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ENTREPRENEURIAL CULTURE, OCCUPATIONAL CHOICE AND TAX POLICY

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Abstract

This paper studies the influence of entrepreneurial culture among social groups in an economy. The cultural factor determines their occupational preferences. We develop a model in which a concentration factor has been used as a measure of business culture determining the occupational choice patterns of otherwise identical social groups. The occupational distribution of individuals from different groups is obtained by comparing expected utilities from employment and entrepreneurship. Based on the labor market outcomes the mean income and income variance of different groups is calculated. Individuals from groups with greater cultural traits display higher relative risk aversion with a high income variance compared to other groups. We propose a tax- subsidy policy and obtain conditions for maximizing social utility.

JEL Classification: D81, J23, H24.

Keywords: Entrepreneurial culture, Self-employment, Risk aversion, Income variance, National Income, Tax-subsidy Policy

1. Introduction

The concept of culture is not only very wide, but it also lends itself to substantial complexity to various forms of social and economic institutions. The vastness embedded in understanding what is meant by culture leads to a belief that it is a nebulous concept. This is one of the reasons why culture has been denied its due place in most economic analyses of individual or group behavior. Economic models, in particular, avoid the inclusion of cultural factors in explaining market behaviors or responses on the ground that culture itself is very imprecise. However, generally speaking, a non-quantifiable exogenous factor often posits significant explanatory power behind a host of economic and social phenomena. In many related work, such 'residual element' has been recognized as a 'cultural factor' (for example, Landes, 1998) and has also been quite useful for comparing differential growth patterns among countries or for regions within a country.

Difficulties nevertheless remain in incorporating culture into any analysis based on 'methodological individualism' (Godley, 2001, p.3). To quote Godley (2001, p. 3), "How can culture be specified when it is yet to be satisfactorily defined? How can it be quantified if it remains vague and unclassified?" Nevertheless, there exists some effort in the literature to draw the links between culture and economic growth.[1] The present study, on the other hand, uses culture as an important factor in individual decision-making. Individuals choose their occupational types based on their cultural backgrounds. In fact, there are a number of cultural factors (racial beliefs, religious

[1] See for example, Leibenstein (1978), Casson (1991), Casson and Godley (2000).

customs etc.) that affect an individual's decision. We, however, focus only on an individual's degree of 'business orientation' as a cultural trait derived from her affiliation to a respective economic group. Essentially, this study has two distinct purposes. First, we determine the distribution of workers and self-employed individuals across economic groups with varying degrees of business orientations. Second, we propose a tax policy, which maximizes social utility and additionally, reduces inter-group income disparity.

The parallel literature to which we refer shortly, have made allusions to cultural (racial) factors as influencing individualistic behaviors. The principal motivation behind this paper is introducing a cultural dimension in models of economic decision-making at a much more generalized level. Moreover, historically speaking, individuals in many countries were identified in terms of their family businesses, which in most cases took the form of low-level self-employment activities. The butchers, the brewers, the carpenters, or the usurers have successfully maintained their family or, in a more aggregative sense, community businesses for ages. We argue that although the initial characteristics associated with respective professions have been significantly transformed, the initial conditions could still influence the choice of occupation in a modern labor market. However, for relating directly to this phenomenon, we restrict our attention to an analysis of group behavior (as against individual-specific behavior) influenced by the cultural legacies.

The rest of the paper is structured as follows. We present a brief introduction to the relevant literature in section 2 and a model in section 3. We propose a tax-subsidy

policy in section 4, where the purpose is maximizing a social utility function. Section 5 concludes.

2. Entrepreneurial Culture

One snapshot of the late Victorian economic history of Britain shall be quite useful as a first step towards identifying economic groups within a country and the mutual attitude that they held against each other. The entrepreneurial decline in Britain during this period has been considered the single most controversial episode on the relationship between economic behavior and culture. Britain's entrepreneurs during this period allegedly nurtured anti-industrial cultural values. There is some consensus that Britain's industrial experience at the turn of the century was dominated by 'intellectual stalemate' (Kirby, 1992).

