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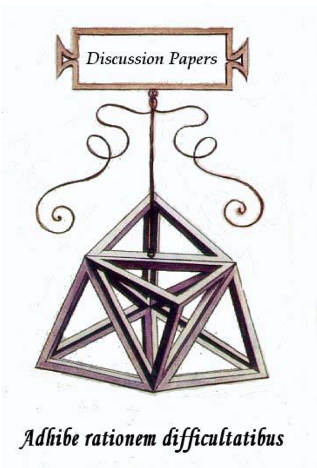

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Redistributing opportunities in a job search model: the role of self-confidence and social norms

Abstract

In this paper we explore the effects of redistributive policies in a job search model where different degrees of self-confidence generate different arrival rates of new jobs. We find that the job search model is an useful framework to address behavioral concerns about personal motivation. We find that self-confidence and effort are complements in the performance of search activity. Moreover rewards, i.e. moving to better jobs, are negative reinforces for self-confidence if the distribution of wages is stationary. We analyze the effect of redistributing policies of opportunities that aim to compress the distribution of the job arrival rates. Finally the presence of social norms generates multiple equilibria.

JEL classification: J63, J64, H53, Z13.

Keywords: Job search, self-confidence, social norms.

Contents

I. Introduction

Search theories in the labor market have been recently used to analyze empirical regularities as workers flows and wage dispersion. In particular one of the most important result derived from this strand of literature has been to show how pure wage dispersion among identical workers arises as an equilibrium outcome in a general equilibrium model characterized by search frictions (Burdett and Mortesen, 1998). In this respect the standard job search model offers an explanation of why identical workers that search for better jobs receive offers that differ with respect to wage rates. From the theoretical point whether a worker earn more than another one depends on factors that are purely stochastic as search is random and the cumulative distribution function of wages in equilibrium is shown to be continuous and to have no mass point. Thus the literature originated by Burdett and Mortensen (1998) explains pure wage dispersion not explained by the standard neoclassical wage equation.

Another compelling explanation of why identical workers are paid differently concerns the theory of the behavioral determinants of earnings. Robust empirical evidence show that behavioral traits, as some some aspects of personality, may be considered to some extent as determinants of earnings (see e.g. Bowles, Gintis and Osborne, 2001 and Cawley, Heckman and Vytlacil, 2001). Social networks, patience, perseverance and self-confidence among others may explain part of the inequality that is not explained by the (neoclassical) standard wage equation. All these traits explain part of earnings differences, as well as different (upward) mobility rates, despite the fact they are not productive skills, i.e. they do not provide any contribution to the production as they do not enter the production function.

A first concern of this paper is to bring together the behavioral determinants of individual success in the labor market, for instance individual wage growth and amount of time experienced to find better jobs, and search theories. In the standard job search model the natural object to address behavioral concerns is the search activity; in this paper we focus our attention on the search intensity supplied by employed workers that determines the job arrival rate. We model the individual choice in a way that the size of the arrival rates of better jobs is partially determined by a particular behavioral trait.

Searching for a (better) job is a task that beyond effort requires self-confidence and perseverance. In this paper we bring in a very simple way the behavioral concerns about self-confidence and personal motivation in the job search model.[1] We find that the job search theory is a good framework to address several behavioral aspects of personal motivation. In particular we find that some premises of motivation theory (Benabou and Tirole, 2002) are incorporated in the job search model when it accounts for motivational concerns. In particular the premise according to which effort and ability are complements, that is, in terms of our model, the more one person is self-confident the more he will exert search effort on the job. Moreover we find that rewards (to have found a new job) are negative reinforces (i.e. finding a better job decreases the level of self-confidence of a worker) if the the distribution of wages is stationary.

In the model we introduce heterogeneity with respect to an innate (behavioral) attribute of individuals, i.e. the level of self-esteem adjusted for the relative importance that worker attributes to luck for individual labor success. This attribute, depending on wage workers' wages, affects the decision to manipulate information about the marginal increase in the likelihood of obtaining a job in response to an increase in the search intensity. This in turn affects the job arrival rate and the search effort supplied: those who are endowed with a greater level of this attribute supply more effort in equilibrium and thereby experience greater job arrival rates. On the empirical side the importance of on-the-job search is widely recognized as one of the main factors determining the individual wage growth. Theoret-

[1] There are few papers that analyzes behavioral concerns in search and matching models, more in general papers on behavioral labor economics. See DellaVigna and Paserman (2005) and Drago (2004) among others.

ically in the standard job search model each (acceptable) job offer is associated to a wage increase.[2]

