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IDEOLOGICAL POLICY MAKERS
IN A DYNAMIC MODEL WITH
ENDOGENOUS PREFERENCES**

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**CULTURAL RELATIVISM AND IDEOLOGICAL POLICY MAKERS IN A
DYNAMIC MODEL WITH ENDOGENOUS PREFERENCES**

Abstract: This paper shows that two societies differing because of the people's initial propensity to devote time and efforts to non-profit activities may never converge. This lack of convergence is interpreted as the tendency of the cultural values and attitudes dominant in each society to perpetuate because of the economic behavior and the social processes that they contribute to elicit. Furthermore, it may not be possible to rank the different steady states toward which these two societies converge according to the Paretian criterion. Finally, the paper examines policies that promote values and attitudes non coincident with those that are currently dominant.

JEL Classification Numbers: D11, D60, H20, J30, L31.

Key Words: Economic policy, Multiple steady states, Social capital, Altruism, Non-profit.

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1 INTRODUCTION

Cultural relativism is the principle that an individual's beliefs and convictions make sense in terms of his or her own culture. Economists pay their methodological tribute to this principle as they abstain from normative judgements and maintain that economic outcomes should be evaluated in terms of some function of the preferences and tastes of those individuals whose well-being is affected by these outcomes, no matters what these preferences or tastes may be (“De gustibus non est disputandum”). Economists are also increasingly interested in the endogenous formation of preferences and beliefs and in the process whereby cultural values and economic outcomes mutually condition each other.¹ An important—although still largely unexplored—implication of the hypothesis that cultural traits and socio-economic configurations tend to co-evolve in close interaction is that the individuals living in a society may prefer the economic outcomes prevailing in their own society to the economic outcomes of another society, while the individuals living in the latter may prefer the economic outcomes of their own society to those prevailing in the former: given the different preferences that have emerged in each society, individuals strictly prefer the equilibrium configuration characterizing their own society to that characterizing the other society. In these cases, economists should consistently suspend any judgement about which of the two socio-economic equilibria is more desirable.

This sort of agnosticism should not be necessarily shared by policy makers. Indeed, it is perfectly legitimate for a policy maker to implement policies that draw their inspiration from values and moral norms and that aim at affecting society's attitudes and propensities. In this case, it is inappropriate to model the public policies as the result of the maximization of

¹ Among the significant contributions concerning the formation, transmission and evolution of norms and cultural values, see Arrow (1974), North (1990), Becker and Madrigal (1994), Denzau and North (1994), Greif (1994), Becker (1996), Kreps (1997), Posner (1997), Bisin and Verdier (1998), Bowles (1998), Fernandez e Fogli (2005).

some function of individual preferences. Indeed, scope of the policy maker is not to select policies that can optimally reflect the society's current preferences, but rather to push an ideological agenda aimed at "changing" people's minds.

In the last few years economic models have started analyzing the interaction between public policies and the evolution of tastes, attitudes and values. It has been recognized that the Lucas critique should be extended to any economic policy evaluation which assesses the effects of alternative public choices by treating individual preferences as invariant with respect to these choices.² This recognition amounts to consider that "the effectiveness of policies and their political viability may depend on the preferences they induce or evoke" (Bowles, 1998, p.104).³ This notwithstanding, the theory of economic policy is still neglecting the conceptual difficulty arising when the welfare criterion adopted by the policy maker rests on individual preferences that are influenced by its own actions.⁴ Furthermore,

² Aaron (1994) was the first—to my knowledge—to have noted that it applies to values or tastes what holds for Lucas with regard to expectations, namely that it is incorrect to assess the relative merits of alternative policies by treating expectations as invariant with respect to changes in policy.

³ One of the few formal analysis of the interdependence between policy and preferences is conducted by Bar-Gill and Fershtman (2005) with an evolutionary model of subsidizing contributions to a public good. Some recent papers model the role of legal policies in shaping individual attitudes toward trustworthiness, honesty and fairness (Huck, 1998; Bohnet et al., 2001; Bar-Gill and Fershtman, 2004). The impact of policy interventions on the intergenerational transmission of values is modeled by Hauk and Saez-Marti (2002). Palacios-Huerta and Santos (2004) focus on the role of market arrangements in affecting individual preferences by modeling the influence of the extent of markets on risk attitudes.

⁴ Von Weizsacker recognizes the essence of this difficulty: "The efficiency or Pareto optimality properties of general equilibrium models rest on the assumption of fixed tastes. Are these efficiency theorems relevant to a world with changing tastes? Surely, purely exogenous changes of tastes (from the point of view of the economist) will essentially not alter these theorems...But what about Pareto optimality if endogenous variables of the economic system influence tastes?" (Von Weizsacker, 1971, p. 346).

this theory ignores that—even in democratic societies—it is not rare the case of policy makers which intend purposefully to utilize their policy instruments for promoting cultural and moral values, or for encouraging (or discouraging) propensities and attitudes, that are highly controversial and sometimes shared only by a minority of the population.⁵

This paper addresses these issues by considering an economy where profit-maximizing firms and non-profit organizations coexist. In this context, the non-profit organizations have an “altruistic” objective, and the people’s attitudes toward working in one of them may depend on the degree of cohesion, generalized trust and altruism existing in the social environment, namely on the stock of “social capital” existing in the society.⁶ Hence, a peculiar hypothesis underlying the general equilibrium model proposed in this paper is that the people’s propensity to devote time and efforts to non-profit activities depends on the outstanding endowment of social capital.⁷ In its turn, the formation of social capital is

⁵ George W. Bush’s “ownership society” might be considered a recent example of a policy agenda that has the declared scope of promoting values (individualism, virtues of owning property, personal responsibility...) even at the price of pushing unpopular reforms like the proposal to reshape Social Security with private accounts. On the conflict between the idea that society “may have to opt for a metapreference in favor of challenging the prevailing preferences of its members and to ask if and how these preferences can perhaps be improved” and the idea that there should be no “person or group of persons who from their ‘superior’ point of view dictate the values of society” see Von Weizsacker (1971).

⁶ The concept of social capital used here is close to the definition of Putnam et al. (1993), according to which the social capital has to be intended as those networks of human relations and those systems of norms and shared values that make coordination and cooperation easier. It is worth emphasizing that—differently from physical and human capital—social capital conceived in this way cannot be privately appropriated, since it is embedded in the community that generated it. Moreover, the accumulation of social capital is often to be considered as a by product of individual or collective behavior aiming at other scopes, and not as a result of actions made intentionally by individuals, organizations or groups in order to increase its stock.

⁷ There is a vast literature which has recognized a fundamental characteristic of many non-profit organizations in the motivational mix of those operating within them, whose behavior is not exclusively self-interested. Indeed,

stimulated by an increase in the aggregate volume of activities undertaken by the non-profit organizations.⁸ Therefore, a public policy subsidizing the activities of these organizations has an indirect effect on people's preferences concerning the level of effort to devote to these organizations via its positive impact on the accumulation of social capital.

The paper is organized as follows. Section 2 presents the basic model; section 3 derives the general equilibrium of the economy in the absence of public policies; section 4 examines the policies of both non-ideological and ideological policy makers; section 5 concludes.

2 THE BASIC MODEL

Let us consider an economy in discrete time populated by a continuum (of measure one) of households. The time horizon is infinite and in each period t the households consume both a good x_t and a service which may differ with respect to its quality q_t .⁹ The good x_t is

the mission inspiring the existence and actions of those organizations allows them to rely also on altruistic and ethical motives. Thus, the non-profit organizations are able to mobilize resources that otherwise would be left unused (for instance, voluntary labor, social engagement and care that without them would not find the ways and the reasons for being activated). This tends to occur mainly in organizations whose aims are prevailing social and altruistic and not merely coincident with the interests of those directly involved in their functioning: the "external social benefits generated by the firm employing the worker" may play an important role in motivating the firm's employees (see Preston, 1989, 1993; Mirvis, 1992; Borzaga, 2000). As a matter of fact, the prevailing evidence seems to confirm that—in comparison to the workers employed in for-profit or public enterprises—those working in these organizations are willing to accept lower wages or to give more effort and time because of their extra-monetary motivations, without experiencing lower levels of satisfaction (see e.g. Brown and McIntosh, 1998; Almond and Kendall, 2000a, 2000b; Borzaga, 2003a).

