Inter-City Competition for Heterogeneous Creative Class Members Using Tax Policy

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Abstract

We analyze inter-city competition between two cities A and B that use taxes to attract heterogeneous members of the creative class. There are three types of creative class members and each type represents a particular occupation. Irrespective of type or occupation, creative class members value local public goods and each city levies a tax to drawn in as many members of the creative class as possible by providing an apposite local public good. In this setting, we accomplish two tasks. First, we describe the equilibrium allocation, i.e., a tax rate for each city and an allocation of creative class members to the two cities. Second, we compare and contrast this equilibrium allocation with the Pareto efficient allocation.

1. Introduction

1.1. Preliminaries

In the realm of urban development and economic prosperity, Richard Florida's groundbreaking concept of the *creative class* has been a guiding force for cities aspiring to enhance innovation, economic growth, and cultural vibrancy. Florida first introduced this concept in his seminal 2002 tome, *The Rise of the Creative Class*, where he argued that the key to a city's success lay in attracting and retaining a diverse group of creative individuals.

The creative class, as conceptualized by Florida in the above-mentioned tome and in subsequent work (see Florida 2005, 2008), encompasses a broad range of professionals, including scientists, artists, engineers, designers, and knowledge workers. These individuals share a common feature in their reliance on creativity and innovation in their work. Florida (2002, 2003, 2014) has repeatedly contended that cities that are able to successfully attract and cultivate this creative class will experience heightened economic growth, cultural richness, and overall prosperity.

Florida identifies three critical factors that contribute to a city's ability to attract the creative class, commonly known as the "three Ts" which denote talent, technology, and tolerance. Talent involves the availability of a skilled and diverse workforce. Technology refers to a city's capacity for innovation and access to cutting-edge resources.

Tolerance, perhaps the most distinctive aspect of Florida's theory, emphasizes a city's inclusivity and its acceptance of diverse lifestyles, cultures, and ideas.

There is evidence---see Huggins and Clifton (2011), Florida (2014), and Tiruneh (2014)---which shows that the economic impact of the creative class is profound, as these individuals contribute significantly to a city's gross domestic product (GDP) through their innovative endeavors. Moreover, creative class members tend to create a multiplier effect by attracting businesses, investors, and additional talent to a city. As a result, cities that successfully embrace and support the creative class often experience higher levels of economic stability and growth.

1.2. Objectives

Suppose one accepts Florida's contention that cities seeking to prosper economically need to attract members of the creative class. The next question then is: How are cities to do this? Researchers such as Florida (2002, 2008), Buettner and Janeba (2016) and Batabyal *et al.* (2019) have argued that since creative class members in general are interested in locating in cities that provide local public goods (LPGs)[4] such as cultural amenities, quality schools, and public transit, cities can attract creative class members by providing a variety of LPGs.

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As noted by Hindriks and Myles (2013, p. 208), a local public good "has the feature that its benefits are restricted to a particular geographical area and it cannot be enjoyed outside of that area."

How is the provision of LPGs by cities to be financed? One possibility is to use tax policy and there are studies---see Batabyal and Nijkamp (2022) and Batabyal and Yoo (2022)---that have looked into the role that taxes can play in drawing in creative class members to cities. That said, to the best of our knowledge, there are *no* theoretical studies that have analyzed how taxes might be used to attract creative class members to cities when these members are not homogenous but *heterogeneous*. In other words, consistent with what we have noted in section 1.1, we model the point that some members of the creative class are, for instance, artists, others are engineers, and yet others are scientists, and they are not all artists or all engineers or all scientists.

Given this lacuna in the literature, in this note, we study inter-city competition between two cities A and B that use taxes to attract heterogeneous members of the creative class. Section 2 describes the theoretical framework in which there are three types of creative class members and each type denotes a particular occupation. Irrespective of type, creative class members value LPGs and each city levies a tax to draw in as many members as possible by providing an apposite LPG. In this setting, we accomplish two tasks. Section 3 describes the equilibrium allocation, i.e., a tax rate for each city and an allocation of creative class members to the two cities. Section 4 compares this equilibrium allocation with the Pareto efficient allocation. Section 5 concludes and then suggests three ways in which the research described in this note might be extended.

2. The Theoretical Framework

Consider a static, aggregate economy of two geographically proximate cities denoted by $j = A, B$. Examples of such cities in the United States include Minneapolis and Saint Paul in Minnesota, Buffalo and Rochester in New York, and Dallas and Fort Worth in Texas. The objective of the relevant authority in each city is to attract creative class members to its city by providing a LPG whose provision is financed with taxes.