Therefore in our model behavioral traits generate different opportunities for individual wage growth. The difference of arrival rates between those who do not exploit self-confidence in the matching process is even increasing in the presence of an increases of all the outside wage offers.[3] Finally we show a simple redistributive policy that attenuates job arrival rate differentials. To the extent that this job arrival rates differentials are driven by different degree of self-esteem, that in a certain sense are beyond the individual control, voters may be concerned to redistribute the opportunity to move to better jobs.[4] We impose a linear tax rate on search activity on the workers who search too much and a linear search subsidy on those who search less. We term such a policy as redistributing opportunities in that identical productively individuals may experience more similar arrival rates of better jobs. We study such a policy in the presence of social norms. In particular we assume that there exists social stigma for those who receive the search subsidy. There exists evidence on this fact, see e.g. Moffitt (1983); for example living off subsidies generates disutility so that not all the eligible individuals for welfare programs participate in the programs (Lindbeck, Nyberg and Weibull, 1999). This exercise is more interesting if we posit that the disutility from being a recipient is decreasing in the share of recipients. In this way the strength of disutility is endogenous to the model and we may obtain multiple equilibria (Lindbeck, Nyberg and Weibull, 2002 and 1999).

[2] In a variant of the standard model, it is possible to allow for employers to match outside job offers (Postel-Vinay and Robin, 2002 and 2004) so that at each outside job offer is associated to a wage increase even in the same job.

[3] Note that such a shift may be interpreted as the effect of a pervasive technological shock in the economy. To this extent behavioral traits are more important for individual wage growth in period of technological change (Rubinstein and Tsiddon, 2004).

[4] Interesting studies document that demand for redistribution is higher in societies where rewards are believed to depend on factors that people cannot control, e.g. luck (see Fong, 2002)

II. Preliminaries of the model

In this section we present the basic model we will manipulate for the analysis of self-confidence, redistributive policies and social norms. Consider a continuous and infinite time horizon model. There are two type of economic agents, workers and firms. Both employers and workers are respectively identical and the measure of workers is normalized to one. The matching process takes the form described by the standard search model: firms set the terms of employment (the wage) while workers choose among available offers. In this setting there are frictions because the rate at which workers find a job offer is positive but not equal to infinite and because employees have incomplete information in that they cannot direct their search toward the best wage offers. It is assumed that workers sample wage offers from a known distribution function. Workers are assumed to search for a job both when employed and unemployed, they choose a search effort that increase the rate at which job offers are sampled given the search cost they incur. On the employers side the monopsonistic power deriving from the fact that workers cannot observed the wage offers in the search process is constrained by competition. Firms who post high (low) wages on one hand decrease (increase) their expected profits ($E[\pi]$) and on the other increase (decrease) $E[\pi]$ by increasing (decreasing) the probability to find a worker and by decreasing (increasing) the probability the worker quits to better jobs. It is shown in literature (Burdett and Mortensen, 1998) that a non-degenerate distribution of wage offers characterizes the solution of the non cooperative wage posting game.

More precisely the structure of the model is as follows. All the agents discount future at the rate r. Workers search by drawing a sequential random wage sample from a c.d.f. $F(w)$. Assume $F(w)$ to be continuous on $\langle -\infty, +\infty \rangle$. Assume an interval $\langle b, \overline{w} \rangle$ such that $F(b) = 0$ and $lim_{w \rightarrow \overline{w}} F(\overline{w}) = 1$, and $F(w)$ is twice differentiable on the interval $\langle b, \overline{w} \rangle$, with first derivative strictly positive on $\langle b, \hat{w} \rangle$ and second derivative continuous on $\langle b, \overline{w} \rangle$.[5] Note that

[5]Rather than an assumption, $F(b) = 1$ is derived in equilibrium, where b is the unemploy-

$[1 - F(w')]$ is the probability that a wage offer is at least as great as w', as well as $[F(w')]$ is the probability that a wage offer is less than w'. Every time an offer arrives, the decision of the worker is to accept or not the job offer. There is no recall. For employed and unemployed workers job offers arrive at the rate λs where λ is the so called search efficiency parameter and s the endogenous search effort. Workers incur the search cost $c(s)$, with $c'(s) > 0$, $c''(s) > 0$ and $c(0) = c'(0) = 0$ and receive the unemployment benefit b when they are unemployed. Moreover job are destroyed at the exogenous Poisson rate δ. The value of being employed at a wage w_i and of unemployment, denoted by V and $W(w_i)$, respectively, solve the following Bellman equations:

$$rV = b - c(s) + \lambda s \int max[W(w) - V, 0]dF(w) \tag{1}$$

$$rW(w_i) = w_i - c(s) + \lambda s \int_{w_i}^{\overline{w}} [W(w) - W(w_i)]dF(w) + \delta[V - W(w_i)], \tag{2}$$