⁸ The role of the nonprofits in the formation of social capital has been recently stressed by Evers and Schulze-Böing (1998), Evers (2001), Laville and Nyssens (2001). The idea is that, by evoking non-selfish motivations in individuals and by channelling them in collective actions, the nonprofits generate positive externalities, since they strengthen civic spirit, community bonds and networks based on reciprocity and trust.

⁹ One may think of the households as immortal extended families ("dynasties").

homogeneous and is produced by a continuum (of measure one) of perfectly competitive firms which maximize their profits. Similarly, there is a continuum (of measure one) of non-profit organizations that produce the service.¹⁰ The quality of the service depends on the effort and care with which labor operates in the non-profit organizations.

2.1 The profit-maximizing firms

The profit-maximizing firms produce the consumer good x_t according to the technology

$$x_t = S_t^\xi, \quad 0 < \xi < 1, \quad (1)$$

where S_t are the units of labor employed by the representative firm producing the consumer good. Since production is standardized, it requires a fixed level of effort $e_t = \hat{e}$ to each unit of labor. The representative firm chooses its labor input in order to maximize its profit π_t :

$$\max_{S_t} \pi_t \quad (2)$$

subject to

$$\pi_t = \pi(S_t, w_t) = S_t^\xi - S_t w_t, \quad (3)$$

where w_t is the real wage paid to each unit of labor. Note that x_t is taken to be the numéraire of this economy and that the price of x_t is arbitrarily set to be one.

2.2 The non-profit organizations

The non-profit organizations produce the consumer service. The units of the service that an organization delivers, N_t , depend on the units of labor that it employs, L_t :

$$N_t = L_t^\zeta, \quad 0 < \zeta < 1, \quad (4)$$

¹⁰ The non-profit organizations operating in the health, in the education and social services industries can be considered examples of the organizations modeled in the paper. In most countries, as a matter of fact, the nonprofits are concentrated in the sector producing personal, social and community care services.

The quality of the service provided by the organization, q_t , depends on the labor's level of effort e_t :

$$q_t = e_t, \quad e_t \geq 0. \quad (5)$$

Since labor's effort is perfectly observable, the non-profit organization makes pay contingent on the effort level:

$$v_t = v(e_t), \quad (6)$$

where v_t is the wage paid by the representative organization to a unit of labor whose effort level is e_t . At the beginning of each period, the organization signs a labor contract with its workforce establishing the effort level and the pay of each unit of labor that it employs.

A household buys the service that it wants to consume from one single producer, which amounts to saying that the consumer selects a unique quality level for the service that s/he wants to buy. The price that a service-producing unit can charge for each unit of service depends on the quality of its service:

$$p_t = p(q_t), \quad (7)$$

where the "hedonic" function $p(q_t)$ is given to any single organization.

A plausible objective of a non-profit organization is to maximize the utility $g(N_t, q_t)$, $g_N > 0$ and $g_q > 0$, that a typical household can obtain by consuming its service. Furthermore, the organization must balance its budget if it wants to avoid bankruptcy: the non-profit unit must be able to finance its operations in the marketplace without making losses.¹¹ Thus, the problem faced by the representative service-producing unit at the beginning of the period can be formulated as

$$\max_{v_t, L_t} g(N_t, q_t) \quad (8)$$

¹¹ Thus, the organization that we are modeling is a commercial non-profit firm, i.e., namely a nonprofit that collects the resources needed for its functioning in the marketplace by selling its services.

subject to (4)-(7) and to the budget constraint

$$p(q_t)L_t^\zeta - v_t L_t \geq 0. \quad (9)$$

Note that--for simplicity and without loss of generality--non-profit organizations must balance their budget in each period. Moreover, by attributing to them the objective of maximizing the utility that their representative customer can get from their service, we assume implicitly that such organizations maximize some mix of quantity and quality of the service produced. This is consistent with the remark that in a non-profit organization profit maximization is not replaced by an unique alternative aim but rather by a mix of objectives (see Borzaga, 2003b).¹² One should also consider that the objective of maximizing the utility that the consumers can get from the service delivered by the organization coincides with the managers' interest of increasing the economic value of the organization's activities: they can exert control on a larger amount of resources by providing more units of the service and improving its quality without jeopardizing the survival of the organization.

The presence of competition among nonprofits enables consumers to choose the most favorable combination of quality and prices, inducing the service-producing units to optimize their operations in order to survive. Indeed, also a non-profit organization has an incentive to raise its revenues for increasing the quantity and improve the quality of the service that it delivers. In particular, a quality improvement entails a cost increase, which conflicts with the organization's interests in producing more units of the service and in balancing its budget.

Note that in order to simplify the analysis we ignore the presence of (physical and human) capital as a factor of production in both sectors. This is motivated by the fact that our

¹² In the literature, different objectives are attributed to non-profit organizations. One may contrast the hypothesis that those managing a non-profit organization have a higher preference for the quality of the good it produces (see Hansmann, 1980) with the assumption that a non-profit organization simply maximizes the quantity produced or the output (see Ben-Ner et al., 1993).

focus is on how employment, output quality and individual welfare are affected by changes in preferences about working in organizations which operate in those service sectors that are typically labor intensive and where quality depends mainly on labor's care and attention. In this framework, inserting (physical and human) capital would have complicated the analysis without adding any particular hint for a better understanding of the issue that we are focusing on.

2.3 Evolution of individual preferences

The non-profit organizations have a non-monetary objective and their "mission" is to maximize the satisfaction that a typical household can obtain by consuming their services. Therefore, they may be able to motivate their employees also by means of non-monetary incentives, namely by--at least partly--sharing their "altruistic" mission with them. Hence, a non-profit organization may enjoy a comparative advantage in motivating labor relatively to a for-profit firm: the same effort level may cause more disutility to a worker if s/he works in a for-profit firm than if s/he works in a non-profit organization. However, we maintain that the attitudes toward working in a non-profit organization depend on the degree of cohesion and altruism existing in the social environment, namely on the stock of "social capital" existing in the society. Thus, the evolution of the subjective attitude toward working in a non-profit organization is not controlled by any single individual, since it is governed by the change in cultural values and ethical codes taking place in the social environment and influencing individual preferences and mentality.

The essence of what is discussed above is captured by assuming that the representative household's disutility of working is given by

$$f(e_t, L_t, S_t, \eta_t) = S_t \hat{\omega} e_t^\gamma + L_t \eta_t e_t^\gamma, \quad \hat{\omega} > 0, \gamma \geq 1, S_t + L_t \leq 1. \quad (10)$$

In (10), S_t and L_t represent the fractions of time that the household devotes, respectively, to working in for-profit firms and in non-profit organizations, where the household's total time

endowment is normalized to be one. Hence, $1-S_t-L_t$ can be interpreted as time spent at home (“leisure”). Note that $\gamma > 1$ is consistent with an increasing marginal disutility of effort (as $\gamma = 1$, one may think that utility decreases linearly with e_t). The variable η_t ($\eta_t > 0$) reflects the subjective attitude toward working in a non-profit organization and decreases with the stock of “social capital” existing in the society:

$$\eta_t = r(K_t), \quad r' < 0, \quad K_t \geq 0, \quad (11)$$

where K_t is the stock of social capital in period t . In contrast, we assume for simplicity that the individual attitudes toward working in a profit-maximizing firm remain constant ($\omega_t = \hat{\omega} > 0 \quad \forall t$). We focus, indeed, on the possible evolution of the *relative* attitude toward working, namely on the possible change over time of the attitude toward working in a non-profit organization relative to the attitude toward working in a for-profit firm.

