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Abstract

We analyze interregional competition between two regions A and B that use taxes to attract a representative creative class member (the entrepreneur). This entrepreneur establishes a firm in either region A or B and this action guarantees her profit. However, if the entrepreneur locates in region A then she also obtains a stochastic, location-specific rent that is either high with positive probability or low with positive complementary probability. In this setting, we accomplish three tasks. First, given values of the two tax rates, we determine the payoff to the entrepreneur in the two regions for the two possible values of the location-specific rent in A. Second, we ascertain when the entrepreneur will locate in A for both values of the rent and when she will locate in B. Finally, we compute the tax rate that B will set and then specify a condition which ensures that the entrepreneur locates in B.

Keywords: Creative Class, Entrepreneur, Interregional Competition, Region-Specific Rent, Tax

JEL Codes: R12, H25

1. Introduction

The urbanist Richard Florida (2002, 2003, 2005, 2008, 2014) has pointed out in a number of well-known books and papers that regions that want to prosper in this era of globalization need to do all they can to attract and retain members of the so-called *creative class*. Why? This is because members of the creative class are fundamentally entrepreneurial in nature and, as such, they are the primary drivers of regional economic growth and development.

Once one accepts Florida's claim that regions seeking to thrive economically need to attract the entrepreneurial members of the creative class, the next logical question is the following: "How are regions to do this?" Two broad answers to this question have been offered in the literature. The first answer is the one provided by Florida (2002, 2008), Buettner and Janeba (2016) and Batabyal *et al.* (2019). These researchers have answered the above query by demonstrating that regions can utilize local public goods such as cultural amenities, quality schools, and public transit to effectively carry out the "attract" function.[4] The second answer has been postulated by Batabyal and Beladi (2021), Batabyal and Nijkamp (2022), and Batabyal and Yoo (2022). These researchers have pointed out that tax policy can be used to draw in members of the creative class into a particular region.[5]

The usefulness of tax policy in attracting the entrepreneurial creative class into a region has been explored from a variety of perspectives in the extant literature. Even so, the paper by Brueckner and Saavedra (2001) notwithstanding (see footnote 2), to the best of our knowledge, *no*

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See Audretsch and Belitski (2013) and Batabyal and Nijkamp (2016) for a discussion of related issues.

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In an early paper that has some superficial similarities with our objective in this note, Brueckner and Saavedra (2001) econometrically analyze how local jurisdictions select property tax rates, taking into account the possibility of capital migrating in response to tax differentials. We emphasize that the primary thrust of this paper is *econometric*, there is *no* discussion of a region-specific rent here, and this paper has *nothing* to do with attracting the creative class to one or more regions. That said, we do not undertake a detailed analysis of the strategic or game-theoretic interaction between two regions because such an analysis is *beyond* the scope of this note and, in addition, Batabyal and Nijkamp (2022) have already undertaken this kind of analysis very recently.

one has studied the effectiveness of tax policy in attracting creative class members into a particular region when one region, in an aggregate economy of multiple regions, has an inherent advantage in the sense that locating in this region enables an entrepreneurial creative class member to enjoy a *region-specific rent*. Given this lacuna in the literature, our objective in this note is to analyze how the existence of a region-specific rent affects the efficacy of tax policy in attracting creative class members to a particular region.[6] Before proceeding further, we would like to point out that Conley and Whitacre (2016), Falcioglu and Kurtoglu (2016), Batabyal and Yoo (2018), and Noonan *et al*. (2021) have analyzed alternate aspects of the regional behavior of entrepreneurial creative class members. That said, the reader should understand that there is absolutely *no* overlap between the contents of these papers and what we are studying in this note.

The remainder of this note is organized as follows: Section 2.1 delineates our static model of an aggregate economy consisting of two regions denoted by A and B that use taxes T^A and T^B to attract a representative creative class member who we shall think of as an entrepreneur. There is a probabilistic, location-specific rent in region A that can take on two possible values but there is no similar rent in region B. Given values of the two tax rates, section 2.2 determines the payoff to the entrepreneur in the two regions for the two possible values of the location-specific rent in A. Section 2.3 ascertains when the entrepreneur will choose to locate in A for both values of the rent and when she will choose to locate in B. Section 2.4 calculates the tax rate that region B will set and then it specifies a condition that guarantees that the entrepreneur locates in region B. Section

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We emphasize that the present contribution of ours is a note and *not* a full-length paper. We have clearly stated our objective in this paragraph and, in this regard, we stress that our objective here is *not* to provide a general theory of entrepreneurial location decisions and, more specifically, creative class location decisions. Even so, in section 2.1 below, we comment on how the theory we present here can be modified to distinguish between creative class and non-creative class entrepreneurs.

