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by

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Abstract

We analyze a stylized creative region's economy. There are two goods (consumption and creative capital) and creative class members *differ* in their income generating abilities. The distribution of abilities in the creative class population is such that the median ability is less than the average ability. There is a proportional income tax rate and all tax revenues are redistributed to the creative class members by the regional authority (RA) with a uniform, lump-sum transfer. In this setting, we perform four tasks. First, we determine the tax rate that maximizes the lump-sum transfer. Second, we show that income equality requires the tax rate to equal unity and that the poorest creative class member is better off with a lower tax rate and hence *more* inequality. Third, given the ith creative class member's preference over the tax rate and the transfer, we ascertain the tax rate that will be chosen by majority voting. Finally, we discuss the connection between increasing inequality and the majority chosen tax rate.

1. Introduction

1.1. Preliminaries

The academic and the popular writings of the urbanist Richard Florida[3] have familiarized both regional scientists and urban economists with the twin notions of the *creative class* and *creative capital*. In his well-known tome titled *The Rise of the Creative Class*, Florida (2002, p. 68) clarifies that the creative class "consists of people who add economic value through their creativity." This class is made up of professionals such as doctors, lawyers, scientists, engineers, university professors, and, markedly, bohemians such as artists, musicians, and sculptors. From the vantage point of urban and more generally regional economic growth and development, these people are noteworthy because they possess creative capital which is the "intrinsically human ability to create new ideas, new technologies, new business models, new cultural forms, and whole new industries that really [matter]" (Florida, 2005, p. 32).

The creative class is significant, says Florida, because this group of people gives rise to ideas, information, and technology, outputs that are important for the growth and development of cities and regions. Therefore, in this era of globalization, cities and regions that want to prosper need to do all they can to attract and retain members of this creative class because this class is the primary driver of economic growth.

As a result of the empirical research that has been conducted in the last two decades, not all researchers are on board with Florida about the seemingly virtuous impact of the creative class on cities and regions. Specifically, several researchers have pointed to the existence of one or more

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[3] See Florida (2002, 2005) and Florida *et al.* (2008).

kinds of inequality in regions where the creative class is a significant part of the overall workforce. Therefore, we now briefly review this literature about the nexuses between the creative class and economic inequality.

1.2. Literature review

Peck (2005) has pointed out that the use of creative strategies in creative cities has done little to ameliorate problems stemming from the existence of what he calls socio-spatial inequality. Donegan and Lowe (2008, p. 46) have vigorously put forth the view that creative class theory has a "dark side" to it because cities that have a larger creative talent pool are also likely to have greater income inequality. This point has also been emphasized by Reese and Sands (2008). The findings of these three studies notwithstanding, Arribas-Bel *et al.* (2015) note that social and ethnic diversity may act as an "attraction force" for visitors seeking to enjoy the vibrancy of inner city areas in a metropolis like Amsterdam.

Leslie and Catungal (2012) maintain that the pursuit of ideas stemming from Richard Florida's creative class theory by many municipal governments has not only deepened class inequality but that specific features of what they call the "creative city" have resulted in the continuance and even the exacerbation of class, gender, and racial inequalities. Siemiatycki (2013) focuses on Oshawa, Ontario and points out that policies designed to attract creative class workers to this "lagging region" have led to some achievements but that they have also given rise to growing concerns about poverty, homelessness, and inequality. Kane and Hipp (2019) study "superstar cities" that are characterized by the existence of the trinity of lucrative creative class jobs, venture capital, and innovation. They note that even though such cities are not necessarily more unequal, an overrepresentation of creative occupations precludes mixing in the different

neighborhoods.

In the theoretical literature, Batabyal and Nijkamp (2016) define an indicator of inequality and demonstrate that an increase in inequality enhances the efficiency with which a final good, that uses different creative capital units, is produced. Batabyal (2017) first divides the creative class in a region into artists and engineers. He then shows that under certain circumstances, it is possible for a regional authority (RA) to uniquely redistribute income between artists and engineers in a way that achieves the so called "golden rule" stock of physical capital. Finally, Batabyal and Beladi (2018) also split up the creative class into artists and engineers and then describe the optimal income redistribution rule that maximizes the creative class's average steady state income.