In its turn, the society’s endowment of social capital is positively affected by the aggregate volume of activities undertaken by the non-profit organizations, although any single non-profit organization has only a negligible impact on the formation of social capital. In other words, it is assumed that--as a byproduct of their activities--these organizations contribute to strengthen the altruistic orientation of society, thus acting as significant creators of social capital. Hence,

$$K_{t+1} = \mu + \rho K_t \left(1 - \frac{K_t}{\sigma} \right) + m(N_t, q_t), \quad \mu > 0, \rho > 0, \sigma > 0, K_0 \text{ given}, \quad (12)$$

where $m(N_t, q_t) = 0$ if $N_t = q_t = 0$, with $m_N > 0$ and $m_q > 0$. In (12), social capital is treated as a renewable resource: in the absence of non-profit activities ($N_t = q_t = 0$), the society’s capability to regenerate its stock of social capital is limited. The presence of active organizations with an “altruistic” mission increases the society’s ability to accumulate social capital, where in equation (12) the aggregate volume of activities undertaken by the non-profit organizations is approximated by the units of service produced (N_t) and the average quality of the service (q_t).

2.4 Households as workers and consumers

The individual's budget constraint is:

$$S_t w_t + L_t v_t + \pi_t \geq x_t + p(q_t)N_t, \quad (13)$$

where--for simplicity and without loss of generality—it is assumed that all households receive an equal share of the profits generated by the firms producing the good x_t . Note also that the hedonic function $p(q_t)$ is given to any single consumer and that—in this simple economy where no asset can be privately appropriated--the households consume their entire disposable income.

The utility that a household obtains by consuming the service is separable between the units N_t and the quality q_t of the service that it buys:

$$g(N_t, q_t) = N_t^\alpha + q_t^\beta, \quad 0 < \alpha < 1, 0 < \beta < 1. \quad (14)$$

Separability is assumed in (14) in order to simplify the analysis, in the light of the fact that both opposite cases can be plausible: the case in which a small improvement of the service quality increases the marginal utility of the service quantity and the case in which a small improvement of the service quality decreases the marginal utility of the service quantity.

The problem that the households solve in each period t is the following:

$$\max_{x_t, N_t, q_t, L_t, S_t, e_t} u_t \quad (15)$$

subject to the time constraint $S_t + L_t \leq 1$ and to the budget constraint (13), where

$$u_t = u(x_t, N_t, q_t, e_t, L_t, S_t; \eta_t) = x_t + g(N_t, q_t) - f(e_t, L_t, S_t; \eta_t). \quad (16)$$

The utility function given by (16) is quasi-linear, implying that the service satisfies a basic need. It is assumed that the household's disposable income is always enough to prevent the demand for the service from being rationed: the demand for the service is independent of the level of disposable income and the consumption of x_t is strictly positive.

3 MARKET EQUILIBRIUM

3.1 Labor-market equilibrium conditions

It is straightforward from (10)-(16) that the necessary conditions for inducing a household to supply units of time to a profit-maximizing firm and to a service-producing unit with an effort level e_t are, respectively,

$$w_t - \hat{\omega} \hat{e}^\gamma \geq 0, \quad (17a)$$

$$v(e_t) - \eta_t e_t^\gamma \geq 0. \quad (17b)$$

Assuming perfect labor mobility between the for-profit and non-profit segments of the labor market, equilibrium requires that:

$$w_t - \hat{\omega} \hat{e}^\gamma = v(e_t) - \eta_t e_t^\gamma. \quad (18)$$

One can have two possible cases: (i) if in equilibrium $w_t - \hat{\omega} \hat{e}^\gamma = v(e_t) - \eta_t e_t^\gamma > 0$, each household strictly prefers working rather than staying at home and the equilibrium is necessarily characterized by $S_t + L_t = 1$; (ii) if in equilibrium $S_t + L_t < 1$, each household is indifferent between working and staying at home and the equilibrium is necessarily characterized by $w_t - \hat{\omega} \hat{e}^\gamma = v(e_t) - \eta_t e_t^\gamma = 0$. Indeed, if $w_t - \hat{\omega} \hat{e}^\gamma = v(e_t) - \eta_t e_t^\gamma > 0$ and $S_t + L_t < 1$, the households would supply more units of time, and this increase in labor supply would exert a downward pressure on wages in both segments of the labor market and an upward pressure on the effort level that the workers commit to make in the service sector for any given pay level. Thus, if $w_t - \hat{\omega} \hat{e}^\gamma = v(e_t) - \eta_t e_t^\gamma > 0$ whenever $S_t + L_t = 1$, the workers enjoy some rent: they are paid in equilibrium more than their reservation wage. In contrast, if $w_t - \hat{\omega} \hat{e}^\gamma = v(e_t) - \eta_t e_t^\gamma = 0$ whenever $S_t + L_t < 1$, labor demand is not enough to absorb the entire households' time endowment even if the conditions in terms of wage and required effort are barely acceptable for the households.

Equilibrium in the labor market requires also

$$S_t^s = S_t^d, \quad (19a)$$

$$L_t^s = L_t^d. \quad (19b)$$

3.2 Product-markets equilibrium conditions

An equilibrium quantity of the manufactured good is such that

$$x_t^s = x_t^d. \quad (20)$$

The equilibrium price of the service $p_t = p(q_t)$ must be such that at that price both the units of the service supplied are equal to the units demanded and the quality of the service supplied by the representative non-profit organization is equal to the quality level demanded by the representative consumer:

$$N_t^s = N_t^d, \quad (21a)$$

$$q_t^s = q_t^d. \quad (21b)$$

3.3 Households' optimizing behavior

Solving (15), we obtain the conditions that the consumers' demand for the service must satisfy for optimality:

$$p(q_t) = \alpha N_t^{\alpha-1}, \quad (22a)$$

$$p'(q_t)N_t = \beta q_t^{\beta-1}, \quad (22b)$$

and the condition that the household's effort level must satisfy when it works in a service-producing unit:

$$v'(e_t) = \gamma \eta_t e_t^{\gamma-1}. \quad (22c)$$

It is evident that the rule applied by an optimizing household to decide whether to work and--possibly--in what type of firm to work produces the conditions (17).

3.4 For-profit firms' optimizing behavior

The optimality condition of the profit-maximizing firms is

$$\xi S_t^{\xi-1} = w_t, \quad (23a)$$

from which one can easily obtain their optimal demand for labor:

$$S_t = S(w_t) = \left(\frac{\xi}{w_t} \right)^{\frac{1}{1-\xi}}. \quad (23b)$$

3.5 Non-profit organizations' optimizing behavior

For an interior solution to (8), a non-profit organization operating in the marketplace must satisfy the following conditions:

$$\zeta p(e_t) L_t^{\zeta-1} = v(e_t) - \frac{\alpha \zeta L_t^{\alpha \zeta - 1}}{\lambda_t}, \quad (24a)$$

$$L_t^{\zeta} p'(e_t) = L_t v'(e_t) - \frac{\beta e_t^{\beta-1}}{\lambda_t}, \quad (24b)$$

$$p(e_t) L_t^{\zeta} = v(e_t) L_t, \quad (24c)$$

where λ_t is a multiplier measuring the marginal benefit that a non-profit organization obtains by a small improvement in its budget.¹³

Note that the non-profit organization does not equalize the value of the marginal productivity of labor at the optimal effort level to the wage that must be paid to generate the optimal effort level, since it also cares about the additional benefit that the representative

¹³ Alternatively, one can use (9) to write $L_t = \left[\frac{p(e_t)}{v(e_t)} \right]^{\frac{1}{1-\zeta}}$ and solve the optimization problem by substitution,

thus obtaining the following necessary condition for a maximum: $d(e_t)=0$, where

$$d(e_t) = \frac{\alpha \zeta}{(1-\zeta)} \left\{ \frac{v(e_t) p'(e_t) - v'(e_t) p(e_t)}{[v(e_t)]^2} \right\} \left[\frac{p(e_t)}{v(e_t)} \right]^{\frac{\alpha \zeta}{1-\zeta} - 1} + \beta e_t^{\beta-1}. \text{ Hence, a value of } e_t \text{ that maximizes the}$$

objective function of the non-profit organization must satisfy both $d(e_t)=0$ and $d'(e_t)<0$.

household can obtain from a marginal increase in the units of the service. This benefit has more weight in the optimal decision-making of the organization when in its optimal plan it attributes a smaller value to a marginal improvement in its budget. In other words, the smaller λ_t is, the more the organization's employment policy differs from the policy that would be optimal for a profit-maximizing firm.