Expression (1) states that at each instant the value of unemployment yields a net return equal to the unemployment benefit minus the search cost plus the expected gain deriving from receiving an acceptable job offer. Expression (2) states that the value of being employed yields at each instant a net return equal to the wage rate, minus the cost of search, minus the expected loss of being unemployed, plus the expected return of finding a better job. Workers accept employment if the wage offer is greater than the reservation wage defined as the wage R such that $W(R) = V$. Moreover as the derivative of the value of employment is

$$W'(w_i) = \frac{1}{r + \delta + \lambda s[1 - F(w_i)]} > 0 \tag{3}$$

ment benefit, that as it will be clear, is equal to the reservation wage. Note that we take as given the properties of the c.d.f $F(w)$ that are derived in the analysis of the equilibrium of the standard job search model. For a simple derivation of the market equilibrium see e.g. Mortensen (2003).

by the envelope theorem and the Leibinitz rule, an employed worker quits to another job if and only if it pays a higher wage (cf. Mortensen, 2003). The search effort s maximize the difference between the revenue to search and the search cost and it depends on the current wage:

$$s = argmax_{s\geq 0}\left\{c(s) - \lambda s\int_{w_i}^{\overline{w}}[W(w) - W(w_i)]dF(w)\right\}. \tag{4}$$

Optimality requires the marginal cost of search to be equal to the marginal revenue of search activity:

$$c'(s) = \lambda\int_{w_i}^{\overline{w}}[W(w) - W(w_i)]dF(w). \tag{5}$$

Equation (5) defines an implicit function $g(s,x) = c'(s) - \lambda\int_{w_i}^{\overline{w}}[W(w) - W(w_i)]dF(w)$, where x can be either w_i or λ. The theorem of implicit function assures that the optimal level of effort is monotone decreasing in w and monotone increasing in λ. For a worker employed at wage w the instantaneous rate at which he finds a job with a wage rate greater than w is:

$$H(w) = \lambda s^*[1 - F(w)], \tag{6}$$

where s^* is implicitly defined by (5), and $1/H(w)$ is the expected waiting time to find a better job. Equation (1), (2) and the fact that the reservation wage R solves $W(R) = U$, together imply that the search intensity of an unemployed worker is the same as that of a worker employed at the reservation wage. From this fact we obtain the result that $R = b$ (see Mortensen, 2003 and Mortensen and Pissarides, 1999).

In the standard job search model it is important to distinguish between the distribution of wages offered to job seekers, denoted by $F(w)$, and the distribution of wages received by workers who are currently employed, i.e. the earnings distribution that we denote by $G(w)$, that in general may differ from $F(w)$. Denote by u the fraction of workers currently employed, in equilibrium the flow into unemployment must be equal to the flow into employment:

$$\delta u = \lambda s(R)(1-u) \tag{7}$$

Moreover in equilibrium the flow of workers into jobs that pay w or less must be equal to the outflow of workers from this job. The outflow is the sum of workers who become unemployed because of destruction plus the flow of workers that find a better job offer. The flow into this jobs is equal to the unemployed workers who find a job paying w or less. As it is usual we assume in what follows that the resulting share of population equals the expected one:

$$(1-u)\delta G(w) + [1-F(w)] \int_R^w s(w_i) dG(w_i) = u\lambda s(R)F(w). \tag{8}$$

In general the efficiency parameter λ depends on the recruiting effort of employers and it is derived from the matching function that governs contacts between workers and firms. In what follows we take into account the framework above and we consider the steady state of the economy under which λ is constant.

