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By

Edward L. Glaeser

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Harvard University  
Cambridge, Massachusetts

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# THE ECONOMICS OF LOCATION-BASED TAX INCENTIVES

by

Edward L. Glaeser<sup>1</sup>

*Harvard University and NBER*

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## ABSTRACT

Many local governments offer rich tax deals to firms to get these firms to come to their cities. In this brief essay, I review the economics of location-based tax incentives. I first address the positive economics of these incentives and present five theories of why these tax incentives occur. I then consider the normative aspects of these incentives and discuss the conditions under which these theories lead to optimal locations of firms and to optimal bundles of public goods. In general, I argue that tax incentives will generally lead to more efficient locational decisions. There may be undesirable redistributive consequences of these incentives, but these are best handled by national redistribution policy.

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<sup>1</sup> This essay was written for the Brookings-Wharton Papers on Urban Affairs. In particular, this is a discussion of Therese McGuire and Theresa Garcia-Mila's "Tax Incentives and the City."

## I. Introduction

Why did Chicago offer Boeing \$50 million in tax abatements to locate in that city? Are tax deals like this welfare-enhancing or socially damaging? This short paper presents a brief verbal analysis of the tax incentives that locations often offer individual firms. These tax incentives are large firm-specific tax abatements which often play a significant role in attracting firms to locations. In this brief note, I review the prevailing theories about why tax incentives occur, and whether they should occur.

This note was written as a response to Garcia-Mila and McGuire's "Tax Incentives in the City" and it should be seen as a review rather than new research.<sup>2</sup> However, given the importance of the topic, I thought it useful to circulate this review piece as a working paper. Naturally, this should be seen as a conceptual review piece, not as new research.

What are tax incentives conceptually? There are two rival definitions of tax incentives. First, tax incentives can be seen as tax rates that are chosen on a firm-by-firm basis. As such, the interesting thing about tax incentives is their heterogeneity among firms. Needless to say, they also represent a great increase in the discretionary nature of taxation. Second, the tax breaks may also represent a reduction in the total tax rate. Indeed, Garcia-Mila and McGuire define tax incentives as "a tax rate lower than the marginal benefit of the public goods and services provided to the firm." McGuire and Garcia-Mila's model focuses on the level of taxes in a single jurisdiction. It provides both a justification for why tax incentives should be below the cost of public goods and services and a possible framework for understanding inter-firm heterogeneity in tax rates.

When a company like Boeing—the topic of McGuire and Garcia-Mila's case study—receives a \$50 million dollar tax package, this is both an increase in the degree of heterogeneity of tax rates and a decrease in the mean level of taxes. However, I think that the most striking thing about the Boeing example is its firm specific nature, and it is

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<sup>2</sup> As this note was written as a response to another paper which has extensive references, I have avoided writing extensive references here.

this aspect of tax incentives that I will focus on in this piece. Moreover, it is hard to know whether Boeing is actually covering the costs of public services it consumes. I am not sure if tax incentives ever exist using Garcia-Mila and McGuire's definition. As such, I think the heterogeneity of tax rates, and the fact that these tax rates are handled on a firm-by-firm basis, is much more important than the effect of these tax incentives on the overall tax rate. The rest of this note will focus on two linked but fundamentally different questions: why do tax incentives occur (the positive question) and what are the welfare effects of tax incentives (the normative question).

## **II. Why do cities offer tax incentives?**

In this section, I review five theories about why tax incentives occur. Some of these theories (such as the agglomeration view) suggest a benign side of tax incentives, and other theories (such as Influence and Corruption) suggest that tax incentives are pernicious. However, almost all of these theories are fundamentally positive and leave the normative question—should tax incentives be banned—unanswered. The first two theories start with the view that governments maximize the consumer welfare of their current residents. Theories three and four are based on the assumption that local governments maximize total tax revenues. Theory five assumes that corrupt officials maximize their own well-being and pay little attention to the needs or demands of their community.