Furthermore, the non-profit organization does not equalize the additional labor cost necessary to obtain a marginal improvement in quality to the increment in revenues due to the higher price that it can charge on all the units of its service thanks to the improved quality of its service. Indeed, the organization's optimal plan must also take account of the beneficial impact on the consumers' welfare due to the improvement in the quality of its service. Again, the smaller λ_t is, the more the organization's policy on quality differs from the policy that would be optimal for a profit-maximizing firm. In other words, the non-profit organization equalizes the additional labor cost that it must incur in order to achieve a marginal improvement in the quality of all the units produced to the additional revenues that it can obtain by a marginal improvement in the quality of its service plus the marginal benefit accruing to the consumers because of the better quality of the service (weighted by the inverse of λ_t).

3.6 General equilibrium path

To save space, we focus on the case that is more relevant from a practical point of view, namely on the case where the parameter values are such that in equilibrium the households devote some time to leisure ($S_t + L_t < 1$).

In this case, the equilibrium wages are:

$$w_t = w = \hat{w} \hat{e}^\gamma, \quad (25a)$$

$$v_t = \eta_t e_t^\gamma. \quad (25b)$$

Given (4)-(7) and (21)-(25), one can compute the general equilibrium values of L_t , e_t and S_t as functions of the households' attitudes toward working in a non-profit organization:

$$L_t = l(\eta_t) = \left[\left(\frac{\alpha}{\eta_t} \right)^\beta \left(\frac{\beta}{\alpha\gamma\zeta} \right)^\gamma \right]^{\frac{1}{\alpha\gamma\zeta + (1-\alpha\zeta)\beta}}, \quad (26a)$$

$$e_t = q_t = z(\eta_t) = \left[\frac{\alpha\gamma\zeta}{\beta} \left(\frac{\beta}{\gamma\zeta\eta_t} \right)^{\alpha\zeta} \right]^{\frac{1}{\alpha\gamma\zeta + (1-\alpha\zeta)\beta}}, \quad (26b)$$

$$S_t = S = \left(\frac{\xi}{\hat{\omega}\hat{e}^\gamma} \right)^{\frac{1}{1-\xi}}, \quad (26c)$$

where $l(\eta_t) + S < 1$. Note that one has both $l' < 0$ (entailing $\frac{dN_t}{d\eta_t} < 0$) and $z' < 0$: the fraction of time and the levels of effort and quality fall in the service sector whenever working in a non-profit organization becomes less attractive. Since $r' < 0$ (see equation (11)), this implies that a higher stock of social capital raises the fraction of time and the levels of effort and quality in the service sector.

By recalling equation (11), one can use (26a) and (26b) to rewrite the law of motion of social capital (see (12)) as a difference equation in K_t only:

$$K_{t+1} = k(K_t), \quad K_0 \text{ given}, \quad (27)$$

where $k(K_t) = \mu + \rho K_t \left(1 - \frac{K_t}{\sigma} \right) + m \left([l(r(K_t))]^\zeta, z(r(K_t)) \right)$.

3.7 Steady states

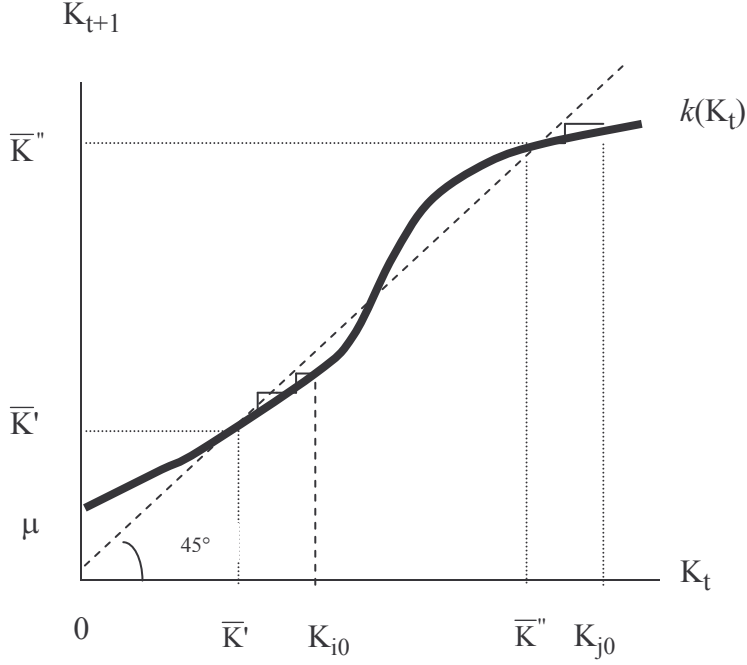
By considering that $r' < 0$, $l' < 0$, $z' < 0$, $m_N > 0$ and $m_q > 0$, one can verify that multiple steady-state level of social capital may exist: if the stock of social capital is high (low), the disutility of working in the non-profit sector tends to be low (high), thus determining a high (low) level of activities in the non-profit sector, which in its turn contributes to keep high

(low) the stock of social capital. In particular, there may exist more than one steady-state level of social capital which are locally stable: if \bar{K} denotes a steady-state level of social capital, i.e., a value of K satisfying $K_{t+1}=K_t=K$ in equation (27), there may exist at least two \bar{K} , say \bar{K}' and \bar{K}'' , $\bar{K}'' > \bar{K}' > 0$, such that both $\left| \frac{dk(K_t)}{dK_t} \right|_{K_t = \bar{K}'} < 1$ and $\left| \frac{dk(K_t)}{dK_t} \right|_{K_t = \bar{K}''} < 1$ (see the Appendix). In this case, two societies i and j characterized by different initial levels of social capital may differ forever even if they are structurally similar, namely if they have the same parameter values: if $K_{i0} \in (\bar{K}' - \varepsilon, \bar{K}' + \varepsilon)$ and $K_{j0} \in (\bar{K}'' - \varepsilon, \bar{K}'' + \varepsilon)$, $\varepsilon > 0$, then $\lim_{t \rightarrow \infty} K_{it} = \bar{K}'$ and $\lim_{t \rightarrow \infty} K_{jt} = \bar{K}''$, $i \neq j$ (see figure 1). This lack of convergence can be interpreted as the tendency of the cultural values and attitudes dominant in each society to perpetuate because of the economic behavior and the social processes that they contribute to elicit.

It is also worth to emphasize that it is not possible in general to rank the two steady states according to the Paretian criterion, since any conclusion concerning what allocation gives more welfare to the representative household depends on the metric that one takes into consideration. For instance, given the evolution of the households' preferences in society i (i.e., given $\bar{\eta}' = r(\bar{K}')$), it can be the case that the long-run market equilibrium emerging in i is strictly preferred by those living in i to the long-run market equilibrium emerging in j ; and—symmetrically—given the evolution of the households' preferences in society j (i.e., given $\bar{\eta}'' = r(\bar{K}'')$), it can be the case that the long-run market equilibrium emerging in j is strictly preferred by those living in j to the long-run market equilibrium emerging in i : $u(\bar{x}', \bar{N}', \bar{q}', \bar{e}', \bar{L}', \bar{S}'; \bar{\eta}') > u(\bar{x}'', \bar{N}'', \bar{q}'', \bar{e}'', \bar{L}'', \bar{S}''; \bar{\eta}'')$ and $u(\bar{x}'', \bar{N}'', \bar{q}'', \bar{e}'', \bar{L}'', \bar{S}''; \bar{\eta}'') > u(\bar{x}', \bar{N}', \bar{q}', \bar{e}', \bar{L}', \bar{S}'; \bar{\eta}')$, where $\bar{x}' = \bar{x}'$, $\bar{N}' < \bar{N}''$, $\bar{q}' = \bar{e}' < \bar{q}'' = \bar{e}''$, $\bar{L}' < \bar{L}''$, $\bar{S}' = \bar{S}''$, $\bar{\eta}' > \bar{\eta}''$ (see the Appendix).