III. The Model

Economists learned from psychologists that individuals have in many situations an incentive to manipulate information about the probabilities of success of the projects they are involved. In most of the projects that require time and effort, many individuals tend to overrate their ability and efficacy in pursuing such projects (Camerer, 1997). As it has recently emphasized by Benabou and Tirole (2002), confidence in one's ability is a valuable asset and as a consequence there exists a demand for self-serving beliefs which enhance motivation to act. In our simple setting we posit that each worker may decide to have access to programs that induce to manipulate information about search efficiency parameter, λ. Here the crucial assumption for the results we derive is that workers may have imperfect information about the source of λ. In what follows we assume that workers may think about λ as a parameter that depends on the personal efficacy worker possesses in the search process. Such a manipulation process toward higher parameters λ is then interpreted as having the effect to enhance self-esteem in own efficacy in the search activity. As Benabou and Tirole (2002) suggest, the manipulator can be another person, e.g. a friend, a manager. In this respect we can posit that self-confidence arises from workers' participation in social networks that help individuals to enhance the degree of own's efficacy with respect to the share of population who do not participate in these programs. We posit that participation to these programs (manipulation processes) is costly, in particular that each individual has to pay a fraction η of her wage rate.[6]

Why should individuals pay such a fraction that enhances their degree of self-confidence and thinking about a higher (own) λ? Several reasons can be addressed. First if we allow that workers can observe their colleagues' performances, as it will be clear, they will realize that the workers who are involved in these programs (paying fraction η of the wage rate) find job offers at faster rates than workers who do not participate. This reason may be termed as a motivational one. Second, as many papers on behavioral economics pointed out, self-confidence may be interpreted as a consumption value, being an argument of the utility function. This reason may be termed as the hedonic one (cf. Benabue and Tirole, 2002).

We assume that the manipulation of the information about λ is driven by a specific (behavioral) attribute of the worker. We assume that each worker is characterized by the following parameter:

$$\sigma = \frac{self - esteem}{luck} = \frac{x}{y} \tag{9}$$

where $0 < x \leq 1$ is a measure of how much the worker believes to be more efficient in the search process than the other workers, e.g. $x = 1$ means that the worker believes that there are no other workers better than him in the search activity. The denominator $0 < y < 1$ denotes the relative importance that the worker gives to

[6] This is a standard assumption in that information is costly, although in this case good news do not inform workers about the real parameters of the job market. Moreover we shall assume η sufficiently low so that equation (3) is positive for any wage rate.

luck for individual success in the labor market, e.g. $y \cong 1$ means that according to the worker the labor success is almost completely determined by factors that are beyond the individual control, i.e. luck. This assumption is interesting in that two individuals, 1 and 2, may have the same parameter σ but it can be that $x_1 > x_2$ and that $y_1 < y_2$. The parameter σ is distributed in the population according to the c.d.f. $\Theta(\sigma)$, continuous and differentiable, $\Theta'(\sigma) > 0$, with support defined on the interval $[\underline{\sigma}, \overline{\sigma}]$. Upon paying the fraction η of the wage rate, the increase in the rate of efficiency parameter is proportional to the individual attribute σ, precisely the (perceived) efficiency parameter λ rises up to $\lambda + \epsilon\sigma$ where ϵ is a constant less than one. In this way workers believe to face $\lambda + \epsilon\sigma$ instead of the true parameter λ. Accordingly the lifetime utility to be employed at a wage rate w for a worker participating to the program now solves:

$$rW(w_i) = w_i(1-\eta) - c(s) + (\lambda + \epsilon\sigma)s\int_{w_i}^{\overline{w}}[W(w) - W(w_i)]dF(w) + \delta[V - W(w_i)]. \tag{10}$$

The cost of participating to the network is equal for all the workers and it is proportional to the wage rate, whereas the benefit deriving from participation are positive but they vary from individual to individual according to the parameter σ defined above. Equation (10) is easily interpretable: workers who believe to possess better abilities than other colleagues employed at the same wage rate, believe as well to possess more efficacy in the search process. However this trait, that in expression (9) is denoted by x, is weighted by the belief y. Workers who believe that luck matters a lot in the search process attach less importance to self-esteem. Not all the workers will find it convenient to manipulate information about λ.

Proposition 1 *For each wage rate w there exists a critical level $\sigma^*(w)$ such that for any worker with $\sigma(w) \geq \sigma^*(w)$ it is optimal to pay ηw. The critical level σ^* is an increasing function of the wage rate.*

