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Batabyal, Amitrajeet

Rochester Institute of Technology

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How Many Members of the Creative Class Should a City Seek to Attract?[1]

by

AMITRAJEET A. BATABYAL[2]

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Department of Economics, Rochester Institute of Technology, 92 Lomb Memorial Drive, Rochester, NY 14623-5604, USA. E-mail: aabgsh@rit.edu

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Abstract

In this note, we focus on the decision problem faced by a city authority (CA) who seeks to attract members of the creative class to her city by providing a local public good (LPG). We construct a stylized model of this interaction and shed light on three questions. First, we determine the optimal number of creative class members to attract when the CA maximizes the utility of *each* member who chooses to reside in the city. Second, assuming the CA provides the LPG optimally *given* the total number of resident members, we compute the *loss* borne by this CA from having a suboptimal number of members living in the city. Finally, we ascertain what number of members living in the city maximizes the *total* utility obtained by the CA and then compare this answer with our answer to the first question stated above.

Keywords: City Authority, Creative Class, Local Public Good, Optimal Membership

JEL Codes: R11, R50

1. Introduction

A key question confronting regional scientists, urban economists, and urban planners relates to what steps a city authority (CA) might take to ensure that her city prospers economically in this era of globalization. One clear answer to this question has been provided by Richard Florida in his now copious writings---see Florida (2002, 2003, 2005, 2008, 2014)---on this subject. According to Florida, cities and more broadly regions that want to blossom in this period of globalization need to do all they can to attract and retain members of what he calls the *creative class*. The creative class "consists of people who add economic value through their creativity" (Florida, 2002, p. 68). Specifically, this class is composed of specialists such as engineers, information technology professionals, medical doctors, scientists, university professors, and, markedly, bohemians such as artists, musicians, and sculptors.

We concentrate on cities in this note and we acknowledge Florida's (2002) basic contention that cities seeking to flourish economically need to attract and hold on to members of the creative class. Once this is done, two questions follow naturally. The first question is: "How are cities to do this?" The second question is: "How many members of the creative class should a CA seek to attract?

As far as the first question above is concerned, Clifton (2008), Qian (2010), Van Holm (2014), Dalwai (2016), Smiley *et al*. (2016), Rao and Dai (2017), Vossen *et al*. (2019), and Batabyal and Yoo (2020a) have all shed light on this question and have made the point that natural or produced urban amenities such as views, climate, public transit and theatres can be used by a CA to carry out the twin "attract" and "retain" tasks mentioned above. Note that amenities are salient because they provide comfort, convenience, or enjoyment to users.

A second and related answer to the first question stated above has been provided by Ten Brink (2012), Buettner and Janeba (2016), Batabyal and Beladi (2019), Batabyal *et al.* (2019), and Batabyal and Yoo (2020b, 2020c). These researchers have shed light on this question by pointing out that produced local public goods (LPGs)[3] such as local public parks and schools can be used by a CA to carry out the "attract" task.[4] In this regard, Ten Brink (2012) presents a general discussion of how cities can utilize LPGs to attract new residents. Batabyal *et al*. (2019) examine a model in which the creative class members are able to move between the two cities that they study. In this setting, they first describe the equilibrium distribution of the creative class in the two cities and then determine whether the provision of a LPG is efficient.

Batabyal and Beladi (2019) build on this work and analyze a model of competition between two cities that use a LPG to draw in members of the creative class. They follow Batabyal and Beladi (2018) and split up the total creative class population into "artists" and "engineers." They then carry out the remainder of their analysis with a representative artist and a representative engineer. Batabyal and Yoo (2020b) show that the use of a "representative artist and engineer" modeling strategy can lead one to concentrate on an inefficient equilibrium in the aggregate economy of two cities. Finally, Batabyal and Yoo (2020c) also analyze a model with two cities and point out that the provision of the LPG in either city is inefficient because the CA is able to choose *only* the optimal amount of the LPG to provide and not, also, the optimal number of creative class members to attract to her city.

This last result obtained by Batabyal and Yoo (2020c) logically leads to the second question stated above about how many creative class members a CA ought to attract to her city.

3 See Hindriks and Myles (2013, chapter 7) for a textbook exposition of LPGs.

4 See Hansen and Niedomysl (2009), Richardson (2009), and Audretsch and Belitski (2013) for a discussion of related issues.