FIGURE 1

Phase line of eq. (28) with multiple stable steady states



4 PUBLIC POLICIES

Suppose that there is a policy maker which may subsidy or tax the consumers' purchase of the service. Hence, the households' budget constraint (13) can be rewritten as

$$S_t w_t + L_t v_t + \pi_t - T_t \geq x_t + (1 - \tau_t) p(q_t) N_t, \quad \tau_t < 1, \quad (28)$$

where T_t are public transfers and $\tau_t p(q_t) N_t$ is the subsidy (if $\tau_t > 0$) or the tax (if $\tau_t < 0$) on the consumers' purchase of the service. The policy maker must balance its budget in each period:

$$T_t = \tau_t p(q_t) N_t. \quad (29)$$

Given (28), the optimality conditions satisfied by the consumers' demand for the service become:

$$(1 - \tau_t) p(q_t) = \alpha N_t^{\alpha-1}, \quad (30a)$$

$$(1 - \tau_t) p'(q_t) N_t = \beta q_t^{\beta-1}, \quad (30b)$$

Given (4)-(7), (21), (23), (24), (25) and (30), one can compute the general equilibrium values of L_t and e_t as functions of the households' attitudes toward working in non-profit organizations and of the subsidy rate:

$$L_t = L(\eta_t, \tau_t) = \left[\left(\frac{\alpha}{\eta_t(1-\tau_t)} \right)^\beta \left(\frac{\beta}{\alpha\gamma\zeta} \right)^\gamma \right]^{\frac{1}{\alpha\gamma\zeta+(1-\alpha\zeta)\beta}}, \quad (31a)$$

$$e_t = q_t = Z(\eta_t, \tau_t) = \left[\frac{\alpha\gamma\zeta}{\beta} \left(\frac{\beta}{\gamma\zeta\eta_t(1-\tau_t)} \right)^{\alpha\zeta} \right]^{\frac{1}{\alpha\gamma\zeta+(1-\alpha\zeta)\beta}}, \quad (31b)$$

where $L(\eta_t, \tau_t) + S < 1$. It is easy to check that both $\frac{\partial L_t}{\partial \tau_t} > 0$ (entailing $\frac{\partial N_t}{\partial \tau_t} > 0$) and $\frac{\partial e_t}{\partial \tau_t} > 0$:

an increase in the public subsidy on the purchase of the service leads to an increase in the quantity and quality of the service produced by the non-profit organizations.

It is apparent that now the motion of social capital depends also on public policy:

$$K_{t+1} = K(K_t, \tau_t), \quad K_0 \text{ given}, \quad (32)$$

where $K(K_t, \tau_t) = \mu + \rho K_t \left(1 - \frac{K_t}{\sigma} \right) + m \left([L(r(K_t), \tau_t)]^\zeta, Z(r(K_t), \tau_t) \right)$. By subsidizing the non-profit activities, public policies influence the evolution of cultural values and collective mentality, thus contributing to shape future preferences.

4.1 Optimal policy of non-ideological policy makers

A non-ideological policy maker takes as given the social process governing the evolution of individual preferences. Such a policy maker selects a policy which is optimal with respect to the society's current preferences and does not seek intentionally to affect the metric (individual preferences) according to which its performances are measured. Thus, in each period t its problem is the following:

$$\text{Max}_{\{\tau_{t+i}\}_{i=0}^{\infty}} \sum_{i=0}^{\infty} \theta^i u_{t+i}, \quad 0 < \theta < 1, \quad (33)$$

subject to the balanced budget constraint (29) and treating the process governing the evolution of individual preferences as given, where θ is a discount rate.

Since the optimal policy reflects individual preferences and is not selected by assessing its effects on future preferences, the policy maker's problem can be decomposed in a sequence of static problems:

$$\max_{\tau_t} (1 - \xi) \left(\frac{\xi}{\hat{\omega} \hat{e}^\gamma} \right)^{\frac{\xi}{(1-\xi)}} + \left[1 - \frac{\alpha}{(1 - \tau_t)} \right] [L(\eta_t, \tau_t)]^{\alpha\zeta} + [Z(\eta_t, \tau_t)]^\beta. \quad (34)$$

By computing the interior solution to (34), one can obtain the optimal policy:¹⁴

$$\tau^* = \tau_t^* = 1 - \frac{(\alpha\zeta\gamma + \beta) \left[\frac{\alpha^\beta}{(\alpha\zeta\gamma)^\gamma} \right]^{\frac{\alpha\zeta}{\alpha\zeta\gamma + (1-\alpha\zeta)\beta}}}{\zeta\beta \left[\frac{\alpha\zeta\gamma}{(\zeta\gamma)^{\alpha\zeta}} \right]^{\frac{\alpha\zeta}{\alpha\zeta\gamma + (1-\alpha\zeta)\beta}} + \zeta \left[\frac{\alpha^\beta}{(\alpha\zeta\gamma)^\gamma} \right]^{\frac{\alpha\zeta}{\alpha\zeta\gamma + (1-\alpha\zeta)\beta}}}. \quad (35)$$

By substituting τ^* for τ_t in (32), one has the law of motion of social capital under a non-ideological policy maker: $K_{t+1} = K(K_t, \tau^*)$. Again, there may exist at least two steady-state levels of social capital, say \bar{K}° and $\bar{K}^{\circ\circ}$, $\bar{K}^{\circ\circ} > \bar{K}^\circ > 0$, which are locally stable (see the Appendix); and again two structurally similar societies i and j differ forever if $K_{i0} \in (\bar{K}^\circ - \varepsilon, \bar{K}^\circ + \varepsilon)$ and $K_{j0} \in (\bar{K}^{\circ\circ} - \varepsilon, \bar{K}^{\circ\circ} + \varepsilon)$. In short, public policies that reflect society's preferences tend to accommodate the society's inclination to reinforce the existing set of cultural values, attitudes and preferences. Therefore, it is generally the case that--given the

¹⁴ The first-order condition for an interior solution to (34) is:

$$\frac{-\alpha [L(\eta_t, \tau_t)]^{\alpha\zeta}}{(1 - \tau_t)^2} + \frac{\alpha\beta\zeta \left\{ \left[1 - \frac{\alpha}{(1 - \tau_t)} \right] [L(\eta_t, \tau_t)]^{\alpha\zeta} + [Z(\eta_t, \tau_t)]^\beta \right\}}{(1 - \tau_t)[\alpha + (1 - \alpha\zeta)\beta]} = 0.$$

evolution of the households' preferences in society i (i.e., given $\bar{\eta}^o = r(\bar{K}^o)$)--the long-run equilibrium emerging in i is strictly preferred by the members of society i to the long-run equilibrium emerging in j ; and symmetrically for the long-run equilibrium emerging in j .

4.2 Optimal policy of ideological policy makers

An ideological policy maker seeks intentionally to influence the evolution of individual preferences. Such a policy maker does not select a policy which is optimal with respect to the society's current preferences, since one of its objectives is to favor the emergence of cultural values and social attitudes which do not coincide with those that are currently dominant. Obviously, even an ideological policy maker cannot ignore the society's current preference when it selects its policy: its objective function should be a compromise between the mere reflection of the current societal preferences and the willingness to promote the cultural values and social attitudes that it intends to favor. Thus, one may assume that in each period t the problem of an ideological policy maker is the following:

$$\text{Max}_{\{\tau_{t+i}\}_{i=0}^{\infty}} \sum_{i=0}^{\infty} -\theta^i \left[\psi (\tau_{t+i} - \tau^*)^2 + (1 - \psi) (\eta_{t+i} - \eta^*)^2 \right] \quad 0 < \psi < 1, \quad (36)$$

subject to (11) and (32). The period objective function in (36) is a loss function: the policy maker assigns a weight ψ to minimize the quadratic deviation of the policy parameter τ_t from that value τ^* (see (35)) which reflects optimally the society's current preferences and a weight $1-\psi$ to minimize the quadratic deviation of the preferences parameter η_t from that value η^* which the policy maker considers desirable. Consistently with this setup, a policy maker whose choices respond uniquely to the current society's preferences ($\psi=1$) and a purely ideological policy maker ($\psi=0$) are extreme cases of a more general pattern where policy makers take into account the societal preferences but aim also at influencing them. By solving (36) (see the Appendix), one obtains the Euler equation