### *Positive Theory # 1: Consumer and Producer Surplus*

The simplest theory of tax incentives is that these represent bids by communities to attract firms that will generate either consumer or producer surplus for the current residents of the community. According to this theory, when the firm moves in, it will be involved in local markets for inputs (mainly labor) and perhaps also local markets for outputs. In both of these cases, conventional welfare analysis suggests that there will be welfare triangles that are gained by the city. Even if the firm acts as a local monopolist or monopsonist, there will be inframarginal workers or consumers who strictly benefit

from the firm's presence. Upward sloping labor demand curves mean that some workers will be strictly better off by the presence of the firm. Downward sloping consumer demand curves mean that some customers are made better off by the new producer.

According to this theory, when cities bid for firms their bids reflect the different levels of welfare gain that they expect their residents to get from the presence of the firm. As such, this bidding presence is essentially benign (since after all, Pareto optimality requires that the firm takes this surplus into account when making its location decision). This force seems to matter mostly for firms that are hiring large numbers of workers, or firms that are supplying to the local market. One positive explanation for the subsidization of local sports teams is that these teams generate consumer surplus which they are not directly able to capture.

What are the implications of this theory? In general, the size of the subsidy that the government will pay should be equal to the level of consumer/producer surplus that will be generated. This implies that when labor supply is elastic (i.e. workers and jobs are homogeneous), there will be little local surplus. When labor supply to this firm is more inelastic, then workers will get rents from this new source of labor demand and the city should be willing to offer tax incentives to the firm. Obviously, if (as in the case of Boeing) there will be few local employees from the move, then this theory predicts that Chicago should not be willing to pay for the firm's location.

The same simple price theoretic arguments apply when thinking about consumer predicts. If demand is highly elastic, and the price is close to willingness-to-pay for all of the consumers, then this product generates little consumer surplus. However, more inelastic demand yields higher surpluses. Naturally, cities with bigger local demand for the firms product will generally be willing to offer most in terms of tax incentives. A further important factor in this case is returns-to-scale technology on the part of the firm. If the product has large fixed costs and the firm prices at close to marginal cost, then the consumers will get almost all of the surplus. This may be the case for some sports teams

which have large fixed costs and in either the cases of stadiums or television coverage, marginal costs are small. Of course, Boeing does not supply any local products.

A final implication of this theory is that the level of tax incentives may be higher than the net present value of the taxes (minus cost of public services) that the firm will pay to the city. As the tax incentive is meant to pay for the surplus that the firm will bring to the city, then this tax incentive should represent a net transfer to the firm.

### *Positive Theory # 2: Agglomeration Economies*

This theory represents the contribution of Garcia-Mila and McGuire to the literature. Their work argues that if there are agglomeration economies, then cities will bid to capture firms which generate these agglomeration economies. They have modeled this case in some detail so it makes little sense for me to review it here. Instead, I will stress two aspects of the model which limit its ability to generate testable implications. These comments should not be seen as a slight on their work, but rather an attempt to stress just the full extent to which this theory can be useful.

My first point is that the primary empirical implications of this model will come from the agglomeration production function. Firms that offer higher spillovers will get bigger tax incentives. Cities that stand to benefit most from these spillovers will pay most for these firms and offer higher incentives. This type of cross-city, cross-industry variation will stand to be the primary testable implication of this model. Since we aren't so sure about the factors that lead to greater spillovers, probably the most sensible modeling approach would be to put together a very flexible function that included both firm and location characteristics as determinants of the level of spillovers.

Garcia-Mila and McGuire assume that agglomeration economies are a function of "k"—the capital to labor ratio of the jurisdiction. This is certainly one plausible assumption, but the agglomeration economy literature has generally focused on skill levels rather than capital/labor ratios as the source of agglomeration economies. Rauch (1993) documents

that wages and rents both rise in skilled cities. Glaeser et al. (1995) show that skilled cities grow more quickly than unskilled cities. As such, it is at least as reasonable to assume that the magnitude of spillovers generated by a new firm is a function of the number of skilled workers that it brings to the city. This different specification of agglomeration economies would yield the prediction that tax incentives will be larger towards firms that have more skilled workers.