3 concludes and then suggests three ways in which the research described in this note might be extended.

2. Analysis

2.1. The theoretical framework

Consider a static, aggregate economy of two regions denoted by $i = A, B$. Each of these two regions competes for a representative member of the creative class---who we shall think of as an entrepreneur---with its choice of a particular tax. Even though we do not cast our analysis in this note in terms of a formal "game" between the representative member of the creative class and the two regions, our analysis is somewhat similar to the kind of analysis one undertakes in "Cournot games" in which the relevant players move simultaneously. That said, there are two key differences. First, in our model, the players do not pick quantities and hence the interaction we study is not a quantity setting game. Second, the representative member of the creative class in our model chooses a region to locate in and the two regions choose their taxes.[7]

Let us represent the taxes used by the two regions by T^A and T^B respectively. Whichever region our entrepreneur decides to locate in results in the establishment of a firm. The manufacture of some final good by this firm leads to our entrepreneur earning profit Π, independent of the region she chooses to locate in.[8]

Our focus here is on a representative creative class entrepreneur. That said, three points now deserve additional commentary. First, it is certainly possible to think of the set of all entrepreneurs in our aggregate economy as being made up of the sum of all creative and non-

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[7] The model we analyze is not a Stackelberg game because there is no leader-follower interaction. For the same reason, it is not possible for one region to "react" to the other region's tax rate because our model is static and not dynamic.

[8] Precedents exist in the literature for modeling the return (Π) in a deterministic manner. See, for example, Batabyal (2021).

creative class entrepreneurs. As such, if we wanted to distinguish between creative and non-creative class entrepreneurs then one way in which we could do this would be to work not with a single profit term Π but with two profit terms Π_c and Π_{nc} where Π_c is the profit earned by a creative class entrepreneur and Π_{nc} is the profit earned by a non-creative class entrepreneur.

Second, when pondering the question about what distinguishes the behavior of creative class entrepreneurs from that of all other entrepreneurs, it is helpful to focus on what authors such as Howkins (2002) have called the "creative economy." The creative economy positions itself at the intersection of economics, innovation, social value, and sustainability. Creative class entrepreneurs work in the creative economy which is a much smaller part of the overall economy. Therefore, relative to all other entrepreneurs, creative class entrepreneurs are *much more focused* on generating new ideas, evaluating these new ideas critically, and taking (potentially collaborative) actions to turn these ideas into new products, services, and ultimately into profits.[9]

Finally, in principle, a creative or for that matter a non-creative class entrepreneur's decision to locate in either region A or B may depend on this entrepreneur's tolerance for risk. We do not explicitly analyze "risk tolerance" here because our goal in this note is *not* to focus on this issue but instead to study how the existence of a region-specific rent influences the efficacy of tax policy in attracting creative class members to a particular region. That said, one relatively straightforward way in which we could capture the notion of "risk tolerance" would be to posit that the profit from locating in either region is not deterministic but stochastic. In this case, we would replace all mentions of the profit Π with its expectation or $E[\Pi]$ and the remainder of the analysis would continue as shown in the following sections of this note.

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Also see https://www.thepolicycircle.org/minibrief/the-creative-economy/. Accessed on 2 January 2023.

In addition to this region independent profit Π, our entrepreneur also obtains a region-specific rent if she chooses to locate in and establish her firm in region A. To keep the subsequent analysis interesting, we suppose that this region-specific rent is *probabilistic*. In other words, this rent takes on either a high value given by ζ^H with probability $p > 0$ or a low value denoted by ζ^L with complementary probability $(1 - p) > 0$. It is understood that $\zeta^H > \zeta^L$. Generally speaking, a region-specific rent is an economic rent that is tied to a particular region, in our case region A. For instance, it may be a return to a factor of production that exceeds what this factor's owner requires in order to deploy the factor in region A, a return that could not be obtained in another region such as region B. Alternately, a region-specific rent could result from the skill level of the workforce in region A exceeding that of the workforce in region B. Finally, the rent could also arise because locating in region A permits our entrepreneur's firm to be situated closer to important inputs.[10]

Region A earns income I^A if our entrepreneur decides to locate in and establish her firm there and then this region levies the tax T^A. Similarly, region B earns income I^B if the entrepreneur decides to set up shop here and then this region charges the tax T^B. Consistent with our observation above, a second way in which we could distinguish between creative class and non-creative class entrepreneurs would be to specify that the income earned in region A is not I^A but I_c^A if a creative class entrepreneur locates in this region and I_{nc}^A if a non-creative class entrepreneur locates in this same region. A similar argument would apply for region B. It is important to comprehend that making such a distinction would complicate our algebraic analysis but it would *not* alter our central finding presented below in section 2.4.