A similar phenomenon was observed in a number of other countries. Notably, in post-independence (1947) India, radical changes were observed in the shifting of industrial bases within the country. Between 1914 -22, for example, the eastern part with its base in Calcutta harnessed the largest increase in capital investments from European, mixed or purely Indian investors. Towards the end of the first half of the 20th century, the transfer of power from British government to the Government of India lead many existing European firms to move their businesses back overseas. Alternatively, they sold off their investments and transferred money overseas. The void in the eastern region was quickly filled by businessmen migrating to this region from other parts of the country (mostly, Marwaris from Rajasthan, a western province of India). Gupta (1991) explains in detail why the industrial power in the region shifted away from the

local entrepreneurs to those migrating from other regions. Indigenous peoples' notion of occupation types at the time was the following, " business is bad, that the guy running around in a Mercedes-Benz is unquestionably evil." (Gupta, 1991, p 107). On the other hand, internally migrating minority[2] entrepreneurs from other regions revealed in an interview conducted by Gupta (1991), that, they have strong desire to participate in business activities and outshine others. This value-centric attitude towards economic decision-making can be extensive and entrenched into a whole community over a sustained period of time. Gupta (1991) seeks to find if this attitude led to an era of industrial decay in this region. One of the reasons he cites is that, while this region of India, especially the province of West Bengal idealized the intellectual life, other parts of India held up other career goals. It is generally believed that, there is a lot of family education in Marwari and Gujarati families (indigenous of two western provinces of India) in developing entrepreneurship skills. On the other hand, natives of the eastern region promote educational achievements and working class bourgeoisie culture.

The present study invokes culture as a dominating factor behind choice of occupation. However, most studies on the choice of occupation among individuals have so far been based on, *(1) differing individual abilities* (Lucas, 1978; Calvo and Wellisz, 1980; Jovanovic, 1982; Brock and Evans, 1986), *(2) differing degrees of risk aversion* (Kihlstrom and Laffont, 1979; Kanbur, 1979, JPE, 1989, Boadway et al., 1991,

[2] In terms of their native language, say Gujarati, and their cultural distance from locally prevalent mass culture. Note, cultural specifications here, are limited to mass culture and we ignore outliers or different cultural enclaves within the mass culture.

Newman, 1995),[3] (3) *capital market imperfections and liquidity constraints* (Evans and Jovanovic, 1989; Banerjee and Newman, 1993; Boadway, 1998; Ghatak and Jiang, 2002, etc.).

Essentially, a simple definition of culture would be 'shared values and beliefs' (Casson & Godley, 2000, p.2). This definition allows sufficient maneuvering within the social sciences in general. It fits equally well with the subjectivism that underlies the economic theory of rational choice. We build up a model in which a risk-averse individual compares his/her utility in alternative occupations of risky self-employment[4] and risk free employment and chooses the one that yields a greater utility. This, however, is based on her position within the mass of population (normalized to 1 and classified by group types) uniformly distributed over a scale of relative risk aversion. Thus, the group's position, rather than an individual's position is a much more dominating factor in this analysis and the distribution of individuals by groups have been caused by historical or natural selection or may well have been caused by accident. Therefore, an important element of this analysis is that an individual's cultural (or group) identity matters (not individual abilities or individual risk aversion) in the *ex-ante* occupational choice. Stated alternatively, we investigate if occupational choice of an individual could be an outcome of her cohesiveness to a particular economic/social group, when information on particular economic incentives do not ordinarily flow

[3] Some other studies consider identically risk- averse individuals: examples being Appelbaum and Katz, 1986, Rees and Shah, 1986, Kar, 2004, etc.

[4] Self-employment can be defined in a number of ways. Knight (1921), Schumpeter (1934), Kirzner (1973), Lucas (1978), and Casson (1982) among others have defined entrepreneurship. For the theoretical model we develop in our study, an entrepreneur or a self- employed individual is a hybrid of all possible definitions.

across groups. The source of asymmetry here, is therefore, the existence of group-specific information that other groups do not ordinarily have access to.

This cultural or ethnic trait also significantly explains entrepreneurial patterns in other countries, although the racial characteristics dominate the group formation. Hout and Rosen (2000) notably, find that among blacks and Hispanics in the US, propensity to move into business ventures is lower than whites and Asians.[5] Other than that, Bates (1995, 1997), Fairlie (1996) find that lower levels of assets, lower probabilities of having a self-employed father and less past experience in self-employment largely explain low entrepreneurial participation by blacks.[6]

Further, with respect to immigrants operating businesses in the USA and other industrialized countries, a cultural factor seems to be in operation. Bonacich and Modell (1981) emphasized the presence of 'thrift and co-operation' (p.45) based on cultural and racial characteristics among Japanese immigrants in the US during the pre-World War II era, in largely facilitating their business ventures.[7] In similar studies (Bates, 1997; Borjas, 1987, LaLonde and Topel, 1992; Funkhouser and Trejo, 1995; Yuengert, 1995; Light, 1985; Duleep and Regets, 1997), the notion of cultural traits observed at the source of immigration is used as crucial information in understanding

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[5] Even having self-employed fathers do not push sufficient number of black Americans into self-employment. (Hout and Rosen, 2000). Many black households are dominated by self-employed mothers, which do not affect favorably the choice of self-employment by men (Holtz-Eakin et al., 1996).

[6] We use these empirical observations to capture intra-family features as a cultural element in our model.