The studies described thus far in this subsection have certainly advanced our understanding of many facets of the nexuses between the activities of the creative class and aspects of regional economic inequality. Even so, to the best of our knowledge, there are *no theoretical* studies that have explicitly modeled the heterogeneity of the creative class and then analyzed the connections between tax policy and income inequality in a region that is creative in the sense of Richard Florida.[4]

1.3. Contributions of our paper

Given this lacuna in the literature, in our paper, we analyze a stylized creative region's economy. In this economy, there are two goods and these two goods are consumption and creative

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[4]

It should be noted that in his 2018 book titled *The New Urban Crisis*, Florida agrees that the influx of the creative class into cities has often given rise to economic inequality and, as such, he suggests some ways in which this inequality problem might be addressed. See Batabyal (2018) for a critical review of this book.

capital. Members of the creative class differ in their income generating abilities. The distribution of abilities in the creative class population is such that the median ability level is less than the mean ability level. There is a proportional income tax rate and all tax revenues are redistributed to the creative class members by the RA with a uniform, lump-sum transfer. Section 2 presents the theoretical framework. Section 3 determines the tax rate that maximizes the lump-sum transfer. Section 4 shows that income equality necessitates that the tax rate equal unity and that the poorest creative class member is better off with a lower tax rate and hence *more* inequality. Given the ith creative class member's preference over the tax rate and the transfer, section 5 ascertains the tax rate that will be chosen by majority voting. Section 6 discusses the connection between increasing inequality and the majority chosen tax rate. Section 7 concludes and then discusses two ways in which the research described in this paper might be extended.

2. The Theoretical Framework

Consider the economy of a stylized region that is creative in the sense of Richard Florida. In other words, we are thinking of a geographical area in which the creative class is a significant component of the total workforce, it contributes in a noteworthy manner to the overall economy, and therefore it makes sense to concentrate specifically on this creative class. Given this line of thinking, there are two possible interpretations of our creative region. In the first interpretation, our creative region represents, in a formalized manner, cities like San Francisco, Portland, and Denver. This is because in each of these three cities, the creative class makes up more than 45 percent of the total workforce[5] and the cities themselves are permitted by the states in which they

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[5]

Go to https://www.bloomberg.com/news/articles/2019-08-27/the-changing-geography-of-america-s-creative-class for a more detailed corroboration of this claim. Accessed on 7 April 2021.

lie (California, Oregon, and Colorado) to have some authority in the setting of income taxes.[6] In the second interpretation, our stylized region represents states like California, New York, and Massachusetts, where large numbers of creative class workers reside and where these states obviously have the ability to set state income taxes. The reader should note that irrespective of which interpretation one adopts, we are *not* assuming that our stylized region is closed. In fact, individual creative class members are free to move either within our stylized region or even leave this region. In either contingency, our subsequent analysis in sections 3 through 6 is essentially unaffected because the various tax setting and voting activities we study occur at a *point* in time and at the *end* of the time period of interest (see footnote 5 below).

There are two goods in our stylized region and these two goods are consumption and creative capital.[7] The members of the creative class are *heterogeneous* in the sense that they differ in their income generating ability denoted by $\alpha_i > 0$. As discussed in section 1.1, artists and doctors both make up the creative class and hence our analysis *allows* for the realistic possibility that an artist's income generating ability is less than that of a doctor's. In fact, our analysis also *allows* for the possibility that within the category of artists, one kind, for instance billboard painters, has an ability to generate income that is lower than that possessed by another kind, namely, Hollywood actors. We suppose that the distribution of these abilities is characterized by the fact that the median ability level α_m is less than the average or mean ability level α_a.[8]

The income level of each member of the creative class is given by

$$I_i = (1 - \tau)\alpha_i, \tag{1}$$

where $\tau \in [0, 1]$ is the proportional income tax rate. Finally, we suppose that the accumulated tax revenues are redistributed by the RA[9] to the creative class members with a uniform, lump-sum transfer $g > 0$. With this description of the theoretical framework out of the way, our next task is to determine the tax rate that maximizes the lump-sum transfer.

3. Maximizing the Lump-Sum Transfer

The income level of a creative class member with income generating ability α_i is given by equation (1). The RA's budget balance condition is given by

$$g = \tau I_a, \tag{2}$$

where I_a is the average creative class member income. In words, equation (2) tells us that the RA's expenditure or the lump-sum transfer g must equal the tax revenue which equals τI_a. Now, to compute the average income I_a, we use the expectation operator $E(\cdot)$ and write

$$I_a = E(I_i) = (1 - \tau)E(\alpha_i) = (1 - \tau)\alpha_a. \tag{3}$$

When the median is less than the mean this tells us that the probability distribution function of interest is positively skewed or, put differently, that there are outliers in the high end of the distribution. When it comes to the study of income distributions, there is a lot of empirical evidence---see Chiripanhura (2011)---which shows that such distributions are frequently characterized by the presence of a large number of poor and middle-class households with a small number of very wealthy households. In other words, the median household income is typically *less* than the mean household income. The $\alpha_i's$ in our model refer to the *income* generating ability of the individual creative class members. Therefore, given the prior empirical evidence, we contend that it makes sense to think of the distribution of these income generating abilities in a way so that the median ability level is less than the mean ability level.