Another stylized fact from the urban growth literature is that cities with lots of small firms grow faster than cities with a few big firms. This work suggests that externalities are more likely to be associated with small start-ups than with large established companies. If this is true, then it becomes much harder to rationalize tax incentives for big firms as sensible responses to agglomeration economies. Indeed, if agglomeration economies are a function of the number of small firms, then Chicago's subsidy for Boeing can be best understood if the Boeing employees are likely to start their own start-ups after they leave Boeing.

A third fact from the agglomeration literature relates to the connection between cities and firms—Glaeser et al. (1992) find that growth is associated with urban diversity and interpret this as evidence for the importance of cross-industry intellectual spillovers. If this is correct, then cities would be expected to offer tax incentives for firms that greatly broaden the scope of the activities in the place. If new ideas are formed by combining old ideas, then bringing in new industries that add diversity will have particular value. This theory predicts that tax incentives will be particularly likely to be given to firms that add industrial diversity to the city.

A second sensible extension of the theory would be to consider more dynamic concerns—in particular the location of other firms. Agglomeration-based tax incentives become more and more attractive when they induce other firms to come to the city. In that case, the optimal tax incentive includes both the direct effect of the first firm plus the indirect effects that work through the location of other firms. This is one way to

understand the massive subsidies paid to railroads in the 19<sup>th</sup> century. Railroads were thought to be attractive because they would induce other firms to locate in the town.

This type of argument suggests that spillover-based tax incentives are likely to be used when there is a ready supply of other firms that are ready to follow the first mover. A particularly strong example of this might occur in a dynamic battle between two locations where the location where the first firm locates will prove to be extremely attractive to a whole wave of following firms. In that case, the two locations should be willing to pay a great deal to attract the first firm. This can be thought of as a case where the elasticity of future migration to the city with respect to the location of the firm is extremely high.

A final implication of this theory is, as Garcia-Mila and McGuire prove, that tax incentives will be sufficiently high so that tax payments net of public services costs will be negative. As such, this aspect of the theory predicts the same thing as the consumer surplus theory.

### *Positive Theory # 3: Ex-Post Appropriation*

A third theory of tax incentives is that these large up-front payments exist to compensate firms for future tax payments. According to this view, once firms move to a particular location they will be easy for the local government to exploit. The firm's fixed resources create an immobility which means that it is easy prey for a taxing authority. Forward-looking firms recognize this fact and demand up-front tax breaks to compensate for ex-post appropriation.

This type of theory also has some clear implications for the firms that will be given particularly generous tax breaks. In particular, more immobile firms will be more likely to receive up front payments than less mobile firms. Furthermore, firms which have very inelastic demand for land and local labor will be the most attractive prey for ex-post appropriation. As such, they will be most likely to receive large up-front payments.

Most generally, the firms that will end up paying the most ex post will receive the largest tax breaks ex ante.

This theory also predicts that tax incentives will never be so high that the total net present value of future tax payments minus the tax break are less than the total net present value of providing the firm with public services. As such, this is a theory that can explain the tax incentives that we see in practice, including the Boeing deal. However, this theory cannot explain tax incentives as they are defined by Garcia-Mila and McGuire.

*Positive Theory # 4: "Tax" Discrimination*

A fourth, related theory is tax discrimination. According to this theory, there are firms with different levels of demand for different locations. As such, local governments face a supply of potential resident firms. Just as monopoly providers of any goods ideally charge different prices for the product to consumers with different reservation values, this theory predicts that locations will charge different tax rates to different firms depending on how much they want to locate in the city. If the city is to extract maximum revenues (while attracting as many firms as possible), it needs to tax inframarginal firms more and marginal firms less.

This theory predicts that the recipients of tax incentives will be those firms that are on the locational margin. Thus, firms that really need to be in Chicago will receive no tax incentives. Firms like Boeing, that are on the margin, will not receive these breaks. In principle, empirical work could test this hypothesis by calculating the extent to which some firms are differentially drawn to any given location on the basis of that location's assets (including its labor force). Firms that are strongly attracted to the location should get lower tax incentives.

