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Artists, engineers, and aspects of economic growth in a creative region

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ABSTRACT

We study aspects of economic growth in a region that is creative *a la* Richard Florida. Members of the creative class possess creative capital and they fall into one of two possible groups—they are either *artists* or *engineers*. We describe the optimal income redistribution rule that maximizes the creative class's average steady state income. Because this average income is increasing in the physical capital per creative class member ratio, the rule requires a regional authority to redistribute income away from (towards) the group that saves a lower (higher) fraction of its income. This is a negative finding in the sense that the rule's implementation will tend to favor the group that already saves more. Even so, the finding is consistent with the observation made by some researchers that there is a connection between income inequality and regions in which the creative class performs a large part of all economic activities.

1. Introduction

The academic and the general writings of the urbanist Richard Florida in the last two decades have resulted in the popularization of the twin concepts of the *creative class* and *creative capital* among economists. As pointed out by Florida (2002, p. 68), the creative class "consists of people who add economic value through their creativity." This class consists of professionals such as doctors, engineers, lawyers, scientists, university professors, and, notably, bohemians such as artists, musicians, and sculptors. The distinguishing feature of these people is that they possess creative capital which is defined to be 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).

Florida (2014) contends that a student of regional economic growth ought to focus substantively on the activities of the creative class because the group of people comprising this class gives rise to ideas, information, and technology, outputs that are significant for the growth of cities and regions. Therefore, cities and regions that want to prosper in this era of globalization need to do all they can to attract and retain members of this creative class who are, for all practical purposes, the primary drivers of economic growth.

Is there any difference between the well-known concept of human capital and Florida's newer notion of creative capital?[1] To answer this question, first observe that in empirical work, the notion of human capital is generally measured with education or with education based indicators. This notwithstanding, Marlet and Van Woerkens (2007) have rightly pointed out that the accumulation of creative capital does *not* always depend on the acquisition of a formal education. In other words, while the creative capital accumulated by some members of Florida's creative class (doctors, engineers, university professors) does depend on the completion of many years of formal education, the same is not always true of other members of this creative class (artists, painters, poets). Individuals in this latter group may be innately creative and hence possess creative capital despite having very little or no formal education. Having said this, we acknowledge that it is certainly possible for individuals who are innately creative to augment their creative capital with continuous experimentation, learning by doing, and through the application of knowledge acquired via practical experiences. When looked at in this way, at any given point in time, the creative capital possessed by innately creative individuals is, at least in part, the outcome of the accumulation of professional and business experiences. To conclude this line of thinking, note that the distinction we are making between the two kinds of creative capital depends largely on whether this creative capital is or is not the outcome of schooling related as opposed to non-schooling related factors.

To link the discussion in the preceding paragraph with the previously cited paper by Marlet and Van Woerkens (2007), we agree with these

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[1] The accumulation and the impacts of human capital have been thoroughly studied by economists from both theoretical and empirical perspectives. See Voyvoda and Yeldan (2015), Benos and Karagiannis (2016), Bengoa et al. (2017), and the many references in these studies for a more detailed corroboration of this claim.

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researchers and note that there is little or no difference between the notions of human and creative capital when the accumulation of this creative capital depends on the completion of many years of formal education. In contrast, there can be a lot of difference between the notions of human and creative capital when the accumulation of this creative capital depends on the accumulation of professional and business experiences but *not* on the completion of a formal education. Because creative capital is of two types, it is a *more general* concept than the primarily schooling based notion of human capital.[2]

A review of the contemporary literature on the creative capital possessing creative class yields two straightforward conclusions. First, there exist many studies on the composition and the effects of the creative class in different regions. However, these studies typically are either empirical in nature or based on case studies.[3] Second, a smaller set of studies has focused on the connections between the creative class in a region and economic growth in this same region but these studies also are empirical in nature.

For instance, Boschma and Fritsch (2009) utilize a data set that covers more than 500 regions in seven European countries and demonstrate that there is some evidence of a positive relationship among creative class occupations, employment growth, and entrepreneurship at the regional level. Marrocu and Paci (2012) concentrate on 257 regions in the European Union and show that highly educated people working in creative occupations are the most relevant component in explaining production efficiency and that the so called bohemians have little impact on a region's economic performance. Finally, Kerimoglu and Karahasan (2014) focus on Spain and point out that the notion of creative capital and specifically its local spillover have a salient impact on regional income gaps in Spain once other factors such as human and physical capital accumulation have been controlled for.

An important point is now worth emphasizing. Although there exist many empirical or case study based analyses of the creative class and the impact that this class has on regional economic growth, there are *no* theoretical studies of the creative class that explicitly model the fact that the creative capital possessed by the members of a region's creative class is of *two possible types*. Given this lacuna in the literature, our objective in this paper is to provide the *first theoretical* or *modeling oriented* analysis of economic growth in a region that is creative in the sense of Richard Florida and where members of the creative class belong to one of two possible groups. Consistent with the previously discussed work of Marlet and Van Woerkens (2007), this two-part grouping arises because the creative capital possessed by the individual members is of two possible types.