[9]

Given the two possible interpretations of our stylized region stated in the first paragraph of this section, the RA can be thought of as either the Mayor of a city like San Francisco or as the Governor of a state such as California. That said, for the purpose of our analysis in this paper, it is understood that a Mayor makes decisions with his or her city council and that a Governor makes decisions in consultation with the state legislature.

Using equations (2) and (3), we can express the lump-sum transfer as

$$g = \tau(1 - \tau)\alpha_a. \tag{4}$$

Note that the lump-sum transfer g is a concave function of the tax rate τ because $d^2g/d\tau^2 = -2\alpha_a < 0$. Maximizing the lump-sum transfer in equation (4) with respect to the tax rate τ gives us the first-order necessary and sufficient condition

$$\alpha_a(1 - 2\tau) = 0 \Rightarrow \tau = \frac{1}{2}. \tag{5}$$

So, the tax rate that maximizes the lump-sum transfer equals one-half. In other words, if the RA would like to get the most out of the amount of revenue that it redistributes to the various members of the creative class then it ought to levy a 50 percent tax on their income. We now analyze what a stipulation of income *equality* means for the poorest member of the creative class.

4. Implications of Income Equality

We begin by noting that the after-tax income of a creative class member with income generating ability α_i is given by

$$I_{a\tau} = g + (1 - \tau)I_i. \tag{6}$$

Substituting for g from equation (2) in the right-hand-side (RHS) of equation (6) gives us

$$I_{a\tau} = I_a + (1 - \tau)(I_i - I_a). \tag{7}$$

Inspecting equation (7), it is straightforward to confirm that in order to *equalize* the after-tax incomes of the creative class members, we must have

$$\tau = 1 \implies I_{a\tau} = I_a. \tag{8}$$

But if we must have $\tau = 1$ then we also obtain the result that

$$I_a = E(I_i) = (1 - \tau)\alpha_a = 0. \tag{9}$$

This finding and equations (2) and (6) together tell us that the *poorest* creative class member with income $I_i = 0$ receives after-tax income $I_{a\tau} = 0$.

We now claim that this poorest creative class member would be better off with a *lower* tax rate $\tau < 1$. To confirm this claim, observe that when $\tau < 1$, the poorest creative class member's after-tax income is

$$I_{a\tau} = I_a + (1 - \tau)(0 - I_a) = \tau I_a = \tau(1 - \tau)\alpha_a > 0. \tag{10}$$

It is straightforward to verify that the after-tax income of the poorest member of the creative class is maximized when the tax rate $\tau = 1/2$. What we have just shown is that whereas income *equality* in our creative region requires $\tau = 1$, the poorest creative class member is actually *better off* with a lower tax rate. Put differently and somewhat counterintuitively, the poorest creative class member is better off with *more* inequality. Now, given the ith creative class member's preference over the tax rate τ and the transfer g, let us ascertain the tax rate that will be chosen by majority voting[10] in our creative region.

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[10]

We concentrate on majority voting because this is one of the most common voting systems in democracies. That said, although voters do not, as a rule, determine tax rates directly, in elections at the state and sub-state levels, there is a connection between taxes and voting. Go to https://vhd.overseasvotefoundation.org/index.php?/ovf/Knowledgebase/Article/View/512/10/is-there-a-link-

5. Majority Voting and the Tax Rate

Let us denote the *ith* creative class member's preference over the tax rate τ and the lump-sum transfer g by the function

$$U_i = g + \frac{1}{2}\alpha_i(1-\tau)^2. \tag{11}$$

Now observe that the creative class member whose income generating ability equals the median ability level is the *decisive* voter in our model. So, in order to apply the median voter theorem[11] to our problem, the indifference curves corresponding to the preference function in equation (1) in (τ, g) space must satisfy the so called single crossing property.[12] When this last property holds, the marginal rates of substitution between the tax rate τ and the lump-sum transfer g among the different creative class members can be ranked *independently* of the tax policy adopted by the RA.

Now, let $s_i(\tau, g)$ denote the *ith* creative class member's marginal rate of substitution between τ and g. Then, totally differentiating equation (11), we get

$$s_i(\tau, g) = I_i = (1-\tau)\alpha_i. \tag{12}$$

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between-voting-and-taxes for additional details on this point. In addition, through ballot initiatives, voters often do vote directly on a variety of issues including taxes. For instance, in the 2020 election in the United States, voters in 17 states had a direct say on a variety of taxes. See https://www.kiplinger.com/taxes/state-tax/601555/election-2020-states-with-tax-questions-on-the-ballot for a more detailed corroboration of this point. Both sites accessed on 8 April 2021.

