with analyses of efficiency in spatial models, such as Glaeser (2008) and Kline and Moretti (2014a), that assume away such transfers by writing $c_j L_j = A_j L_j^{1+\gamma_j^L}$ or by assuming that the utility of a worker is $\left(A_j L_j^{\gamma_j^L}\right)^{1-\alpha}\left(\frac{H_j}{L_j}\right)^{\alpha}$. The latter is only the case in the absence of transfers, i.e. when the planner does not intervene.

A.3.3 Under what assumption on ownership of land is the decentralized allocation efficient?

Workers' income is: $x_j = w_j + \omega \pi_j + (1-\omega)\pi$, where local rents per capita are $\pi_j = \frac{R_j H_j}{L_j}$ and $\pi = \frac{\sum_j R_j H_j}{L}$ is the total returns to land in the economy. Given demand for housing, workers income can be solved further. In the decentralized equilibrium, it is:

$$x_j = \frac{1}{1-\omega\alpha} w_j + \frac{1-\omega}{1-\omega\alpha}\pi$$

The market allocation is efficient if this income aligns with (36), meaning that

$$\frac{1}{1-\omega\alpha} w_j = \left(1+\gamma_j^L\right) w_j.$$

The market allocation is therefore inefficient whenever $\omega = 0$ (the assumption in the main text), but it is also inefficient if $\omega = 1$ (local ownership of land, a popular assumption in the literature), or in fact for generically any ownership scheme except for the knife-edge case where it so happens that the local ownership share of land is $\omega = \frac{1}{\alpha}\frac{\gamma_j^L}{1+\gamma_j^L}$.

A.3.4 With Absentee Landowners

Another variant of the model assumes that land is owned not by mobile workers, but by absentee landowners. The absentee landowners own all the returns to land, do not work, and, to properly close the model, they spend their income on tradeable goods C_L with utility function $g(.)$. In this case, with two types of agents, the planner's Pareto frontier between workers and landowners is found by maximizing utility u of workers given each possible level of landowner utility $\underline{u}_L$, or equivalently for any consumption level of landowners $\underline{C}_L \equiv g^{-1}(\underline{u}_L)$. The Lagrangian of this problem is thus:

$$\mathcal{L} = u - \sum_j \omega_j c_j^{1-\alpha}\left(\frac{H_j}{L_j}\right)^{\alpha} - P^*\left[\sum_j c_j L_j - \left(\sum_j A_j L_j^{1+\gamma_j^L} - \underline{C}_L\right)\right] - \Omega\left[\sum_j L_j - L\right]. \quad (37)$$

This problem is the same as (35), except for the constant $\underline{C}_L$ subtracted from consumption available to workers. Therefore, the expression for optimal worker's income still adopts the form (36), implying that zero transfers across space are, again, inefficient, regardless of the planner's distributional preferences between workers and landowners (i.e., regardless of $\underline{C}_L$).