At any wage rate, we term the worker with $\sigma(w) = \sigma^*(w)$ as the marginal participant. For notational concerns, $\sigma(w)$ denotes the specific attribute of a worker employed at the wage rate w. Proposition 1 states that there exists a critical level of σ that defines the participation constraint to the program and that this critical level depends negatively on the wage rate currently earned. Intuitively while the marginal benefit from manipulation process is decreasing with respect to the wage rate, the marginal cost of manipulation process is constant. For the share of workers with $\sigma(w_i) \geq \sigma^*(w_i)$ the lifetime utility to be employed at the wage rate w_i solves equation (10), for the share with $\sigma(w_i) < \sigma^*(w_i)$ the lifetime utility solves equation (2). This formalization is interesting for two reasons. First it makes the efficacy of the parameter σ distributed in the labor force to be state dependent. Whether σ is active depends also on the situations that the workers face and the efficacy of self-esteem is endogenous to the model. This formulation implies that it is more likely that workers tend to overrate their ability if they believe to be "better" than others and if they believe that luck it is not so important for success. Second, this formulation divides the employed workers in two shares: one composed of workers who are, to different degrees, optimistic (self-confident) in their own efficacy respect to the others, believing to face an efficiency parameter equal to $\lambda + \epsilon\sigma$ (for those with $\sigma(w) \geq \sigma^*(w)$); the other composed of workers who are realistic, or we prefer to call pessimistic, in that they (correctly) believe to face a parameter equal to λ.

Proposition 2 *For any wage rate, the offer arrival rate for workers with $\sigma(w) \geq \sigma^*(w)$ is relatively higher than that one of workers with $\sigma(w) < \sigma^*(w)$.*

The arrival rate is equal to the efficiency parameter times the search effort supplied and by equation (5) we know that the optimal level of search effort is increasing with respect to the level of the efficiency parameter. Even if workers with $\sigma \geq \sigma^*$ face the true parameter λ, self-confidence induces them to supply more effort and finally to experience a greater job arrival rate. In this respect beliefs on one's ability and effort are complements as in Benabou and Tirole (2002).

This in turn can justify why workers are willing to pay the fraction η of the wage rate.

When we deal with motivation, a natural question is whether rewards are positive or negative reinforces for self-confidence in the search process. Taking into account a worker with $\sigma(w) \geq \sigma^*(w)$, the question concerns whether the level of self-confidence of this worker, once has found a new job, is reinforced by the reward (to have found a job) or not. We did not specify learning dynamics about the beliefs in one's ability; however note that in this context the results we would expect from learning are consistent with those we in effect obtain here. Indeed while the expected waiting time to find a better a job for a worker with $\sigma(w) > \sigma^*(w)$ is $1/(\lambda + \epsilon\sigma(w))s^*[1 - F(w)]$, in average he will experience $1/\lambda s^*[1 - F(w)]$, where s^* is defined by the Bellman equation (10). This fact would induce workers to decrease their degree of self-confidence. On the other hand workers with $\sigma(w) \geq \sigma^*(w)$ may observe that the amount of time to find a better job for the workers with $\sigma(w) < \sigma^*(w)$ is discretely higher than their waiting time (by Proposition 2). This fact would induce them to increase their degree of self-esteem, in particular x in equation (9). In our model, under the stationarity assumption of the wage distribution, rewards are most likely to be negative reinforces, that is as if the former effect prevailed.

Proposition 3 *For the marginal participant the probability that rewards are negative reinforces is equal to one. For any worker with $\sigma(w) > \sigma^*(w)$, this probability is less than one, monotone increasing with respect to the new (acceptable) wage offer w, and decreasing with respect to σ.*

The last proposition is coherent with the interpretation of σ given by (9): in order to the second effect prevail on the first one, a high degree of self-esteem is needed according to (9).

One of the limitation of the standard job search model concerns the assumption of stationarity of the wage distribution $F(w)$. This assumption does not allow us to analyzes which role plays self-confidence in the search process when the economy is hit by positive technological shocks that brings about a shift of the wage distribution to the right. Suppose that all the (outside) wage offers are increased by an equal and positive constant so that the expected lifetime utility to find a new job increases. This in turn increases the expected benefit to find a new job so that all the workers increase their level of search effort. Interestingly the level of σ^* that defines the participation constraint increases.

Proposition 4 *A shift of the wage distribution F(w) increases* σ^* *for all the wage rates. The job arrival rates differentials among those with* $\sigma(w) < \sigma^*(w)$ *and those with* $\sigma(w) \geq \sigma^*(w)$ *increases.*

Therefore an increase in all the wages offers decreases the share of population that exploits the parameter σ to elicit self-motivation. That is to say that for example the marginal participants give up paying ηw.[7] Moreover the increase in the job arrival rate brought about by the technological change is even greater for the share of population with $\sigma(w) > \sigma^*(w)$.[8] The latter result is in line with the arguments according to which behavioral traits are part of the performances of workers in periods of technological change (see Bowles, Gintis and Osborne, 2001).