[7] Among many other immigrant groups, Korean-American men and women (with similar cultural background as Japanese) have self-employment rates of 27.9 and 18.9 percent, respectively (Fairlie, 1996). Other groups with varying cultural backgrounds but having high business representations are Sweedish, Greeks, Lebanese, etc. Besides, Chinese enclaves form a very special type of business set-up. (Godley, 2001).

the choice of occupation. According to this view, entrepreneurial behavior of immigrants is molded in the country of origin or by their cultural background.[8]

In the model we present next, occupational preferences facing all equally risk-averse individuals (distributed uniformly over the population) are limited to employment and self-employment. While employment means working for a firm or an individual at a given wage rate (wage is exogenous in our model), entrepreneurship/ self employment refers to "individuals those earn no wage or salary, but derive their income by exercising their profession or business on their own account and/or for their own risk" (De Wit, 1993, p. 2).

3. The Model

There are two groups of natives in a country, *A* and *B*. The total population of the country is unity. The number of individuals belonging to group *A* is α_A, while those in group *B* is α_B, such that $\alpha_A+\alpha_B=1$.[9] The labor market product of all individuals is *x* and the worker receives a return equivalent to her product. Individuals are not differentiated according to skill types.[10] Let π_A be the proportion of individuals in group A who are employed (as opposed to being self-employed) in equilibrium. Therefore, the actual number of group *A* individuals who are employed is calculated as, $\alpha_A\pi_A^*$, where π_A^* is the equilibrium value of π_A.

[8] Yuengert (1995) estimates a two-sector model of immigrant earnings. It supports that immigrants from countries with larger self-employment sectors display higher self-employment rates in the host country.

[9] We assume that α is exogenously determined.

[10] Introducing skill heterogeneity would complicate the model without providing any additional inferences to our ends.

Now, if an individual chooses self-employment, there is a fixed premium δ over his/her product in the labor market.[11] Other than that, let ε be a random return from self-employment. We assume a uniform distribution for ε, $g(\varepsilon)$, for $\varepsilon \in [-z, z]$. Looked at alternatively, $x + \delta$ is the mean return to the self-employed, as against x earned by individuals who instead choose employment.

Any such individuals who choose to be self-employed in equilibrium (within or outside special groups) face a constant relative risk aversion utility function, $U=(x+\delta+\varepsilon)^{1-r}$. In our model, '$r$' is the degree of relative risk aversion of an individual. Individuals have a von Neumann-Morgenstern utility function characterized by a measure of relative risk aversion *'r'* as under Arrow-Pratt (1965) and $r \in [0,1]$. Further, individuals are distributed uniformly over a scale of relative risk aversion, which implies that r follows a uniform density function. Let r^* be the level of relative risk aversion at which an individual is indifferent between employment and self-employment. This characterizes the marginal individual who is indifferent between employment and self-employment, as long as the expected utility from self-employment is equal to the market-clearing wage, x. Thus, individuals with $r>r^*$ choose employment, while those with $r<r^*$ choose self-employment.[12] Accordingly, the equilibrium value of π is determined once r^* is determined. Since the population is uniformly distributed over relative risk aversion, $\pi^* = 1 - r^*$. This solves for the

[11] It may be argued that presence of $'\delta'$ would push all individuals to self-employment, as there is a positive return from self-employment under all states. However, if $'\delta'$ is interpreted as the psychological return from autonomy, dominance etc. (see Lazear and Moore, 1984; Sexton and Bowman, 1985, p. 131), then the existence of $'\delta'$ can be a feature among a group of risk-averse individuals.

[12] This renders the present approach different from other models of self-selection in the labor market. The equilibrium is independent of distribution of individuals' abilities or degree of risk aversion.

equilibrium level of employment (conversely, self-employment) for individuals, subsequently.

While the above discussion pertains to the behavior of an individual, the point in focus is how the affiliation to a special group influences her choices. This engenders classification of the groups according to the special attributes.

Let us begin with group *A* individuals, who do not have the special characteristics – the business orientation. The utility function for self-employed individuals in group *A* is given by,

$$U = (x + \delta + \varepsilon)^{1-r_A} \tag{1}$$

The expected utility ($EUSE_A$) from self-employment when $g(\varepsilon)$ follows a uniform distribution, is

$$EUSE = \frac{1}{2z}\int_{-Z}^{Z}(x + \delta + \varepsilon)^{1-r_A}\, d\varepsilon \tag{2}$$

It follows that the lower the degree of marginal relative risk aversion, the higher the expected utility from self-employment, $\frac{\delta(EUSE)}{\delta r_A} < 0$

On the other hand, the utility from employment is given by,

$$U(x) = x \tag{3}$$

Comparing the expected utilities from (3) and (4) solves for r_A^* [point *M* in Fig (1)]. For group *A* it shows that all individuals distributed with a relative risk aversion greater than the critical rate, ($r^* > r_A^*$), would be employed, whereas those with $r^* < r_A^*$ would be self-employed in equilibrium.