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The region-specific rent clearly differentiates region A from B. That said, observe that in principle, we can think of this rent in "net" terms meaning that it is the gross rent less the cost of doing business in region A. When looked at in this way, the region-specific rent accounts for the cost of doing business in the region.

The two regions in our model select their tax rates and our entrepreneur chooses her firm's location before the region-specific rent is realized. The reader will appreciate that this assumption keeps our analysis interesting because the magnitude of the region-specific rent is not already known to the entrepreneur when she makes her location decision. In this sense, our analysis here is *ex ante* in nature. In contrast, if the magnitude of the region-specific rent were known in advance of the location selection decision by our entrepreneur then this decision problem would be analytically uninteresting and the question of differentiating between regions A and B would be a trivial task. That said, although this is not an objective of ours in this note, one could build a different model in which the goal would be to study either the location decision of an entrepreneur who is choosing between two cities in the same region or the extent to which this entrepreneur shares the region-specific rent when she chooses one city over another with both cities being in the same region.

With this description of our aggregate economy out of the way, our next task is to ascertain, given the two tax rates, the payoff to our entrepreneur in regions A and B for the two possible values of the location-specific rent in A.

2.2. The entrepreneur's payoff

It is clear that in region B, to determine our entrepreneur's payoff or P^B, we need to consider only (i) the profit to the established firm that is independent of this entrepreneur's location decision and (ii) the tax employed by region B or T^B. Hence, in symbols, our entrepreneur's payoff is given by

$$P^B = \Pi - \mathrm{T}^B. \tag{1}$$

In contrast, the payoff to our entrepreneur in region A or P^A depends not only on the location independent profit Π and the tax T^A but also on the realized value of the stochastic, location-specific rent in this region. Therefore, in symbols, the payoff to our entrepreneur is either

$$P^A = \Pi - \mathrm{T}^A + \zeta^H \tag{2}$$

or

$$P^A = \Pi - \mathrm{T}^A + \zeta^L. \tag{3}$$

Let us now describe when our entrepreneur will choose to locate in region A for both values of the rent and when she will choose to locate in region B.

2.3. The regional location decision

Using equations (2) and (3), our entrepreneur's expected payoff from locating in and establishing her firm in region A is

$$p\{\Pi - \mathrm{T}^A + \zeta^H\} + (1-p)\{\Pi - \mathrm{T}^A + \zeta^L\}. \tag{4}$$

Now using equations (1) and (4) together, it is clear that our entrepreneur will locate in and establish her firm in region A if and only if

$$p\{\Pi - \mathrm{T}^A + \zeta^H\} + (1-p)\{\Pi - \mathrm{T}^A + \zeta^L\} \geq \Pi - \mathrm{T}^B. \tag{5}$$

Simplifying both sides of the above inequality, after a couple of steps, we can rewrite the condition in (5) as

$$\bar{\zeta} \geq \mathrm{T}^A - \mathrm{T}^B, \tag{6}$$

where $\bar{\zeta} = p\zeta^H + (1-p)\zeta^L$. So, our entrepreneur locates in and establishes her firm in region A as long as the condition in (6) holds. Otherwise, the condition

$$\bar{\zeta} < \mathrm{T}^A - \mathrm{T}^B \tag{7}$$

holds and she locates and sets up her firm in region B.[11]

[11]

Our next tasks are to compute the tax rate that region B sets and to then state a condition that guarantees that our entrepreneur locates in region B.

2.4. Nullifying the region-specific rent

There is no location-specific rent in region B. Therefore, the only way for this region to attract our entrepreneur is by setting a negative tax or a subsidy. Now, the maximum subsidy in B must leave this region with a nonnegative payoff. This means that the condition

$$\mathrm{I}^B + \mathrm{T}^B \geq 0 \tag{8}$$

must hold. From the condition in (8), we infer that region $B's$ negative tax or subsidy can be expressed as

$$\mathrm{T}^B = -I^B. \tag{9}$$

In other words, region B will be willing to set the subsidy given in equation (8) to attract our entrepreneur because I^B is the maximum amount it earns from attracting the entrepreneur and ensuring the establishment of her firm in this region.[12]