Like the previous theory, this theory cannot predict tax incentives as defined by Garcia-Mila and McGuire. In this case, tax incentives will never be so high that the net present value of taxes minus the cost of public services is negative. At the most extreme, tax

incentives will mean that for the firm that is on the margin, the flow of tax revenues minus public costs will equal zero.

*Positive Theory # 5: Corruption and Influence*

The fifth theory of why tax incentives occur is corruption and influence. According to this theory, these incentives don't represent maximization of tax revenue or maximization of the welfare of current residents of the city. Instead, tax incentives reflect the ability of the firm to bribe or coerce the leaders of the government. The 19<sup>th</sup> century tax incentives for railroads were often motivated by this force as railroads regularly bribed politicians to get generous tax treatment (see Glaeser, 2001, for details). In the 19<sup>th</sup> century explicit bribes were often the norm. In the 20<sup>th</sup> century, contributions to election campaigns or skillful use of the revolving door are presumably more common.

This theory predicts that the level of tax incentives is determined by the ability of the firm to get away with this bribery. Situations where detection is difficult will be more likely to lead to tax incentives. This predicts that tax incentives will be linked to the appearance of spillovers or large consumer surplus. Tax incentives will be more likely to be granted to firms that are politically influential. Furthermore, when it is difficult to monitor public officials we will expect to see higher levels of tax incentives. This theory predicts that tax incentives should be more common in countries with weaker rule of law, and that tax incentives should have been more common in the 19<sup>th</sup> century when detection was difficult.

Naturally, this theory predicts little about the overall tax level. Tax incentives may be so generous that the overall net tax revenue may even be negative. On the other hand, tax incentives may be much less depending on what the firm and politicians can get away with.

### **III. Should cities offer tax incentives?**

There are two separate normative questions related to tax incentives. First, do these incentives distort the location decisions of firms. Second, do these tax incentives lead to tax burdens that are too low and correspondingly low levels of public services. A question that is related to the second question is whether these incentives lead to an undesirable level of transfer to mobile firms.

*Normative Question # 1: Will tax incentives lead firms to make the wrong location decisions?*

From an urban economics perspective, this is perhaps the central normative question. Does the behavior of local government lead to spatial distortions where tax incentives distort the decisions of firms? Some of the positive theories of tax incentives predict that these incentives create spatial distortions. Other theories predict that tax incentives are necessary corrections to existing distortions.

What does efficient location actually mean? In principle, this means that firms choose location in such a way that maximizes total social surplus. The benefits of a firm moving to a particular location should include the profits that the firm earns from the location, any external effects, and the consumer and/or producer surplus created by the locational choice. The costs include the cost of providing public services. For the purposes of this question, I will avoid discussing so-called fiscal externalities that lead to transfers of funds from one location to another. These fiscal externalities can, of course, always be undone at the central government level and will be addressed in the subsequent section.

The way that I have framed the question makes it clear that if either agglomeration economies or these consumer surplus type issues exist, then tax incentives are almost surely necessary to get the efficient location of firms. The misallocation of firms will depend on the extent to which agglomeration effects differ across space. In principle, if firms generate agglomeration economies, but these are constant, then there is no need for

tax incentives. However, this will generally be unusual. More generally, tax incentives will lead to efficient, not inefficient, location of firms if there are heterogeneous agglomeration effects across space.

If there are no agglomeration effects and no spatial impacts of consumer or producer surplus effects, and if tax incentives address tax issues, then there is also no malign effect of tax incentives. For example, if locations maximize tax revenues and are not allowed to offer tax incentives, then locations will act like local monopolies. Taxes will be too high, and too few firms will come to the location. Just as price discrimination creates an efficient level of consumption of a monopolist's product, tax discrimination creates a more efficient allocation of firms across space. Likewise, in the ex post appropriate case, tax incentives are needed to undo the distortions that are created by governmental expropriation. In these cases, tax incentives would help to eliminate distortions that would otherwise be created by local taxing.