Thus within group A, $\pi_A^* = 1 - r_A^*$ are employed in equilibrium, such that the actual number of employed is $\alpha_A^* = \alpha_A \pi_A^*$.

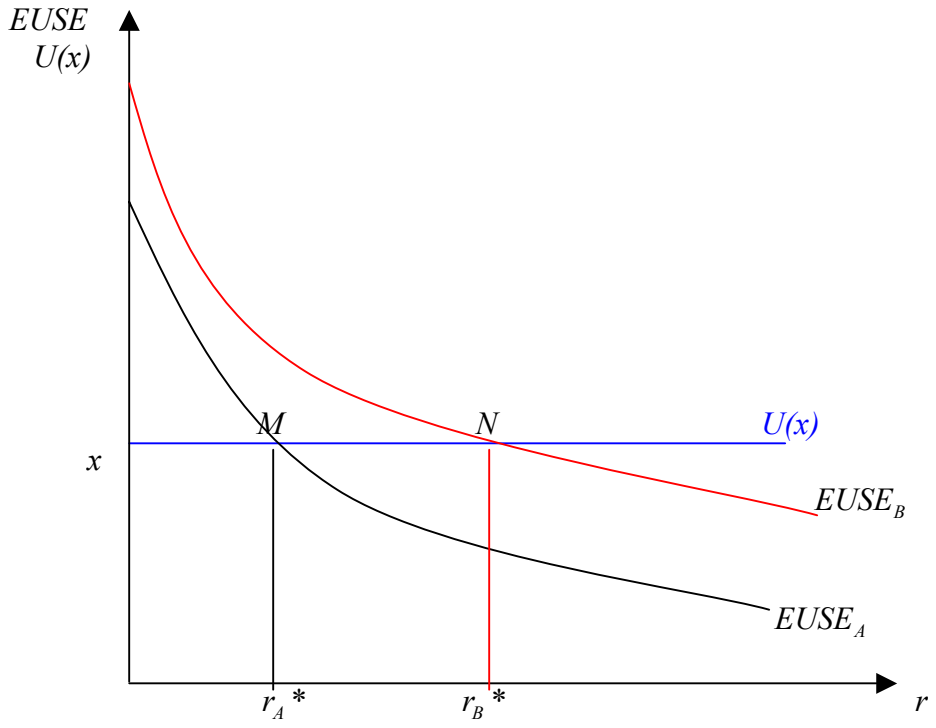

Figure 1. Determination of critical relative risk aversion for group A and B.

The total income of group *A* is the sum of earnings from self-employment and wages:

$$A^* = \alpha_A(1 - r_A^*)x + \alpha_A r_A^* \frac{1}{2z}\int_{-Z}^{Z}(x + \delta + \varepsilon)d\varepsilon \qquad (4)$$

such that,

$$A^* = \alpha_A(x + \delta r_A^*) \qquad (5)$$

Next, consider individuals in group B. They share a cultural or racial trait favorable to entrepreneurship. The individuals in this group receive a higher return from entrepreneurship based on this cultural attribute. Such return increases with the

locational (alternatively, cheap and easy flow of information over spatially separated members of the group) concentration of their fellow (type *B*) individuals.[13] Locational concentration provides easy dissemination of specific information across individuals of this group. It may also be interpreted as a group support in the form of information, capital or technical advice made available to the business entrants of this group by already existing business establishments. It may also take the form of easy availability of credit.[14] Stated alternatively, existence of family members or fellow group members with similar business experiences can raise the expected returns for new entrants, as long as there is positive externality from sharing the information within the group. Denote such return by $y_B = (\alpha_B)^{K_B}$, where k_B is an exogenous constant.[15] Clearly, smaller the size of this special group, smaller is the return. On the other hand, if k_B is low (say, < 1), increasing the group size reduces the return from group affiliation. Even if $k_B = 0$, returns from being in the particular group, however small, is positive. Therefore, for a given k_B there is an optimum group size which generates positive returns from group affiliation. This is obtained at the point where, $\frac{d^2 EUSE_B}{d\alpha_B^{\,2}} = 0$.

For group *B*, let r_B^* be the critical degree of relative risk aversion. Proportion of

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[13] Use of concentration factor is a methodological proposition for measuring impact of business culture on choice of occupation. A different type of group formation may be found in 'immigrant enclaves' (Borjas, 1986) where location-based cohesiveness plays a crucial role. In the present paper geographical proximity does not have to be crucial as long as information flows smoothly.