Observing region $B's$ tax choice given in equation (9), region A will want to minimize its subsidy or, alternately, maximize its tax. This means that it will set its own tax rate so that

$$\mathrm{T}^A = \bar{\zeta} - I^B. \tag{10}$$

Observe that depending on the values of $\bar{\zeta}$ and I^B, the tax in equation (10) can be either positive or negative. In particular, if $\mathrm{T}^A > 0$ then this means that the location-specific rent is shared between

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The weak inequality in (6) describes a threshold condition and this inequality is *not* a reaction function. In addition, there are *no* reaction functions in our analysis that are based on this inequality condition. Specifically, this condition tells us how large the average region-specific rent in A (the left-hand-side) has to be for our entrepreneur to establish her firm in region A. Given this explanation, it should be clear to the reader that it is *not* possible to present a graphical depiction of reaction functions based on the inequality condition in (6).

[12] As pointed out in section 2.1, our model in this note is static. Therefore, this model cannot address dynamic or intertemporal issues that might arise from, for instance, low business tax revenues in one time period being offset by high business tax revenues in a subsequent time period.

our entrepreneur and region A. On the other hand, if $\mathrm{T}^A < 0$ then the entrepreneur is successful in extracting a payoff that is in excess of the location-specific rent.

The above-described state of affairs with the two tax rates given in equations (9) and (10) will be an equilibrium as long as

$$I^A + \mathrm{T}^A \geq 0. \tag{11}$$

Using equation (10), the condition in (11) can be re-written as

$$I^A + \bar{\zeta} - I^B \geq 0. \tag{12}$$

Inspecting the inequality in (12),[13] it follows that our entrepreneur will locate in and establish her firm in region B as long as the condition

$$\bar{\zeta} < I^B - I^A \tag{13}$$

is satisfied.

The condition in (13) tells us that even though, relatively speaking, region B suffers from the absence of a location-specific rent, there exists a circumstance in which it can, in effect, annul the advantage that region A enjoys from its location-specific rent.

Although we have conducted our analysis of the nexuses between a region-specific rent and the efficacy of tax policy in attracting creative class members to a particular region through the lens of economics, we acknowledge that political considerations matter as well. We do not address these political considerations here because of two reasons. First, these considerations are beyond the scope of this note. Second, many of these considerations have been analyzed in some detail in a recent paper by Batabyal *et al*. (2019). That said, one way in which we could introduce

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We reiterate that our model is static. Therefore, as pointed out in the previous footnote, this model is unable to address intertemporal issues. Therefore, the question of our entrepreneur having "perfect foresight" is irrelevant in our model because perfect foresight is a pertinent issue only in an intertemporal setting. That said, we do assume that our entrepreneur understands the mathematical structure of the model described in section 2.1 and that she is also able to compute expectations.

political considerations and "political rationality" explicitly into the analysis would be to consider a dynamic model in which the tax in, for instance, region A depends on the income I^A and is also the outcome of majority voting in A. This completes our analysis of the use of taxes to attract the creative class in the presence of a region-specific rent.

3. Conclusions

In this note, we studied interregional competition between two regions A and B that used taxes T^A and T^B to draw in a representative creative class member (the entrepreneur). This entrepreneur established a firm in either region A or B and this action ensured her profit Π. However, if the entrepreneur located in region A then she also gained a probabilistic, location-specific rent that was either high or low in magnitude. In this setting, given values of the two tax rates, we determined the payoff to the entrepreneur in the two regions for the two possible values of the location-specific rent in A. Next, we ascertained when the entrepreneur would choose to locate in A for both values of the rent and when she would choose to locate in B. Finally, we calculated the tax rate that B would set and then we specified a condition that guaranteed the location of our entrepreneur in region B.

The analysis in this note can be extended 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 regions in an intertemporal setting in which one advantaged region loses its rent or one disadvantaged region gains rent over time. Second, it would be instructive to analyze the interaction between creative class members and appropriate authorities in several regions as a multi-player static or dynamic game. This would permit a researcher to work explicitly with best response or reaction functions to illustrate the working of one or more features of the underlying game-theoretic model. Finally, it would also be informative to analyze

the interactions between entrepreneurial creative class members and multiple regions when potentially high corporate tax rates deter entrepreneurs from locating in a particular region but agglomeration rents attract them to this same region. Studies that examine these facets of the underlying problem will provide further insights into the nature of the dealings between mobile members of the creative class and authorities that would like to attract such members to their respective regions.

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