$$\Lambda(\eta_{t+1}, \tau_{t+1}, \eta_t, \tau_t) = -\theta(1 - \Psi)(\eta_{t+1} - \eta^*) - \frac{\Psi(\tau_t - \tau^*) \frac{dr^{-1}(\eta_{t+1})}{d\eta_{t+1}}}{m_N \zeta L_t^{\zeta-1} \frac{\partial L(\eta_t, \tau_t)}{\partial \tau_t} + m_q \frac{\partial Z(\eta_t, \tau_t)}{\partial \tau_t}} +$$

$$+ \frac{\theta \Psi(\tau_{t+1} - \tau^*) \left[\frac{dr^{-1}(\eta_{t+1})}{d\eta_{t+1}} \left(1 - \frac{2r^{-1}(\eta_{t+1})}{\sigma} \right) \rho + m_N \zeta L_{t+1}^{\zeta-1} \frac{\partial L(\eta_{t+1}, \tau_{t+1})}{\partial \eta_{t+1}} + m_q \frac{\partial Z(\eta_{t+1}, \tau_{t+1})}{\partial \eta_{t+1}} \right]}{m_N \zeta L_{t+1}^{\zeta-1} \frac{\partial L(\eta_{t+1}, \tau_{t+1})}{\partial \tau_{t+1}} + m_q \frac{\partial Z(\eta_{t+1}, \tau_{t+1})}{\partial \tau_{t+1}}} = 0 \quad (37)$$

and the law of motion of the preference parameter

$$\Omega(\eta_{t+1}, \eta_t, \tau_t) = r^{-1}(\eta_{t+1}) - \mu - \rho r^{-1}(\eta_t) \left(1 - \frac{r^{-1}(\eta_t)}{\sigma} \right) - m([L(\eta_t, \tau_t)]^\zeta, Z(\eta_t, \tau_t)) = 0. \quad (38)$$

Equations (37) and (38) govern the equilibrium path of the economy under an ideological policy maker. A steady-state pair $(\bar{\eta}, \bar{\tau})$ can be found by imposing $\eta_{t+1} = \eta_t = \eta$ and $\tau_{t+1} = \tau_t = \tau$ in (37)-(38). An ideological policy maker can lead society j (which is characterized by $\eta_{j0} = r(K_{j0}) \in (\bar{\eta}^\circ - \varepsilon, \bar{\eta}^\circ + \varepsilon)$) to converge to $(\bar{\eta}^{**}, \bar{\tau}^{**})$, where we consider combinations of values of ψ and η^* such that $\bar{\eta}^{**} \in (\bar{\eta}^\circ - \varepsilon, \bar{\eta}^\circ + \varepsilon)$ and $\bar{\tau}^{**} \in (\tau^* - \varepsilon, \tau^* + \varepsilon)$ (see the Appendix). In particular, if $\eta^* < \bar{\eta}^\circ$, society j will converge to a steady-state pair $(\bar{\eta}^{**}, \bar{\tau}^{**})$ such that $\eta^* < \bar{\eta}^{**} < \bar{\eta}^\circ$ and $\bar{\tau}^{**} > \tau^*$ (or alternatively, if $\eta^* > \bar{\eta}^\circ$, society j will converge to $(\bar{\eta}^{**}, \bar{\tau}^{**})$ such that $\eta^* > \bar{\eta}^{**} > \bar{\eta}^\circ$ and $\bar{\tau}^{**} < \tau^*$) (see the Appendix). Similarly, if $\eta^* < \bar{\eta}^\circ$, where η^* is the desirable value of the preference parameter for the policy maker of society i (which is characterized by $\eta_{i0} = r(K_{i0}) \in (\bar{\eta}^\circ - \varepsilon, \bar{\eta}^\circ + \varepsilon)$), this society will converge to a steady-state pair $(\bar{\eta}^\bullet, \bar{\tau}^\bullet)$ such that $\eta^* < \bar{\eta}^\bullet < \bar{\eta}^\circ$ and $\bar{\tau}^\bullet > \tau^*$ (or alternatively, if $\eta^* > \bar{\eta}^\circ$, society i will converge to $(\bar{\eta}^\bullet, \bar{\tau}^\bullet)$ such that $\eta^* > \bar{\eta}^\bullet > \bar{\eta}^\circ$ and $\bar{\tau}^\bullet < \tau^*$). In other words, the attitudes that emerge in the long run are a compromise between those considered desirable by the ideological policy maker and those that would have emerged under policies reflecting the current society's preferences.

The presence of an ideological policy maker has obvious consequences for the equilibrium volume of activity and level of service quality in the non-profit sector. It is not surprising, indeed, that in the long run the non-profit activities are more (less) subsidized and the individual disutility of devoting time and efforts to these activities is lower (higher) when the policy maker intends to promote (discourage) the emergence of values and attitudes favorable to the non-profit sector than when it is non ideological.

5 CONCLUSIONS

Beside giving an original contribution to the modeling of a market economy with a non-profit sector, the paper focuses on two points that are relevant when the evolution of social norms and cultural values is influenced by economic outcomes and--in the same time-- contributes to change those individual attitudes and propensities that are important determinants of economic outcomes.

First, the paper formally addresses some implications of the self-reinforcing process that is generated when the evolution of social norms and cultural values is influenced in a society by economic outcomes which in their turn depend on the individual attitudes and propensities that are prevailing in that society. Indeed, the model presented here shows that two societies differing only because of their initial stock of social capital, i. e., only because of the people's initial propensity to devote time and efforts to non-profit activities, may keep their differences in terms of preferences and volume of non-profit activities forever. This lack of convergence can be interpreted as the tendency of the cultural values and attitudes dominant in each society to perpetuate because of the economic behavior and the social processes that they contribute to elicit. Furthermore, it may not be possible to rank the different long-run equilibria toward which these two societies converge according to the Paretian criterion. This amounts to say that the two steady-state equilibria are

incommensurable, since any welfare judgement must refer to cultural values and preferences that are specific to each society.

Second, the paper shows that public policies reflecting the society's current preferences cannot but reinforce the tendency of the cultural values and attitudes dominant in each society to perpetuate, since these policies accommodate the spontaneous evolution that each society would have followed in the absence of public interventions. In contrast, the paper examines policies that are not optimal with respect to the society's current preferences, since one of the policy maker's objectives is to favor the emergence of cultural values and social attitudes which do not coincide with those that are currently dominant. Obviously, even an ideological policy maker cannot ignore the society's current preference when it selects its policy: its objective function should be a compromise between the mere reflection of the current societal preferences and the willingness to promote the cultural values and social attitudes that it intends to favor.

Further research is necessary for better understanding of the complex relationship linking the economic outcomes and the choice of public policies to the formation of individual preferences and the evolution of social norms.

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APPENDIX

1 The equilibrium path in the absence of public policy

Let specify

$$m(N_t, q_t) = \delta(N_t q_t)^\varphi, \delta > 0, \varphi > 0, \quad (A1)$$

$$r(K_t) = K_t^\pi, \pi > 0. \quad (A2)$$

Given (26a), (26b), (A1) and (A2), $k(K_t)$ can be rewritten as

$$k(K_t) = \mu + \rho K_t \left(1 - \frac{K_t}{\sigma}\right) + \delta \left\{ \left[\frac{\alpha \gamma \zeta}{\beta} \left(\frac{\beta K_t^\pi}{\gamma \zeta} \right)^{\alpha \zeta} \right] \left[\left(\alpha K_t^\pi \right)^{\zeta \beta} \left(\frac{\beta}{\alpha \gamma \zeta} \right)^{\zeta \gamma} \right] \right\}^{\frac{\varphi}{\alpha \gamma \zeta + (1 - \alpha \zeta) \beta}}. \quad (A3)$$

As a numerical example, let $\alpha = \beta = 0.6$; $\delta = 1.7315102$; $\gamma = 1.2$; $\varphi = 1.0266668$; $\mu = 0.110428$; $\pi = 1.25$; $\rho = 0.3338012$; $\sigma = 1$; $\zeta = 0.9$; $\xi = \hat{e} = 0.8$; $\hat{\omega} = 1.4$. In this case, one can check that there exist three steady state levels of social capital and that two of these are locally stable ($\bar{K}' = 0.9$, $\bar{K}'' = 1.1$). The fact that the

fixed points of (A3) satisfying $\bar{K} \geq 0$ can be at most three can be verified by considering that

$\frac{d^3 k(K_t)}{dK_t^3} < 0$ for $\bar{K} \geq 0$. In addition, one can check that ($\bar{K}' = 0.9$, $\bar{K}'' = 1.1$) are locally stable by

verifying that $0 < \frac{dk(K_t)}{dK_t} < 1$ both at $K_t = \bar{K}' = 0.9$ and at $K_t = \bar{K}'' = 1.1$.