[14] Cheap credit may be available to new entrants of the same group owing to the advantage of intra-group peer monitoring. So, larger is the size of group B, greater is the help received by those who are part of this group, whether a potential entrepreneur or not.

[15] In reality, the groups have a varying degree of business orientation. Suppose there are a finite number of groups, each with an expected return from business orientation. It is given by $\alpha_i^{K_i}$, *i=A,B, C*.... For group A in our case, $\alpha_i^{K_i} \approx 0$, while for group *B*, it is > 0.

population belonging to group *B* and distributed above the critical level would then be, $\pi_B^* = 1 - r_B^*$. π_B^* is the proportion of individuals working in equilibrium since their relative risk aversion exceeds the critical level. As before, the actual number of individuals from group *B* working in equilibrium is $\beta^* = \alpha_B \pi_B^*$. The number of group *B* individuals self-employed in equilibrium is given by $\alpha_B r_B^*$.

The critical relative risk aversion for group B is similarly obtained by comparing expected utilities from self-employment and employment: the utility from self-employment being

$$UB = (x + \delta + \alpha_B^{K_B} + \varepsilon)^{1-r_B} \tag{6}$$

and the expected utility:

$$EUSE_B = \frac{1}{2z}\int_{-Z}^{Z} \{x + \alpha_B^{K_B} + \delta + \varepsilon\}^{1-r_B} d\varepsilon \tag{7}$$

On the other hand, utility from employment is:

$$UB(x) = x \tag{8}$$

Point *N* in Fig (1) depicts equilibrium for group *B*.

Evidently, $r_B^* > r_A^*$ owing to the presence of a positive return for group B: $y_B = (\alpha_B)^{K_B}$.

The mean income of this group is then,

$$B^* = \alpha_B(1 - r_B^*)x + \alpha_B r_B^* \frac{1}{2z}\int_{-Z}^{Z} (x + \delta + y + \varepsilon) d\varepsilon \tag{9}$$

A simplification of the above form yields,

$$B^* = \alpha_B[x + (\delta + \alpha_B^{K_B})r_B^*] \qquad (10)$$

Based on the above discussion we offer the following proposition.

Proposition 1: *Individuals affiliated to special economic groups display greater relative risk aversion and earn higher average income compared to others by virtue of group formation.*

4. Tax-Subsidy Policy

We propose a tax-subsidy policy as in Kanbur (1981). It follows from section 3 that although individuals are homogeneous in terms of skill (ability) and risk preference their choice of occupation is determined by private information of the group to which they belong. In this particular example, more individuals from group *B* are represented in entrepreneurship/ self-employment compared to that from group *A*. From a social group's perspective, this asymmetry in occupational distribution is crucial. Variation in self-employment-to-employment ratio across groups leads to between-group income gaps, which cannot be compensated for without access to such group specialties. Comparing equations (5) and (10), one can calculate the difference in average incomes between group A ($A^{**} = A^*/\alpha_A$) and B ($B^{**} = B^*/\alpha_B$) .

$$B^{**} - A^{**} = \delta(r_B^* - r_A^*) + \alpha_B^{K_B} r_B^* \qquad (11)$$

Thus $B^{**} > A^{**}$, since, $\delta > 0$, $(r_B^* - r_A^*) > 0$ and $\alpha_B^{K_B} r_B^* > 0$. $B^{**} = A^{**}$ is possible only when, $r_B^* = r_A^* = 0$, implying everybody is employed under all conditions.

Individuals from group *B*, with a higher representation in self-employment thus

enjoy a higher average income over individuals from group *A*. The policy proposition pertains to devising a suitable tax-subsidy policy such that a redistribution of income from workers to entrepreneurs maximizes social utility. Now, whether that reduces income gaps between groups depends on the elasticity of relative risk aversion across groups to the proposed tax-subsidy policies.

The social utility (Ω) is defined as the sum of the aggregate utility levels for group A and group B, $\Omega = \sigma_A + \sigma_B$, where,

$$\sigma_A = \alpha_A(1 - r_A^*)U(x) + \alpha_A r_A^* \frac{1}{2Z}\int_{-Z}^{Z}(x + \delta + \varepsilon)^{1-r_A^*}d\varepsilon$$

$$\text{and} \quad \sigma_B = \alpha_B(1 - r_B^*)U(x) + \alpha_B r_B^* \frac{1}{2Z}\int_{-Z}^{Z}(x + \delta + \alpha_B^{K_B} + \varepsilon)^{1-r_B^*}d\varepsilon$$