IV. Redistributive policy

According to the result derived from the basic model above, for those who pay the fraction η of their wage rate, (those with $\sigma(w) \geq \sigma^*(w)$), the offer arrival rate is discretely higher than one of those embedded with $\sigma(w) < \sigma^*(w)$. In this framework we analyze the implementation and the effects of a redistributive policy of

[7]A sufficient condition for this result is that the marginal cost elasticity is increasing with respect to s (see the Appendix).

[8]The proof on this point is very simple: the increases in the expected gain from moving to new job is amplified by the term $\epsilon\sigma$, this induces more search intensity that in turn leads to a greater job arrival rate.

opportunities. We use this term to mean a policy that aims to compress the distribution of the arrival rates for the population at any wage rate, that is e.g. within groups employed at very close wage rates. Basically heterogeneity in the offer arrival rates depends on behavioral concerns (self-esteem and beliefs about the importance of luck for individual labor market success, expression (9)) that finally lead workers to supply different levels of on-the-job search effort. The policy we implement imposes a linear tax rate on search effort to the (over)confident workers and delivers a linear subsidy on search effort to the remaining share. A linear tax on search activity may appears somewhat unrealistic at a first glance.[9] However in this context it will be clear that such a linear tax is formally equivalent to a tax on job mobility. Suppose fiscal authority can discriminate workers with $\sigma(w) > \sigma^*(w)$, or alternatively among those who exhibited high turnover rates. Then the linear tax rate on search effort has the same effect of a linear tax on the net gain associated to moving to a new job, i.e. $[W(w) - W(w_i)]$, where $W(w)$ is the lifetime utility associated to the new job. In other words our linear tax on search effort affects search activity as a linear tax on $[W(w) - W(w_i]$. The effect consists in a reduction of the return to search activity.[10] Another question is why such a policy might be supported as a political equilibrium. Firstly it is important to stress the importance of the job arrival rates for individual wage growth. For the model above it is immediate that mobility is associated to individual wage growth, and to this extent a greater arrival rate of job offers is associated to wage increases. The standard model of section 2 can be also extended by allowing the employers to match the outside job offers of the poaching employers. In this case on-th-job search is more important for individual wage growth as in some cases an outside wage offer may result in an increase in the wage rate although the outside job is less productive that the current one

[9] A similar scheme is implemented by Acemoglu and Shimer (2000) in a different framework.

[10] Note also that a general equilibrium effect of a reduction in search activity for the workers with $\sigma(w) > \sigma^*(w)$ is to reduce congestion suffered by the fraction of workers with $\sigma(w) < \sigma^*(w)$.

(see Postel-Vinay and Robin, 2002). Beyond an acceptable level of individual luck in the search process, voters may be concerned about the redistribution of opportunities for individual wage growth that are different because of heterogeneity in behavioral traits. More in general voters may be considered as a concern about more equal opportunities for social mobility. As it is shown by several empirical studies, demand for redistribution and for egalitarian policies in driven by beliefs on the causes of individual success in the labor market. Societies are more willing to support redistributive policies if the majority of people believe that the causes of poverty and of richness depend on factors that are beyond the individual control (see e.g. Fong, 2002). Conversely there is less demand for redistribution in societies where rewards in the labor market are believed to depend exclusively on individual effort. Finally here voters may be concerned about redistribution because the job offer arrival rate differentials are driven by behavioral attributes that can be innate and beyond the individual control. [11].

Assume a linear tax on search effort on those who pay the fraction η of their wage rate. We denote such a linear tax as ρ. The total revenue is distributed in form of a (linear) search subsidy to those with $\sigma(w) > \sigma^*(w)$. We denote such a linear subsidy as γ. To this framework we add the presence of a social norm with the regard to the social stigma suffered by those who receive benefits from the welfare state. It is widely documented that there exists a social disutility for being recipients in a welfare program. The most striking evidence is in US where only the 40-70 percent of the eligible individuals for welfare programs (e.g. subsidies, transfers) finally takes part to the programs (cf. Lindbeck, Nyberg and Weibull, 1999). In the formalization of the interaction between economic incentives and social norms we use the simple and tractable procedure of Lindbeck, Nyberg and Weibull (1999) and (2002). We