To the best of our knowledge, this salient question has received *no* previous theoretical attention in the extant literature in regional science. Therefore, our primary objective in this note is to use a simple theoretical framework and shed light on this question.[5]

The remainder of this note is arranged as follows: Section 2.1 delineates our stylized model of the interaction between a CA and members of the creative class. Section 2.2 ascertains the optimal number of creative class members to attract when the CA maximizes the utility of *each* member who chooses to live in the city. Section 2.3 first assumes that the CA is providing the LPG optimally *given* the total number of resident members and then computes the *loss* borne by this CA from having a suboptimal number of members living in the city. Section 2.4 determines what number of creative class members living in the city maximizes the *total* utility derived by the CA and then compares this answer with our answer in section 2.2. Finally, section 3 concludes and then suggests two ways in which the research delineated in this paper might be extended.[6]

2. The Model

2.1. Preliminaries

Let us begin by recognizing that the creative class, in general, consists of a variety of specialists such as artists, engineers, information technology professionals, sculptors, university

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We acknowledge that the question of how best and how many creative class members to attract either to a city or to a region, when studied in full generality, is a complex one. That said, we contend that the complexity of the general question does *not* mean that partial equilibrium analysis that focuses on the key features of the underlying problem is invalid. If that were the case then a significant amount of the existing theoretical research in economics and regional science would be rendered invalid. To the best of our knowledge, we accomplish two tasks in this note, for the *first* time. The first task is to answer the specific research question that we have just stated and which has *not* been studied theoretically in the extant literature. The second task is to show how insights from the literature on club goods can be used to shed light on the above research question.

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It is true that since the publication of the tome titled *The Rise of the Creative Class* by Richard Florida in 2002, a lot has been written about the pros and cons of the creative class from a variety of different perspectives. Readers can easily familiarize themselves with this literature by perusing the many studies that we cite and by perusing the various references cited in these individual studies. That said, it is important to comprehend that most of this literature is either empirical or based on case studies. Hence, there is a great need for theoretical analyses of the creative class and this is where our study contributes to the extant literature. Finally, we stress that the present study is a note and *not* a full-length paper. That is why we are studying three specific, interrelated questions and *not* engaging in a detailed analysis of the sort one would expect in a full-length paper. We are presently at work on such a full-length paper and we expect to report the results of our research in the near future.

professors, and is therefore heterogeneous. That said, as pointed out by Batabyal and Yoo (2020c), a city that is looking to attract members of the creative class is generally *not* looking to attract every possible type of member. In other words, a city like San Francisco is more likely to be interested in attracting information technology professionals and, in contrast, a city like Washington DC is probably more interested in drawing in lawyers. In addition, even if a CA wanted to attract multiple types of creative class members to her city, it is unreasonable to think that she would be able to do so by offering a *single* LPG.

Therefore, to focus the subsequent discussion, we suppose that a CA is looking to attract a specific *subset* of members in the creative class such as lawyers or medical doctors. Because these members are either all lawyers or all medical doctors, and so and so forth, we can think of this subset of members as *homogeneous*.

Now, consider a city with a CA. Let us denote the LPG that is provided by this CA to the relevant creative class members by $L > 0$. We suppose that $N \geq 1$ creative class members live in this city. The income possessed by any one creative class member is $I > 0$. When a particular creative class member---attracted by the LPG on offer---decides to live in this city and the CA provides L to the N members who live in the city, this individual member obtains utility u denoted by the function

$$u = I - \frac{L}{N} + \log{(L)} - \frac{N}{k}. \quad (1)$$

The ratio L/N in equation (1) is the tax paid by this individual creative class member to live in the city and enjoy the LPG that is provided by the CA and k is a positive constant. Inspecting equation (1), we see that an individual creative class member's utility is (i) increasing in his personal income I, (ii) decreasing in the tax L/N that he has to pay, (iii) increasing in the amount of the LPG L that is provided, and (iv) decreasing in the ratio N/k that contains the total number of creative class members N that are living in the city.