Rearranging, the pre-tax-subsidy social welfare of the economy is given by,

$$\begin{aligned}\Omega &= \sigma_A + \sigma_B \\ &= x(1 - \alpha_A r_A^* - \alpha_B r_B^*) + \frac{1}{2Z}\{\frac{\alpha_A r_A^*}{2 - r_A^*}[(x + \delta + Z)^{2-r_A^*} - (x + \delta - Z)^{2-r_A^*}] \\ &+ \frac{\alpha_B r_B^*}{2 - r_B^*}[(x + \delta + \alpha_B^{K_B} + Z)^{2-r_B^*} - (x + \delta + \alpha_B^{K_B} - Z)^{2-r_B^*}]\}\end{aligned} \qquad (12)$$

Suppose, a proportional tax is imposed on workers from both groups and the entrepreneurs from both groups are subsidized with the help of the proceeds. There is no collection cost or set-up cost and the budget is balanced. A proportional tax on wage lowers income from *x* to *(1-t)x*, *t* being the tax rate. On the other hand, a proportional subsidy shifts $EUSE_A$ (as in fig. 1) and $EUSE_B$ to the right, subject to a marginal

increase in income by $(1+s)$, where, s is the rate of proportional subsidy.[16]

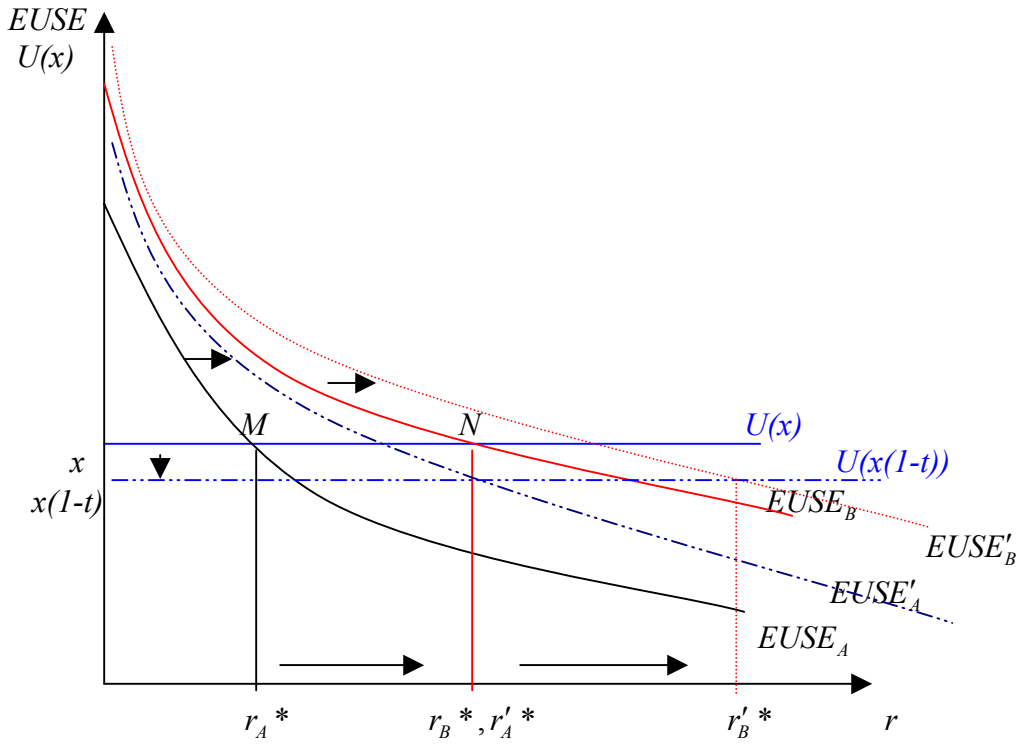

Figure 2. Post tax-subsidy critical relative risk aversion for group A and B.

Therefore, a proportional tax on workers and proportional subsidy to entrepreneurs increases the critical relative risk aversion for both groups A and B. The new critical relative risk aversion points are given by $r'_A{}^*$ and $r'_B{}^*$. Clearly, rate of self-employment for both group increases and rate of employment for both group falls and it is

[16] There are two important considerations here. First, if the government taxes workers without subsidizing the entrepreneurs, that by itself changes the self-employment-to employment ratio in favor of the former. Second, distribution of subsidy may not be equal across both groups. There can be various combinations between groups in the way subsidy is disbursed. One group may get a higher proportion, while the other group gets less. Alternatively, the tax revenue may be used to set-up business schools or business information hubs with greater access for representatives of non-business groups. Even, individuals from non-business groups may get access to cheaper credit from financial institutions as part of subsidy package, if not a direct proportional subsidy. Also, the developing countries with less than proportionate (to population growth) job creation rate has experimented with various self-employment generation schemes to ease out the unemployment problem, receiving mixed response.