To verify that $u(\bar{x}', \bar{N}', \bar{q}', \bar{e}', \bar{L}', \bar{S}'; \bar{\eta}') > u(\bar{x}'', \bar{N}'', \bar{q}'', \bar{e}'', \bar{L}'', \bar{S}''; \bar{\eta}'')$ and

$u(\bar{x}', \bar{N}'', \bar{q}'', \bar{e}'', \bar{L}'', \bar{S}''; \bar{\eta}'') > u(\bar{x}'', \bar{N}', \bar{q}', \bar{e}', \bar{L}', \bar{S}'; \bar{\eta}')$, consider that

$$u(\bar{x}', \bar{N}', \bar{q}', \bar{e}', \bar{L}', \bar{S}'; \bar{\eta}') - u(\bar{x}'', \bar{N}'', \bar{q}'', \bar{e}'', \bar{L}'', \bar{S}''; \bar{\eta}'') = (\bar{N}')^\alpha + (\bar{q}')^\beta - \bar{L}' \bar{\eta}' (\bar{e}')^\gamma - (\bar{N}'')^\alpha - (\bar{q}'')^\beta + \bar{L}'' \bar{\eta}'' (\bar{e}'')^\gamma =$$

$$= 0.038359 > 0; \text{ and that similarly } u(\bar{x}', \bar{N}'', \bar{q}'', \bar{e}'', \bar{L}'', \bar{S}''; \bar{\eta}'') - u(\bar{x}'', \bar{N}', \bar{q}', \bar{e}', \bar{L}', \bar{S}'; \bar{\eta}') =$$

$$= (\bar{N}'')^\alpha + (\bar{q}'')^\beta - \bar{L}'' \bar{\eta}'' (\bar{e}'')^\gamma - (\bar{N}')^\alpha - (\bar{q}')^\beta + \bar{L}' \bar{\eta}' (\bar{e}')^\gamma = 0.0022394 > 0.$$

2 The equilibrium path under non-ideological policy makers

Given (31a), (31b), (A1) and (A2), $K(K_t, \tau_t)$ can be rewritten as

$$K(K_t, \tau_t) = \mu + \rho K_t \left(1 - \frac{K_t}{\sigma}\right) + \delta \left\{ \left[\frac{\alpha \gamma \zeta}{\beta} \left(\frac{\beta K_t^\pi}{\gamma \zeta (1 - \tau_t)} \right)^{\alpha \zeta} \right] \left[\left(\frac{\alpha K_t^\pi}{(1 - \tau_t)} \right)^{\zeta \beta} \left(\frac{\beta}{\alpha \gamma \zeta} \right)^{\zeta \gamma} \right] \right\}^{\frac{\varphi}{\alpha \gamma \zeta + (1 - \alpha \zeta) \beta}}. \quad (A4)$$

In the presence of non-ideological policy makers, one has $\tau_t = \tau^* \forall t$, where τ^* is given by (35).

As a numerical example, let $\alpha = \beta = 0.6$; $\delta = 1.7283193$; $\gamma = 1.2$; $\varphi = 1.0266668$; $\mu = 0.110428$; $\pi = 1.25$; $\rho = 0.3338012$; $\sigma = 1$; $\zeta = 0.9$; $\xi = \hat{\epsilon} = 0.8$; $\hat{\omega} = 1.4$. Given these parameter values, one has $\tau^* = 0.00153608$.

Moreover, also in this case one can check that there exist three steady state levels of social capital and that two of these are locally stable ($\bar{K}^o = 0.9, \bar{K}^{oo} = 1.1$). The fact that the fixed points of (A4) satisfying

$\bar{K} \geq 0$ can be at most three can be verified by considering that $\frac{\partial^3 K(K_t, \tau^*)}{\partial K_t^3} < 0$ for $\bar{K} \geq 0$. Again, one

can check that ($\bar{K}^o = 0.9, \bar{K}^{oo} = 1.1$) are locally stable by verifying that $0 < \frac{\partial K(K_t, \tau^*)}{\partial K_t} < 1$ both at

$K_t = \bar{K}^o = 0.9$ and at $K_t = \bar{K}^{oo} = 1.1$.

Finally, one can verify that $u(\bar{x}^o, \bar{N}^o, \bar{q}^o, \bar{e}^o, \bar{L}^o, \bar{S}^o; \bar{\eta}^o) - u(\bar{x}^{oo}, \bar{N}^{oo}, \bar{q}^{oo}, \bar{e}^{oo}, \bar{L}^{oo}, \bar{S}^{oo}; \bar{\eta}^o) = (\bar{N}^o)^\alpha + (\bar{q}^o)^\beta - \bar{L}^o \bar{\eta}^o (\bar{e}^o)^\gamma - (\bar{N}^{oo})^\alpha - (\bar{q}^{oo})^\beta + \bar{L}^{oo} \bar{\eta}^{oo} (\bar{e}^{oo})^\gamma = 0.038661 > 0$; and that similarly

$u(\bar{x}^{oo}, \bar{N}^{oo}, \bar{q}^{oo}, \bar{e}^{oo}, \bar{L}^{oo}, \bar{S}^{oo}; \bar{\eta}^{oo}) - u(\bar{x}^o, \bar{N}^o, \bar{q}^o, \bar{e}^o, \bar{L}^o, \bar{S}^o; \bar{\eta}^o) = (\bar{N}^{oo})^\alpha + (\bar{q}^{oo})^\beta - \bar{L}^{oo} \bar{\eta}^{oo} (\bar{e}^{oo})^\gamma - (\bar{N}^o)^\alpha - (\bar{q}^o)^\beta + \bar{L}^o \bar{\eta}^o (\bar{e}^o)^\gamma = 0.0020214 > 0$.

3 The equilibrium path under ideological policy makers

One can solve the intertemporal problem of the ideological policy maker by maximizing

$$\sum_{i=t}^{\infty} \theta^{i-t} \left\{ - \left[\Psi(\tau_i - \tau^*)^2 + (1 - \Psi)(\eta_i - \eta^*)^2 \right] - \chi_i \left[r^{-1}(\eta_{i+1}) - \mu - \rho r^{-1}(\eta_i) \left(1 - \frac{r^{-1}(\eta_i)}{\sigma} \right) - m([L(\eta_i, \tau_i)]^\zeta, Z(\eta_i, \tau_i)) \right] \right\}$$

with respect to τ_t , η_{t+1} and χ_t , and then by eliminating the multiplier χ_t , thus obtaining (37) and (38).