The ratio N/k can be viewed as a congestion factor. As such, the fact that this ratio appears in the utility function in equation (1) with a minus sign tells us that this ratio captures the disutility to an individual creative class member from there being too many other members of the same type in the city under study. Looked at in this way, when an artist, for instance, is deciding whether to pay the tax L/N for the LPG offered by the CA and live in this city, he considers how many other artists there already are and too many artists make the city "congested with artists" and hence detracts from his utility. The positive constant k modulates the magnitude of the disutility from the congestion factor N/k. So, *ceteris paribus*, as k goes down (up), the congestion factor becomes larger (smaller), and the disutility from congestion rises (falls).

With this description of the model out of the way, our next task is to ascertain the optimal number of creative class members the CA ought to attract when she maximizes the utility of *each* member who chooses to live in the city.

2.2. Focus on individual utility

The CA chooses how much of the LPG to provide and how many creative class members to attract to her city to maximize the utility of each resident creative class member. Mathematically, she solves

$$max_{\{L,N\}}\left\{I-\frac{L}{N}+\log{(L)}-\frac{N}{k}\right\}. \tag{2}$$

Differentiating this maximand with respect to L and N gives us the two first-order necessary conditions for an optimum. We get[7]

$$\frac{\partial u}{\partial L} = \frac{1}{L} - \frac{1}{N} = 0, \quad (3)$$

and

$$\frac{\partial u}{\partial N} = \frac{L}{N^2} - \frac{1}{k} = 0. \quad (4)$$

Simplifying equations (3) and (4) gives us $L = N$ and $N = k$ respectively.[8] Substituting these last two findings into the utility function given in equation (1) yields

$$u(N^*) = I + \log(k) - 2. \quad (5)$$

Equation (5) tells us two things. First, the optimal number of creative class members that the CA ought to attract to her city or N^* is given implicitly by the solution to this equation. Second, equation (5) also gives us the maximized value of utility to each creative class member when the CA attracts the optimal number of members to the city under study.

Let us now analyze whether we are accounting for both the benefits and the costs of co-location by creative class members in the city under study. Observe that because we have explicitly included the congestion factor N/k in the utility function in equation (1), we obviously *are* accounting for the costs. We also know that the optimal number of creative class members attracted

[7] We are ignoring integer issues here or, alternately, we are assuming that the optimal integer N can be well approximated by the optimal continuous N.

[8] The second-order sufficiency conditions are satisfied.

to our city or $N^* = L = k > 0$. So, given that a positive number of members are attracted to our city, this *positivity* captures the benefits of co-location. In other words, as more and more members are attracted to our city by the CA, the benefits and the costs of co-location both grow. However, when N^* members are attracted, the benefits are as *large* as possible and the costs stemming from congestion are as *small* as possible. This explains why we solved a utility maximization problem to determine N^* and, in the process, optimally tradeoff the benefits and the costs of co-location. Substituting $N^* = k$ in equation (1) we see that the numerical value of the congestion factor is $k/k = 1$ and this is also its optimal value. It is easy to confirm that if the CA attracts not N^* creative class members but, say, $N^* + 1$ members then the value of the congestion factor will *deviate* from its optimal value and be larger than unity, thereby *increasing* the disutility from congestion to an individual creative class member.

We now concentrate on a setting in which the CA is assumed to provide the LPG optimally *given* the total number of resident creative class members. Our goal here is to compute the *loss* borne by this CA from having a suboptimal number of members living in the city.

2.3. Loss from a suboptimal number of residents

Suppose that the number of creative class members that are attracted to the city is $M \neq N$. Our analysis in section 2.2 tells us that the optimal value of the LPG now is $L = M > 0$. Therefore, substituting this value of the LPG into equation (1) tells us that the utility obtained by each creative class member when M members are living in the city is

$$u(M) = I - 1 + \log(M) - \frac{M}{k}. \tag{6}$$

Therefore, the loss to the CA from having attracted a suboptimal number of creative class members to her city is given by subtracting the right-hand-side (RHS) of equation (6) from the RHS of equation (5). Doing this, we get

$$u(N^*) - u(M) = \frac{M}{k} + \log\left(\frac{k}{M}\right) - 1. \quad (7)$$

Inspecting equation (7), we see that the loss to the CA is *independent* of the amount of the LPG or L she provides and an individual creative class member's income I. In fact, if we set aside the positive constant k temporarily then we see that this loss depends entirely on the suboptimal number of members attracted to the city or M.