determined by equating the post-tax and post-subsidy utilities from employment and self-employment for both groups. For example, individuals from group A now compare:

$$\frac{1}{2Z}\int_{-Z}^{Z}\{(1+s)(x+\delta+\varepsilon)\}^{1-r_A'}d\varepsilon = x(1-t)$$

Similarly, $r_B'^* = r_B'(x,\delta,Z,t)$. As noted earlier, the objective of the government is to choose a tax/subsidy rate, which maximizes social utility. We assume a fully tax-financed subsidy scheme, such that the net revenue is zero. Thus,

$$T = t[\alpha_A(1-r_A^*)+\alpha_B(1-r_B^*)]x$$
$$-s\frac{1}{2Z}[\alpha_A r_A^*\{\int_{-Z}^{Z}(x+\delta+\varepsilon)d\varepsilon\}+\alpha_B r_B^*\{\int_{-Z}^{Z}(x+\delta+\alpha_B^{K_B}+\varepsilon)d\varepsilon\}] = 0$$

Solving for *s*,

$$s = t\frac{2Z(1-\alpha_A r_A^* - \alpha_B r_B^*)x}{[(x+\delta)(\alpha_A r_A^* + \alpha_B r_B^*) + r_B^*\alpha_B^{K_B+1}]} \qquad (13)$$

Accordingly, the post-tax-subsidy utility functions facing group *A* and group *B* are written as,

$$\sigma_A' = \alpha_A(1-r_A'^*)U(x(1-t)) + \alpha_A r_A'^* \frac{1}{2Z}\int_{-Z}^{Z}\{(1+s)(x+\delta+\varepsilon)\}^{1-r_A^*}d\varepsilon$$

and $$\sigma_B' = \alpha_B(1-r_B'^*)U(x(1-t)) + \alpha_B r_B'^* \frac{1}{2Z}\int_{-Z}^{Z}\{(1+s)(x+\delta+\alpha_B^{K_B}+\varepsilon)\}^{1-r_B^*}d\varepsilon$$

Thus the post tax-subsidy social utility is,

$$\Omega' = \sigma'_A + \sigma'_B$$
$$= x(1-t)(1-\alpha_A r'_A{}^* - \alpha_B r'_B{}^*) + \frac{1}{2Z}\{\frac{\alpha_A r'_A{}^*}{2-r'_A{}^*}(1+s)^{2-r'_A{}^*}[(x+\delta+Z)^{2-r'_A{}^*} - (x+\delta-Z)^{2-r'_A{}^*}]$$
$$+ \frac{\alpha_B r'_B{}^*}{2-r'_B{}^*}(1+s)^{2-r'_B{}^*}[(x+\delta+\alpha_B{}^{K_B}+Z)^{2-r'_B{}^*} - (x+\delta+\alpha_B{}^{K_B}-Z)^{2-r'_B{}^*}]\} \quad (14)$$

Equations (12) and (14) provide conditions under which social welfare increases. In other words, social welfare increases if, $\Omega' - \Omega > 0$, for a suitable choice of *t*. Thus,

$$\Omega' - \Omega = x\{(1-t)(1-\alpha_A r'_A{}^* - \alpha_B r'_B{}^*) - (1-\alpha_A r_A{}^* - \alpha_B r_B{}^*)\}$$
$$+ \frac{1}{2Z}\{\frac{\alpha_A r'_A{}^*}{2-r'_A{}^*}(1+s)^{2-r'_A{}^*}[(x+\delta+Z)^{2-r'_A{}^*} - (x+\delta-Z)^{2-r'_A{}^*}]$$
$$- \frac{\alpha_A r_A{}^*}{2-r_A{}^*}[(x+\delta+Z)^{2-r_A{}^*} - (x+\delta-Z)^{2-r_A{}^*}]\}$$
$$+ \frac{1}{2Z}\{\frac{\alpha_B r'_B{}^*}{2-r'_B{}^*}(1+s)^{2-r'_B{}^*}[(x+\delta+\alpha_B{}^{K_B}+Z)^{2-r'_B{}^*} - (x+\delta+\alpha_B{}^{K_B}-Z)^{2-r'_B{}^*}]$$
$$- \frac{\alpha_B r_B{}^*}{2-r_B{}^*}[(x+\delta+\alpha_B{}^{K_B}+Z)^{2-r_B{}^*} - (x+\delta+\alpha_B{}^{K_B}-Z)^{2-r_B{}^*}]\} \quad (15)$$