Therefore, along an optimal path the policy maker must satisfy (37), (38) and the transversality condition

$$\lim_{t \rightarrow \infty} \frac{\theta^t 2\Psi(\tau_t - \tau^*)\eta_t}{m_N \zeta L_t^{\zeta-1} \frac{\partial L(\eta_t, \tau_t)}{\partial \tau_t} + m_q \frac{\partial Z(\eta_t, \tau_t)}{\partial \tau_t}} = 0. \quad (A5)$$

At steady state, equations (37) and (38) become

$$\Theta(\eta, \tau) = -\theta(1 - \Psi)(\eta - \eta^*) - \frac{\Psi(\tau - \tau^*) \frac{dr^{-1}(\eta)}{d\eta}}{m_N \zeta L^{\zeta-1} \frac{\partial L(\eta, \tau)}{\partial \tau} + m_q \frac{\partial Z(\eta, \tau)}{\partial \tau}} +$$

$$+\frac{\theta\Psi(\tau-\tau^*)\left[\frac{dr^{-1}(\eta)}{d\eta}\left(1-\frac{2r^{-1}(\eta)}{\sigma}\right)\rho+m_N\zeta L^{\zeta-1}\frac{\partial L(\eta,\tau)}{\partial\eta}+m_q\frac{\partial Z(\eta,\tau)}{\partial\eta}\right]}{m_N\zeta L^{\zeta-1}\frac{\partial L(\eta,\tau)}{\partial\tau}+m_q\frac{\partial Z(\eta,\tau)}{\partial\tau}}=0, \quad (\text{A6})$$

$$\Gamma(\eta,\tau)=r^{-1}(\eta)-\mu-\rho r^{-1}(\eta)\left(1-\frac{r^{-1}(\eta)}{\sigma}\right)-m([L(\eta,\tau)]^\zeta,Z(\eta,\tau))=0. \quad (\text{A7})$$

Let $(\bar{\eta}^{\bullet\bullet}, \bar{\tau}^{\bullet\bullet})$ be a pair of values of η and τ that solve (A6)-(A7) and are such that $\bar{\eta}^{\bullet\bullet} \in (\bar{\eta}^{\circ\circ} - \varepsilon, \bar{\eta}^{\circ\circ} + \varepsilon)$ and $\bar{\tau}^{\bullet\bullet} \in (\tau^* - \varepsilon, \tau^* + \varepsilon)$ (see figure 2). To verify that $\eta^* < \bar{\eta}^{\circ\circ}$ implies that $\eta^* < \bar{\eta}^{\bullet\bullet} < \bar{\eta}^{\circ\circ}$ and $\bar{\tau}^{\bullet\bullet} > \tau^*$ (or alternatively, to verify that $\eta^* > \bar{\eta}^{\circ\circ}$ implies that $\eta^* > \bar{\eta}^{\bullet\bullet} > \bar{\eta}^{\circ\circ}$ and $\bar{\tau}^{\bullet\bullet} < \tau^*$), consider that the local stability of $\bar{K}^{\circ\circ}$ entails

$$\frac{\partial\eta}{\partial\tau} = \frac{-\frac{\partial\Gamma(\eta,\tau)}{\partial\tau}}{\frac{\partial\Gamma(\eta,\tau)}{\partial\eta}} = \frac{m_q\frac{\partial Z(\eta,\tau)}{\partial\tau}}{\frac{dr^{-1}(\eta)}{d\eta} - \frac{dr^{-1}(\eta)}{d\eta}\left(1-\frac{2r^{-1}(\eta)}{\sigma}\right)\rho - m_N\zeta L^{\zeta-1}\frac{\partial L(\eta,\tau)}{\partial\eta} - m_q\frac{\partial Z(\eta,\tau)}{\partial\eta}} < 0 \text{ if evaluated at } \eta = \bar{\eta}^{\circ\circ} = r(\bar{K}^{\circ\circ}) \text{ and } \tau = \tau^*. \quad (\text{A8})$$

Given (A8), consider that $\bar{\tau}^{\bullet\bullet} \in (\tau^*, \tau^* + \varepsilon)$ entails $\bar{\eta}^{\bullet\bullet} \in (\bar{\eta}^{\circ\circ} - \varepsilon, \bar{\eta}^{\circ\circ})$ (or alternatively, consider that $\bar{\tau}^{\bullet\bullet} \in (\tau^* - \varepsilon, \tau^*)$ entails $\bar{\eta}^{\bullet\bullet} \in (\bar{\eta}^{\circ\circ}, \bar{\eta}^{\circ\circ} + \varepsilon)$), and that

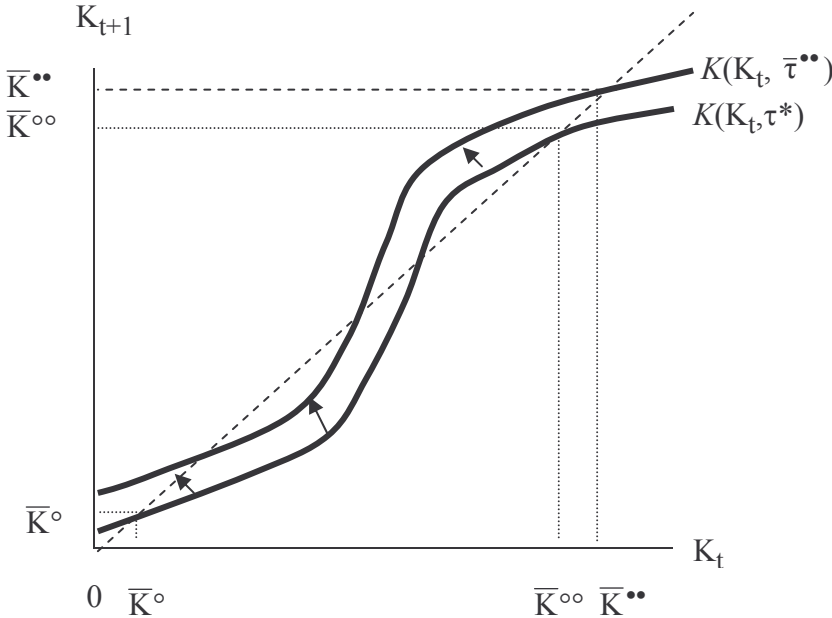
$$\frac{\partial\eta}{\partial\tau} = \frac{-\frac{\partial\Gamma(\eta,\tau)}{\partial\tau}}{\frac{\partial\Gamma(\eta,\tau)}{\partial\eta}} = \frac{m_q\frac{\partial Z(\eta,\tau)}{\partial\tau}}{\frac{dr^{-1}(\eta)}{d\eta} - \frac{dr^{-1}(\eta)}{d\eta}\left(1-\frac{2r^{-1}(\eta)}{\sigma}\right)\rho - m_N\zeta L^{\zeta-1}\frac{\partial L(\eta,\tau)}{\partial\eta} - m_q\frac{\partial Z(\eta,\tau)}{\partial\eta}} < 0 \text{ if evaluated at } \eta = \bar{\eta}^{\bullet\bullet} = r(\bar{K}^{\bullet\bullet}) \text{ and } \tau = \bar{\tau}^{\bullet\bullet}. \quad (\text{A9})$$

By inspecting (A6), one can verify that it follows from (A9) that $\eta^* \begin{cases} > \\ < \end{cases} \bar{\eta}^{\bullet\bullet}$ whenever $\tau^* \begin{cases} > \\ < \end{cases} \bar{\tau}^{\bullet\bullet}$.

The same procedure can be applied to verify that the steady-state pair $(\bar{\eta}^\bullet, \bar{\tau}^\bullet)$ satisfies $\eta^* < \bar{\eta}^\bullet < \bar{\eta}^\circ$ and $\bar{\tau}^\bullet > \tau^*$ (or alternatively, to verify that it satisfies $\eta^* > \bar{\eta}^\bullet > \bar{\eta}^\circ$ and $\bar{\tau}^\bullet < \tau^*$).

As a numerical example, take the parameter values given in the case of non-ideological policy makers and add $\theta=0.5$; $\psi=0.9$, and $\eta^*=0.8741666 < \bar{\eta}^{\circ\circ} = r(\bar{K}^{\circ\circ}) = 0.8876855$. Given these parameter values, one obtains $\bar{\eta}^{\circ\circ} > \bar{\eta}^{\bullet\bullet} = 0.8742684 > \eta^*$ and $\bar{\tau}^{\bullet\bullet} = 0.00155 > \tau^*$. Linearizing the system consisting of (37) and (38) about $(\bar{\eta}^{\bullet\bullet} = 0.8742684, \bar{\tau}^{\bullet\bullet} = 0.00155)$, one can derive the following characteristic equation: $\phi^2 - 3.1706696\phi + 1.9999711 = 0$, where $\phi_1 = 0.8688747$ and $\phi_2 = 2.3017948$ are the solving characteristic roots, implying saddle-path stability.

FIGURE 2
Phase line of eq. (32) under non-ideological and ideological policy makers ($\bar{\tau}^{\bullet\bullet} > \tau^*$)



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