What happens to this loss if there is an incremental increase in the number of members attracted to and hence living in the city? We can answer this question by differentiating the RHS of equation (7) with respect to M. Doing this, we get[9]

$$\frac{\partial\{u(N^*) - u(M)\}}{\partial M} = \frac{1}{k} - \frac{1}{M}. \quad (8)$$

The obvious implication of equation (8) is that the loss to the CA increases (decreases) depending on whether $k^{-1} > (<)\ M^{-1}$. Our final task in this note is to first determine what number of creative class members living in the city maximizes the *total* utility obtained by the CA and to then compare this answer with our answer in section 2.2.

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Also see footnote 7.

2.4. Focus on total utility

Let us denote the total utility to the CA by U. Then, some thought ought to convince the reader that this total utility is given by multiplying the individual utility or u given in equation (1) by the number of creative class members who live in the city or N. Doing this, we get

$$U = Nu = N\left\{I - \frac{L}{N} + \log(L) - \frac{N}{k}\right\}. \tag{9}$$

The CA's maximization problem now is to solve

$$max_{\{L,N\}}\left[N\left\{I - \frac{L}{N} + \log(L) - \frac{N}{k}\right\}\right]. \tag{10}$$

The first-order necessary conditions for an optimum are[10]

$$\frac{\partial U}{\partial L} = \frac{N}{L} - 1 = 0 \tag{11}$$

and

$$\frac{\partial U}{\partial N} = I + \log(L) - \frac{2N}{k} = 0. \tag{12}$$

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The second-order sufficiency conditions are satisfied and, as noted in footnote 7, we are ignoring integer issues.

Simplifying equations (11) and (12), we see that optimality calls for setting $L = N$ and that the optimal N itself is given implicitly by the solution to the equation

$$I + \log(N) = \frac{2N}{k}. \tag{13}$$

We are now in a position to compare the outcome when the CA maximizes the utility of *each* member residing in the city (the individual utility or section 2.2 case) with the corresponding outcome when the CA maximizes the *total* utility of all the creative class members living in the city. Comparing equations (4) and (13), we see that in contrast to the "individual utility case," the optimal number of creative class members that the CA ought to attract when her focus is on total utility *depends* on an individual member's income I.

To make further progress in this comparative exercise, let us evaluate the partial derivative $\partial U/\partial N$ on the left-hand-side (LHS) of equation (12) at $L = N$ and $N = k$. This gives us

$$\frac{\partial U}{\partial N}|_{L=N,N=k} = I + \log(k) - \frac{2k}{k} = 0 \Rightarrow I + \log(k) = 2 > 0. \tag{14}$$

Equation (14) tells us that the sign of $\partial U/\partial N$ at $L = N$ and $N = k$ is positive. From this we infer that k now is *smaller* than the optimal value. Further, using equations (13), (14), and our analysis thus far, we reason that if $I + \log(k) > 2$ then the LPG provided or L and the number of creative class members attracted to live in the city or N are both *higher* than the corresponding values in the "individual utility case" studied in section 2.2. Finally, these last couple of results together also tell us that the utility obtained by an individual creative class member in this "total utility case" must be *lower* than the corresponding utility obtained by him in the section 2.2 "individual utility case” for all $k \geq 1$. This concludes our discussion of how many members of the creative class a CA should seek to attract to live in her city.

3. Conclusions

In this note, we analyzed the decision problem faced by a city authority (CA) who attempted to attract members of the creative class to her city by providing a LPG. We constructed a stylized model of this interaction and shed light on three questions. First, we determined the optimal number of creative class members to attract when the CA maximized the utility of *each* member choosing to reside in the city. Second, assuming the CA provided the LPG optimally *given* the total number of resident members, we computed the *loss* borne by this CA from having a suboptimal number of members living in the city. Finally, we ascertained what number of creative class members living in the city maximized the *total* utility derived by the CA and then we compared this answer with our answer to the first question stated above.

The analysis in this paper can be extended in several directions. Here are two possible extensions: First, it would be interesting to model the interaction between a CA and creative class members in a dynamic setting and to then analyze the trajectory of the optimal number of members that are attracted to the city over time. Second, it would also be instructive to partition the relevant creative class population into different sets and to then analyze how effective a CA is in attracting these different sets of members to her city with a LPG and other policy instruments. Studies that analyze these aspects of the underlying problem will provide additional insights into the nature of the static and dynamic interactions between creative class members and city authorities.

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