We study three types of creative class members who have distinct occupations and we denote these three types by $i = 1, 2, 3$. There are $N > 0$ creative class members of each type. The income possessed by a creative class member is denoted by $I > 0$ and this income is, for analytical tractability, independent of her type. To fix ideas, the reader may want to think of type 1 as artists, type 2 denoting engineers, and type 3 representing scientists. That said, it should be noted that our subsequent analysis is independent of the occupational name that is assigned to each one of the three types.

In addition to the LPG which we denote by G, there is a private good in the model which we denote by x. The utility of each type of creative class member depends on her consumption of the LPG (G) and the private good (x). The utility function itself is assumed to be quasi-linear and is given by

$$U_i = \beta_i \log\{G\} + x, \tag{1}$$

where β_i is a positive coefficient and $i = 1, 2, 3$. Finally, in our subsequent analysis, without

loss of generality, we suppose that $\beta_1 < \beta_2 < \beta_3$. Our next task is to delineate the

equilibrium allocation or, put differently, to describe a tax rate for each city and an

allocation of creative class members to the two cities under study.

3. The Equilibrium Allocation

Let us denote the taxes levied by the two cities by $\tau_A \geq 0$ and $\tau_B \geq 0$. Also, let the

relevant populations in these two cities be denoted by $N_A > 0$ and $N_B > 0$. Now, some

thought ought to convince the reader that in our equilibrium allocation, we are looking for

a tax rate for each city and an allocation of creative class members to the two cities with

the proviso that *no* member would like to change the city to which she has been assigned.

That said, the budget constraint confronting the relevant authority in each of the

two cities is given by

$$\tau_A N_A = G_A \text{ and } \tau_B N_B = G_B, \tag{2}$$

where G_A (G_B) is the amount of the LPG provided in city A (B). Recall that an allocation

is an equilibrium if *no* creative class member wants to move from the city to which she

has been assigned. This means that for city A, substituting from equation (2) into equation

(1), a specific inequality must hold and that inequality is

$$\beta_i \log\{\tau_A N_A\} + I - \tau_A \geq \beta_i \log\{\tau_B(N_B + 1)\} + I - \tau_B. \tag{3}$$

Using the same line of thinking, the corresponding inequality that needs to hold for city B

is

$$\beta_i \log\{\tau_B N_B\} + I - \tau_B \geq \beta_i \log\{\tau_A(N_A + 1)\} + I - \tau_A. \tag{4}$$

For any one of the three possible types of creative class members, equation (3) says

that if located in city A then the net utility from residing in city A must be at least as

high as the net utility from residing in city B. Similarly, for the same three types of creative

class members, equation (4) tells us that if situated in city B then the net utility from

living in city B must be at least as high as the net utility from living in city A. In other

words, equations (3) and (4) are telling us that for any type of creative class member, this

member compares the net utility of the *present* allocation with the net utility from *moving*

to the other city.

Given the structure of our model, some thought and analysis reveal that four

possible kinds of equilibria arise. In the first kind, both cities A and B levy a tax of *zero*

$(\tau_A = \tau_B = 0)$ and all the creative class members are indifferent between residing either in

city A or city B. When this happens, the level of the LPG is zero, i.e., the LPG is not

provided at all, and no creative class member has any incentive to move from one city to the other.

In the second kind of equilibrium, both cities levy the same *positive* tax ($\tau_A = \tau_B > 0$). All members of the creative class are situated in the same city and they strictly prefer to be there as opposed to moving to the other city. If a particular creative class member were to move from her current city to the other city, then her tax payment would remain the same but the amount of the LPG provided would decline.

In the third kind of equilibrium, type 1 and type 2 creative class members choose to locate in city A and type 3 creative class members locate in city B. Further, the tax levied by city A is *less* than the tax levied by city B ($\tau_A < \tau_B$). To understand why this situation constitutes an equilibrium, recall our assumption that the positive coefficients of the three utility functions follow the pattern $\beta_1 < \beta_2 < \beta_3$. This third kind of equilibrium corresponds to the situation in which the gap between β_2 and β_1 or $|\beta_2 - \beta_1|$ is small but the gap between β_3 and β_2 or $|\beta_3 - \beta_2|$ is relatively large.