The only theory that suggests that tax incentives would create spatial distortions is the corruption and influence theory. If this theory is correct, firms will move to locations that offer the most generous packages, and the magnitude of these packages will be based exclusively on the venality of the local government. Obviously, choosing location on the basis of which area is most susceptible to bribery will not be likely to lead to efficient outcomes. As such, this theory predicts that tax incentives will probably lead firms to locate in the wrong places.

Overall, this analysis suggests that almost all of the theories predict that location decisions will be better with tax incentives than without these incentives. Local taxes often distort locations (unless they are perfectly tied to the cost of local services). Agglomeration economies mean that private firms' decision-making will not internalize important spillovers. The existence of tax incentives can, in principle, remedy these problems and banning these incentives will make things worse. The only exception occurs if tax incentives are based primarily on corruption and influence.

*Normative Question # 2: Will tax incentives lead mobile firms to get too many rents and will this lead to underprovision of other public goods?*

The bulk of the public finance literature on tax competition has focused more on the “race to the bottom” of tax levels than on any other impact. The models which argue that tax competition does bad things suggest that locations will cater to mobile residents and deprive their less mobile residents of needed public services (see e.g. Wilson, 1986; Ziedrow and Mieszkowski, 1986). As such, the reduction in income associated with tax incentives will produce underprovision of socially productive public goods.

Alternatively, followers of Tiebout stress that local tax competition disciplines the leviathan aspects of local government (see e.g. Brennan and Buchanan, 1980). According to this literature, local government expenditures naturally tend towards inefficiency and waste. Tax competition eliminates this waste.

I think that the existence of tax competition can be seen as being an income transfer where funds are transferred from the local government to mobile firms. This is clearly a boon for the shareholders of these firms. The question is what are the losses from depriving the localities of income. If local governments acted as an oligopoly rather than as separate competing entities, they could charge higher taxes and this would increase their funds. Would this be better?

There is no question that, in principle, this can be worse. The mobility of firms certainly stops some localities from redistributing to the poor. However, the mobility of the rich also stems the ability of localities to redistribute. More to the point, I think that mobility generally means that local redistribution is almost always a bad idea. Tax incentives may certainly limit the ability to engage in local redistribution, but probably that local redistribution should never have gone on in the first place.

More generally, will reducing the income available to local governments cause a loss in social welfare. This answer can certainly not be answered in the abstract. Economists

need to estimate what happens when localities are deprived of the marginal dollar. Does this loss lead to eliminating very valuable services or are fairly marginal services cut off? In principle, anything that local competition does can be offset by transfers from the central government. My suspicion is that optimal policy always involves allowing localities to compete with tax incentives (unless we are sure that those transfers are motivated by corruption). Then if localities are thought to make highly efficient use of the marginal dollar, money can be transferred to those localities.

Of course, tax incentives will have redistributive effects, even beyond its negative impact on local redistribution. Taxes will lead to a transfer in rents from less mobile firms to more mobile firms. I'm not sure why this type of redistribution between one type of shareholder to another is a particularly pressing subject for government action. However, if this type of redistribution is thought to be highly undesirable, it can always be cut off by central government action. I cannot help thinking that the best way to handle the redistributive impacts of redistribution is not to eliminate competition, but to have a separate redistribution policy.

#### **IV. Conclusion**

Tax incentives seem to be a permanent part of the urban economic landscape. However, economists do not yet know why these incentives occur and whether they are in fact desirable. These two questions are intrinsically linked. Hopefully, Garcia-Mila and McGuire's paper will lead to further investigation of these questions. In ten years, I hope that we will be able to conclusively reject some of the theories discussed above and that we will be closer to knowing what is really going on with these incentives.

My discussion suggests that tax incentives will almost surely improve the efficiency of the locational decisions of firms. The only case where this is not true occurs when tax incentives are driven by corruption and influence. Tax incentives may lead to a redistribution from local governments to mobile firms. However, the efficient response

to this redistribution should be a central government redistribution policy, not eliminating local government competition.

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