[11] See Hindriks and Myles (2013, pp. 157-159) for a textbook exposition of the median voter theorem.

[12] See Hindriks and Myles (2013, p. 354) for a textbook discussion of the single crossing property.

Inspecting equation (12), it is straightforward to verify that the marginal rate of substitution under study is monotonically increasing in the income generating ability α_i for any tax-transfer policy (τ, g). Hence, the single crossing property is satisfied and there exists a "majority winning" tax rate that is described by the median voter theorem. Put differently, the "majority winner" maximizes the preference function of the median creative class member.

Substituting the budget balance constraint from equation (4) into the preference function---see equation (11)---of the median creative class member (voter), we get

$$U_m = \tau(1-\tau)\alpha_a + \frac{1}{2}a_m(1-\tau)^2. \tag{13}$$

Maximizing the median creative class member's utility in equation (13) with respect to the tax rate τ and then simplifying the resulting equation gives us a closed-form expression for the preferred tax rate. That expression is

$$\tau_m = \frac{\alpha_a - \alpha_m}{2\alpha_a - \alpha_m}. \tag{14}$$

Equation (14) gives us the tax rate that will be chosen as a result of majority voting in our creative region.

Instead of voting for a tax rate in our stylized region, in principle, a creative class member may choose, *a la* Tiebout (1956), to vote with his or her feet and move to a different region. Such an action would reduce the *size* of the creative class in our region. That said, it is important to grasp the following two points. First, the size of the creative class in our region does *not* materially affect the analysis we undertake in this paper. To see this, consider what would happen if the poorest creative class member, for instance, were to leave our stylized region. In this case, the individual who was previously the second poorest in our region would now become the poorest. Other than this change, nothing else in our theoretical analysis would be altered. Second, as explained in the first paragraph of section 2, because the various tax setting and voting activities we study here occur at a *point* in time and at the *end* of the time period of interest, a change in the size of the creative class would, once again, not affect our theoretical analysis substantively. We now proceed to our final task in this paper and that is to discuss the connection between increasing inequality and the majority chosen tax rate in equation (14). [13]

6. Increasing Inequality and the Majority Chosen Tax Rate

Inspecting equation (14), it is clear that the median voter's preferred tax rate is *increasing* in the *difference* between the mean and the median income generating abilities $(\alpha_a - \alpha_m) > 0$. Since this positive difference can be interpreted as a measure of income inequality in our creative region, we see that increasing (decreasing) income inequality raises (lowers) the majority chosen tax rate. If we treat the magnitude of the tax rate as a proxy for the size of the public sector in our creative region then we can also say that an increase (decrease) in income inequality expands

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[13]

We acknowledge that voters care not only about the tax rate but also about "the group benefits that emerge from the RA's spending of the tax money." That said, the reader should note that we have already modeled this point in equation (11) and by specifying in section 2 that the RA redistributes the tax revenues to the creative class members with a uniform, lump-sum transfer $g > 0$. In fact, we think the above point is an important one and that is why section 3 is devoted to determining how to maximize this lump-sum transfer.

(contracts) the size of the public sector. This completes our study of aspects of income inequality in a creative region.

7. Conclusions

In this paper, we analyzed the economy of a stylized creative region. There were two goods in this economy---consumption and creative capital---and creative class members differed in their income generating abilities. The distribution of abilities in the creative class population was such that the median ability level was less than the average ability level. There was a proportional income tax rate and all tax revenues were redistributed to the creative class members by the RA with a uniform, lump-sum transfer. In this setting, we first determined the tax rate that maximized the lump-sum transfer. Second, we showed that income equality required that the tax rate equal unity and that the poorest creative class member was better off with a lower tax rate and thus *greater* inequality. Third, given the ith creative class member's preference over the tax rate and the transfer, we ascertained the tax rate that would be chosen by majority voting. Finally, we commented on the link between increasing income inequality and the majority chosen tax rate.

The analysis in this paper can be extended in a number of different directions. Here are two potential extensions. First, it would be interesting to model the interaction between a RA and creative class members in a discrete-time, multi-period setting, and to then analyze the ways in which dynamic tax policy affects income inequality over time. Second and once again in a discrete-time, multi-period setting, it would be useful to endogenize the heterogeneous income generating abilities by allowing these abilities in, for instance, time period t to change as a response to the tax rate in time period $t-1$. Studies that analyze these aspects of the underlying problem will provide

additional insights into the nature of the static and the dynamic fiscal interactions between creative

class members and regional authorities.

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