The fourth and final kind of equilibrium is asymmetrically related to the third equilibrium described above. However, the scattering of the creative class members follows a different pattern. Specifically, now type 1 creative class members locate in city A and types 2 and 3 creative class members locate in city B. Once again, the tax levied by city A is *less* than the tax levied by city B ($\tau_A < \tau_B$). As with the third equilibrium, this

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equilibrium corresponds to the situation in which the gap between β_3 and β_2 or $|\beta_3 - \beta_2|$ is small but the gap between β_2 and β_1 or $|\beta_2 - \beta_1|$ is relatively large.

Some thought ought to convince the reader that given the structure of our model, it is not possible to have an equilibrium in which type 2 creative class members are divided between the two cities A and B. Similarly, it is also not possible for an equilibrium to exist in which types 1 and 3 creative class members locate in one city and type 2 creative class members locate in the other city. Our next and final task in this note is to compare the equilibrium allocation of this section with the Pareto efficient allocation.

4. Pareto Efficient Allocation

We begin by noting that an equilibrium is Pareto efficient when no change in either the tax rates or the location of the creative class members can increase the welfare of a creative class member without reducing the welfare of another creative class member. So, to see if a particular allocation is an equilibrium, we move a single creative class member from one city to the other and then study her payoff while keeping the two tax rates fixed. In other words, the notion of Pareto efficiency needs to be tested against any reallocation of the creative class population and any variation in the two tax rates.

In our model, the nature of the Pareto efficient allocations can be understood by recognizing that there are two competing forces at work. We refer to these two forces as the *agglomeration* and the *heterogeneity* effects. On the one hand, an agglomeration of the

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entire creative class population in a single city raises the quantity of the LPG for a given tax rate (see equation (2)). On the other hand, having the entire creative class population locate in one city forces a single tax rate onto a heterogeneous population. Therefore, the makeup of the Pareto efficient allocations is determined by which of these two competing effects is the strongest.

Consider the simplest case in which $\beta_1 = \beta_2 = \beta_3$. Clearly, in this case, the heterogeneity effect is irrelevant and only the agglomeration effect applies. Therefore, it is Pareto efficient to have the entire creative class population locate in a single city with the tax rate set at the level that maximizes the utility of the creative class members. Now, by using the mathematical notion of continuity, we infer that when β_1 is close to β_3, the entire creative class population is located in one city and the tax rate lies anywhere between the rate preferred by the type 1 and the type 3 creative class members.

When β_1 is sufficiently different from β_3, the heterogeneity effect is what matters and therefore the creative class population needs to be split up between the two cities A and B. Further, if β_2 is close to β_1 then creative class members of types 1 and 2 ought to be situated together in the same city with the tax rate lying anywhere between the rates preferred by the type 1 and the type 2 creative class members. Type 3 creative class members, on the other hand, should be situated in the other city and these members ought to face their preferred tax rate. Finally, if β_2 is close to β_3 then the creative class members

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of types 2 and 3 ought to be located together in one city, facing a tax rate that lies between the tax rates preferred by the type 2 and type 3 creative class members. In addition, type 1 creative class members ought to be situated in the other city and these members ought to face their preferred tax rate. This completes our discussion of inter-city competition for heterogeneous creative class members using tax policy.

5. Conclusions

In this note, we studied inter-city competition between two cities A and B that used taxes to attract heterogeneous members of the creative class. There were three types of creative class members and each type represented a specific occupation. Irrespective of the type or occupation, creative class members valued LPGs and each city levied a tax to attract as many members as possible by providing a suitable LPG. In this setting, we carried out two tasks. First, we described the equilibrium allocation, i.e., a tax rate for each city and an allocation of creative class members to the two cities. Second, we compared and contrasted this equilibrium allocation with the Pareto efficient allocation.

It is possible to extend the analysis in this note in a number of different directions. In what follows, we suggest three possible extensions. First, it would be useful to model the interaction between creative class members and city authorities in an intertemporal setting in which the quality and the quantity of the LPGs that are provided changes over time. Second, it would be instructive to analyze the interaction between creative class

members and city authorities when the aggregate economy under consideration consists of three or more cities. This would permit a researcher to use insights from the economics of networks---see Jackson (2008)---to analyze the interactions between the three or more cities in interesting ways. Finally, it would also be informative to analyze the interactions between creative class members and multiple cities when cities provide more than one LPG and it is possible, even within a type, for creative class members to express dissimilar preferences about these multiple LPGs. Studies that analyze these facets of the underlying problem will provide further insights into the nature of the dealings between potentially mobile creative class members and city authorities that would like to attract these members to their respective cities.

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