In order to find the optimal tax rate, we substitute *s* from (13) in (15),

$$\Omega' - \Omega = x\{(1-t)(1-\alpha_A r_A'^* - \alpha_B r_B'^*) - (1-\alpha_A r_A^* - \alpha_B r_B^*)\}$$
$$+\frac{1}{2Z}\{\frac{\alpha_A r_A'^*}{2-r_A'^*}\left[1+t\frac{2Z(1-\alpha_A r_A^* - \alpha_B r_B^*)x}{(x+\delta)(\alpha_A r_A^* + \alpha_B r_B^*) + r_B^* \alpha_B^{K_B+1}}\right]^{2-r_A'^*}[(x+\delta+Z)^{2-r_A'^*} - (x+\delta-Z)^{2-r_A'^*}]$$
$$-\frac{\alpha_A r_A^*}{2-r_A^*}[(x+\delta+Z)^{2-r_A^*} - (x+\delta-Z)^{2-r_A^*}]\}$$
$$+\frac{1}{2Z}\{\frac{\alpha_B r_B'^*}{2-r_B'^*}\left[1+t\frac{2Z(1-\alpha_A r_A^* - \alpha_B r_B^*)x}{(x+\delta)(\alpha_A r_A^* + \alpha_B r_B^*) + r_B^* \alpha_B^{K_B+1}}\right]^{2-r_A'^*} \times$$
$$[(x+\delta+\alpha_B^{K_B}+Z)^{2-r_B'^*} - (x+\delta+\alpha_B^{K_B}-Z)^{2-r_B'^*}]$$
$$-\frac{\alpha_B r_B^*}{2-r_B^*}[(x+\delta+\alpha_B^{K_B}+Z)^{2-r_B^*} - (x+\delta+\alpha_B^{K_B}-Z)^{2-r_B^*}]\} \qquad (16)$$

And obtain t^* from $\frac{\delta(\Omega'-\Omega)}{\delta t} = 0$. The second-order condition may be verified from

$$\frac{\delta^2(\Omega'-\Omega)}{\delta t^2} < 0$$

This solves for $t^* = t(x, \delta, Z, \alpha_A, k_B)$. We do not rule out the possibility of multiple solutions. In the event of multiple solutions, the government chooses a particular tax rate based on a subsequent objective: t that reduces the income gap between social groups.

For this, we compare the elasticity of post tax-subsidy critical relative risk aversion of group *A* and *B* to a small change in t^*. Let us suppose that the government wants to reduce the average income gap between group *A* and *B* in favor of the former. Thus choose a tax rate, such that,

$$\frac{\delta r_A'^*}{\delta t^*}\frac{t^*}{r_A'^*} > \frac{\delta r_B'^*}{\delta t^*}\frac{t^*}{r_B'^*} \qquad (17)$$

In other words, choice of a tax rate is limited to the case where the elasticity of critical

relative risk aversion for group *A* is greater than that of group *B*. The tax rate should be so chosen that, following a small change in the tax rate individuals in group *A* reacts more compared to those in group *B*. As a result, in the post-tax regime a relatively higher percentage of individuals from group *A* would enter the self-employment category compared to that from group *B*. As self-employment earnings exceed earnings from employment, this increases the average income of group *A*. Although, the average income of group *B* also increases, the percentage change for this t^* is lower than that of group *A*'s.

Based on the above analysis we offer the following proposition:

> **Proposition 2**: *A proportional tax-subsidy policy increase social utility and reduces inter-group income disparity if the elasticity of relative risk aversion to changes in tax rates is greater for individuals in group A.*

5. Concluding Remarks

In this paper, we study the influence of group-based culture on the occupational choice of individuals. Between two groups of individuals, one group nurtures a working class culture while the other group has a strong entrepreneurial culture, despite similar abilities and risk-preference across groups. Measuring the impact of culture is not easy in an economic context. The return from cultural traits is captured by the individual's cohesiveness to a group of individuals who have strong entrepreneurial acumen. The return materializes through access to information, or easier access to capital, or ideas or market concepts that remain private information for the specific

group. Individuals from a certain group enjoy this benefit compared to individuals belonging to the other group. We show that this enterprising group of individuals displays higher critical relative risk aversion and that a larger proportion of the population enters business. The average income accruing to individuals of this group exceeds that earned by individuals fro the other group.

The inter-group income disparity that results from such occupational choice pattern may be corrected by using a suitable tax-subsidy policy. The tax policy may also be used to raise the level of social welfare.

The policy implications of this paper are straightforward. For an underrepresented group in business, a subsidy would push a larger proportion of individuals to a risky alternative. The importance of this construct lies not on the fact that a tax-subsidy policy increases proportion of entrepreneurs from a group, but that it acts as a substitute for a cultural trait and even as a second-best, it may increase social welfare.

An alternative to the direct subsidy scheme could be the establishment of an information hub for the disadvantaged group, which may include free counseling or business training. This definitely has other general equilibrium implications for the economy that may be compared against the policy proposed here.

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