The remainder of this paper is organized as follows. Section 2 delineates our model of a creative region. Section 3 derives the wage of members in each of the two creative class groups. Section 4 shows that the average wage in the creative region being studied is increasing in the physical capital per creative class member ratio. Section 5 derives an expression for the steady state physical capital per creative class member ratio. Section 6 shows that in a particular circumstance, the distribution of income does not affect the steady state physical capital per creative class member ratio. Section 7 first derives and then describes the optimal income redistribution rule that maximizes the average steady state income of the creative class. Section 8 concludes and then suggests two ways in which the research described in this paper might be extended.[4]

2. The theoretical framework

Consider a dynamic regional economy that is creative *a la* Richard Florida. Time is discrete. Let N_t denote the number of individuals at time t who comprise the creative class in this region. Since all the members of the creative class are employed at all points in time, we can also think of N_t as the total number of workers in our creative region. Every worker in our creative region is a member of the creative class and there are two groups of workers. Without any loss of generality, we shall broadly refer to members of the creative class who are innately creative and hence possess creative capital with little or no formal schooling as *artists*.[5] At any time t, the total number of artists in our creative region is denoted by N_t^A. Similarly, we shall generically refer to the creative class members who are creative as a result of the acquisition of creative capital through many years of formal schooling as *engineers*. Let N_t^E denote the total number of engineers at time t in our creative region. With this specification in place, the reader should note that the relationship

$$N_t = N_t^A + N_t^E, \ \forall t, \tag{1}$$

holds in our creative region.

Each member of the creative class or worker inelastically supplies one unit of effort. As a result, at any time t, every artist receives a wage or unit income denoted by w_t^A and every engineer receives a wage denoted by w_t^E. Using these two pieces of information and equation (1), we can write

$$N_t w_t = N_t^A w_t^A + N_t^E w_t^E, \ \forall t, \tag{2}$$

for the economy of our creative region as a whole. The w_t in the left-hand-side (LHS) of equation (2) should be thought of as the average wage of the members of the creative class. Let us denote the wage or unit income ratio in our creative region by $w_t^A/w_t^E = \phi$ where $\phi \in (0, \infty)$ and we can think of ϕ as an income distribution parameter in our creative region. The fraction of artists in the creative class population is assumed to be $\zeta \in (0, 1)$ and therefore the fraction of engineers in this same population is $(1 - \zeta)$. The creative class population grows at a constant rate denoted by $c > 0$[6].

The members of the creative class collectively produce a knowledge good such as a smartphone or a laptop computer and this knowledge good is also the final consumption good. The price of this knowledge good is normalized to unity at all points in time. The output of this knowledge good per creative class member at time t is denoted by $q_t = Q_t/N_t$ and this output is generated by a Cobb-Douglas production function which, in its so called intensive form, can be expressed as[7]

$$q_t = f(k_t) = k_t^\alpha, \tag{3}$$

where the parameter $\alpha \in (0, 1)$ and $k_t = K_t/N_t$ is the physical capital per creative class member ratio. There are constant returns to scale in production and we suppose that the equilibrium wage and the interest rate (r_t) are set equal to the respective marginal productivities.

The savings rates of the artists and the engineers are constants denoted by λ^A and λ^E respectively. In what follows, without loss of gen-

[2] Our discussion of the two types of creative capital including the notion of innate creativity is not without precedent. Recently, Usman and Batabyal (2014), Batabyal and Beladi (2016a, 2016b), and Batabyal and Nijkamp (2016) have also commented on the two types of creative capital in their research.

[3] See Donegan and Lowe (2008), Florida et al. (2008), Reese and Sands (2008), Lorenz (2011), Liu and Xie (2013), Siemiatycki (2013), and Arribas-Bel et al. (2016) for a more detailed corroboration of this claim.

[4] It is important to understand that the following Section 2 delineation of our theoretical model contains all the detail that is necessary to conduct the various tasks to be undertaken in Sections 3 through 7 of the paper.

[5] Recall from the Section 1 discussion that the creative capital possessed by artists may, at least in part, be the outcome of the accumulation of professional and business experiences.

[6] Issues related to the distribution of income in our creative region are discussed in greater detail in Sections 3 and 7 below.

[7] We are not the first to use a Cobb-Douglas function to model production in a region that is populated by members of the so called creative class. Specifically, Batabyal and Beladi (2015), Buettner and Janeba (2016), and Porter and Batabyal (2016) have all used this function in their analyses of regional economies with a noteworthy presence of the creative class. This notwithstanding, it is of some interest to determine how the analysis conducted in this paper is impacted when we dispense with this Cobb-Douglas production function and use a different production function with an explicit "technology parameter." This task is undertaken in the Appendix to this paper.