[11] Even if we do not derive the political equilibrium, it is clear that the extent of such a redistributive policy is most likely to be large in countries where the majority of the workers is embedded with a denominator in expression (9) quite high. This observation would also imply that these countries would experience less job mobility, this is an hypothesis that needs to be investigated

denote such a disutility as μ that enters the lifetime utility of the recipients with minus sign. In this situation lifetime utilities to be employed at the wage rate w_i solve:

$$rW(w_i) = w_i(1-\eta) - c(s) + s\left\{(\lambda + \epsilon\sigma)\int_{w_i}^{\overline{w}}[W(w) - W(w_i)]dF(w) - \rho\right\} + \\ +\delta[V - W(w_i)], if\sigma \geq \sigma^*. \tag{11}$$

$$rW(w_i) = w_i - c(s) + s\left\{\lambda\int_{w_i}^{\overline{w}}[W(w) - W(w_i)]dF(w) + \gamma\right\} + \\ +\delta[V - W(w_i)] - \mu, if\sigma < \sigma^* \tag{12}$$

Taxes and subsidies make participation to the program that lead workers to manipulate information about λ more costly. However this effect is attenuated by the social stigma μ.[12] The critical level of $\sigma^*(w)$ that defines the participation constraint must be written as $\sigma^*(w, \rho, \gamma, \mu)$, increasing in first, the second and the third argument and decreasing in the last one. On the aggregate point of view it is clear why such a policy reduces job arrival rates differentials: with this scheme we have that a share of workers will search more (those who were before with $\sigma(w) < \sigma^*(w)$), and a fraction of workers will search less.

For any level of ρ, γ and μ, denote with z=$\Theta[\sigma^*(w, \rho, \gamma, \mu)]$ the share of recipients, that is obviously decreasing in μ and increasing in ρ and γ.[13] Following most of the papers on social norms we

[12] Note that we implicitly assume that workers must be either taxed or subsidized. For those who do not pay ηw, it is possible to model the choice of refusing the search subsidy (so that they do not experience social stigma), or of accepting the search subsidy. This would happen if the lifetime utility from being subsidized is less than the lifetime utility of not being recipient, given that $\sigma(w) < \sigma^*(w)$. This would happen for the workers employed at sufficiently high wage rates. However the results we can derive from this observation do not change very much the analysis in which we are interested here.

[13] It is possible to derive the explicit value of this measure. However we avoid the calculus for the sake of simplicity; what we need to know is how z varies with respect to the parameters. Moreover recall that $z \in [0, 1]$ and that at any instant we approximate the values of the measures of workers with the expected ones.

assume that μ is a decreasing function of z. More precisely we define $\mu = g(z)$, where $g : [0,1] \to R_+$, continuously differentiable with $g' < 0$. In this way the critical level $\sigma^*(w)$ now depends also on the share of recipients z (substitutes $\mu = g(z)$ in the expression of z), i.e. both σ^* and and the intensity of μ are endogenous to the model. In this context individuals face a strategic environment as the payoffs of worker's behavior depends on the behaviors of the other workers. As it is standard a profile of individual choice, given ρ and γ, and for each level of the wage rate, is a Nash equilibrium if and only if z satisfies the following fixed point equation:

$$z = Q(z) \tag{13}$$

where Q is a function that maps the unit interval into itself: $Q : [0,1] \to [0,1]$ and z is defined by above to be equal to $\Theta[\sigma^*((w), \hat{\rho}, \hat{\gamma}, g(z))]$, where the hat on ρ and γ means that they are taken as given. In equation (13) $Q(z)$ is an increasing function of the endogenous variable z ($g' < 0$, σ^* is decreasing with respect to z and $\Theta'[\sigma] > 0$). The function $Q(z)$ is continuous in the unit interval, thus, given ρ and γ, there exists at least one fixed point, denoting the Nash equilibrium. Note that if the disutility μ were a constant, then there would have existed exactly one fixed point. However as μ is a decreasing function of the share of the recipients, depending on the functional form of $g(z)$, we can obtain more than one fixed points, i.e. multiple equilibria. This is a result common in the literature on social norms, as well as when they are brought in the welfare state (Lindbeck, Nyberg and Weibull, 1999, 2002). It is possible to show with the usual arguments that if we augment the model with a certain degree of learning in a stochastic environment with imperfect information of the workers, then in the in case of three equilibria, given the feedback effect above, the stable equilibria are the extreme ones.

In what follows we restrict our analysis to balanced policies, that is policies that satisfy the budget constraint according to which the total revenue from taxes has to be equal to the total amount of subsidies delivered. Denote with R and S the total revenue and the total amount of subsidies, respectively:

$$R = (1-u)(1-\Theta[\sigma^*(w,\rho,\gamma,\mu)) \int_R^{\overline{w}} \rho s(w) dG(w) \tag{14}$$

$$S = (1-u)\Theta[\sigma^*(w),\rho,\gamma,\mu)) \int_R^{\overline{w}} \gamma s(w) dG(w) \tag{15}$$

We call a balanced equilibrium the equilibrium such that equation (13) and $R = S$ are simultaneously satisfied. We end up with the following proposition that closes the model.

Proposition 5 *For each share of recipients z exists exactly one balanced policy such that $R = S$ and for any balanced policy there exists at most on share of recipient z that satisfied fixed point equation (13).*

Of course the strength of the disutility may depend also on the denominator of equation (9) as well as the extent of redistribution.

V. Conclusion

In this paper we introduced in a very simple way the behavioral trait of self-confidence in the standard job search model. We explored the effects of self-confidence and we found some interesting results in line with the theory according to which behavioral traits can be important for individual labor market success. In our case self-confidence affects the rate at which wage offers are sampled as well as the expected time to find a better job. Self-esteem and effort are complements, and rewards are most likely to be negative reinforces. Moreover self-confidence is more effective when the the distribution of the wage shifts to the right, e.g. because of the arrival of a technological shock. In such a model we explored a simple redistributing policy that attenuates job arrival rates differential. We introduced in the analysis the presence of social norms, namely social stigma and guilt deriving from being subsidized. The presence of the social norm is relevant when we assume that the extent to which it affects individual decision is endogenous to the model. In this case we found equilibrium conditions and optimal strategies and we show how we can obtain multiple equilibria. Future research concerns deeper analysis of the interaction of social norms and of the behavioral trait presented in section 3 (expression 9) as well as the analysis of the political equilibrium studying voting processes that may interact in the model with the behavioral traits we introduced.

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Appendix

Define marginal cost elasticity $\beta(s) = sc''(s)/c'(s)$ and assume it's increasing with respect to s although it is not a necessary condition for the results showed below.

Proof of Proposition 1. Intuitively σ^* increases with the wage because the marginal benefit from manipulation associated to a greater wage decreases (the c.d.f $F(w)$ is bounded) while the marginal cost of manipulation is constant. Denote $[\int_{w_i}^{\overline{w}}[W(w)-W(w_i)]dF(w)$ with E. For the worker it is optimal to pay ηw if and only if:

$$c(s^*) - \lambda s^* E - c(s^{**}) + \lambda s^{**} E > \eta w - \lambda \epsilon \sigma s^{**} E \tag{16}$$

where s^* is given by equation (4) and s^{**} is the argmax of arg max of $[c(s) - (\lambda + \sigma\epsilon)s \int_{w_i}^{\overline{w}}[W(w) - W(w_i)]dF(w)]$. Note that the LHS of equation (16) is strictly negative. Indeed s^* is the arg max of $-c(s) + \lambda s E$, whereas $s^{**} > s^*$ is not. Then a necessary condition for (16) to hold is $\lambda\epsilon\sigma s^{**}E - \eta w > 0$. Inequality (16) is satisfied as an equality for a unique σ^*. Deriving σ^* from (17) as an equality and differentiating σ^* with with respect to w, we find the derivative to be positive using the envelope theorem. Prop. 2 derives from equation (5) and Prop. 3 from the proof of Prop. 1.

Proof of Proposition 4. Denote with E' the gain $[\int_{w_i}^{\overline{w}}[W(w) - W(w_i)]dF(w)]$ after the the shift on the right of the wage distribution distribution occurred. Denote σ^{oo} the critical level required to participate in the program after the shift occurred. We have the critical equal to $\sigma^{oo} = [c(s^{oo}) - c(s^o)]/\lambda\epsilon\sigma E' s^{oo} + (s^{oo} - s^o)/\epsilon\sigma s^{oo} + \eta w/\lambda\epsilon\sigma s^{oo} E'$, where s^{oo} is the argmax of $[c(s) - (\lambda + \sigma\epsilon)sE']$ and s^o is the argmax of $[c(s) - \lambda s E']$. If we compute $\sigma^{**} - \sigma^{oo}$, where σ^{**} is defined above in (16) as an equality, we find that it negative, meaning that the critical level of σ increased.

Proof of proposition 5. To show the first part take as given the share of recipients z; from $R = S$ let consider γ as the independent variable, then ρ is an increasing function of γ. On the other hand recall that the share of recipients is increasing with respect to γ and to ρ. Therefore from the expression of z we can derive that ρ is an decreasing function of γ: for a higher γ is needed a lower ρ for z to be constant, and viceversa. For the second part suppose a share of recipients $\overline{z}$ satisfies $R = S$, and take as given the tax and subsidy rates. Then it is immediate to see that any $z \neq \overline{z}$ results in a deficit or in a surplus of the budget constraint.

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