DISCUSSION PAPER SERIES

IZA DP No. 7888

Employment Dynamics and Redistributive Policies under Workers' Social Norms

Rodolphe Dos Santos Ferreira
Teresa Lloyd-Braga
Leonor Modesto

January 2014

Forschungsinstitut
zur Zukunft der Arbeit
Institute for the Study
of Labor

Employment Dynamics and Redistributive Policies under Workers' Social Norms

Rodolphe Dos Santos Ferreira
BETA, University of Strasbourg
and Institut Universitaire de France

Teresa Lloyd-Braga
Católica Lisbon School of Business and Economics

Leonor Modesto
Católica Lisbon School of Business and Economics
and IZA

Discussion Paper No. 7888
January 2014

IZA

P.O. Box 7240
53072 Bonn
Germany

Phone: +49-228-3894-0
Fax: +49-228-3894-180
E-mail: iza@iza.org

IZA Discussion Paper No. 7888
January 2014

ABSTRACT

Employment Dynamics and Redistributive Policies under Workers' Social Norms*

We study employment dynamics using an OLG model with unemployment benefits and universal old-age survival pensions, both financed by taxing employed workers. The novelty is that we explicitly introduce workers' social norms that shape both the individual participation decision of workers and wage bargaining. We find that social norms increase the likelihood of multiplicity of equilibria and somewhat facilitate the emergence of indeterminacy and flip bifurcations, constituting therefore a source of business cycles driven by self-fulfilling volatile expectations, *i.e.* sunspots. We also find that, in the presence of strong social norms, standard policy recommendations that advocate a decrease in unemployment benefits in order to boost employment are no longer valid. Indeed, our simulation results show that the opposite will happen for empirically plausible levels of the unemployment rate.

JEL Classification: E32, H23, H31, J65

Keywords: flip bifurcations, local indeterminacy, steady state multiplicity, sunspots, workers' social norms, unemployment benefits

Corresponding author:

Leonor Modesto
Católica Lisbon School of Business and Economics
Palma de Cima
1649-023 Lisboa
Portugal
E-mail: lrm@ucp.pt

* Financial support from FCT under the PTDC/EGE-ECO/103468/2008 is gratefully acknowledged. We thank participants of annual conferences SAET 2013, held at MINES ParisTech, and PET 2013, held in Católica-Lisbon, for useful comments.

1 Introduction

In this paper we study the influence of workers' social norms on the occurrence of steady state multiplicity, bifurcations and indeterminacy, in a model with indivisible labour, wage bargaining and unemployment, where redistributive policies are pursued by the government.

Redistribution, due to equity considerations, has always been an important goal of government intervention. A more equitable distribution of income (or wealth) also contributes to social and political stability, favoring economic growth and employment.[1] However, redistributive policies affect agents' incentives, distorting decisions and allocations, and may thereby reduce economic efficiency, possibly retarding growth and increasing unemployment. Moreover, economic incentives should not be taken independently of the *social norms* that constrain or shape individual behaviour (Akerlof, 1980, Lindbeck *et al.*, 1999). Unemployment is a source of economic inequality to be corrected through the kind of redistributive policies on which we want to concentrate in this paper. Welfare benefits, transferring to the unemployed the tax revenue obtained from the employed, are clearly a disincentive to labour market participation. This disincentive is however constrained by the social norm to live off one's work, a norm which depends upon the number of transfer recipients: "living on transfers becomes relatively less embarrassing when more individuals do likewise" (Lindbeck *et al.*, 1999, p.3). This interaction creates a positive *participation externality* which may significantly modify the effects of these redistributive policies on steady state employment and employment dynamics.

The mechanism introduced through this positive externality is similar to the one working through the so-called *leisure externalities*, when positive (Benhabib and Farmer, 2000, Weder, 2004, Duernecker, 2008, Gómez, 2008, Pintea, 2010, Barbar, 2010, Azariadis *et al.*, 2012). However, leisure externalities affect the division of the individual's time endowment into work and leisure, and are typically justified as "the effect of coordination spillovers in communal leisure activities" (Weder, 2004, p.2) or as the result of social representations ("workaholism" vs. conspicuous idleness), where the frontier between work and leisure appears essentially as a matter of degree. By contrast, the participation externality we consider in this paper affects the

[1] Alesina and Rodrick (1994) and Persson and Tabellini (1994) find empirical support for this last claim.

discrete decision to work or not to work (with the consequent loss of a social status). Moreover, the studies resorting to leisure externalities have ruled out unemployment, which is an essential ingredient of the participation externality, since the stigma of not living off one's work weakens as the rate of unemployment increases.

There is empirical support for the existence and the role of labour related social norms, in particular to live off one's own work, rather than on living off welfare benefits. Some authors talk about the stigma associated with the unemployment status and, more significantly, most empirical studies find that this stigma, or psychological cost, weakens when there is an increase in the number of unemployed individuals. For instance, Clark (2003), using data from the British Household Panel Survey, concludes that "unemployment always hurts, but it hurts less when there are more unemployed people around" (p.346). Moreover, Cörvers and Golsteyn (2004), analyzing non-working men's willingness to work in the Netherlands, between 1994 and 2000, found that this willingness increased in an upswing due to social pressure. Hedström *et al.* (2003), using Swedish data of the 1990s, also found that a higher unemployment level among peers decreased considerably the transition rates out of unemployment.

We want to examine the effects of workers's social norms on employment dynamics and on the performance of redistributive policies. Like most studies on redistribution in dynamic models, our analysis is carried out in the context of an overlapping generations (OLG) model, which allows us to easily introduce intergenerational redistribution and life time decisions in a dynamic model with unemployment. The novelty is that we explicitly introduce in this framework workers' social norms that shape both the individual participation decision of workers and wage bargaining. Workers' social norms influencing the participation are here represented by an utility cost of being unemployed which is defined by two relevant parameters: one parameter measures the disutility level when everyone is following the norm and the other measures the responsiveness of the disutility to the proportion of norm adherents. We consider unemployment benefits and old age survival pensions, both financed by taxing employed workers. We find that social norms increase the likelihood of multiplicity of equilibria (as in Lindbeck *et al.*, 1999, or Kolm, 2005). We also find that workers' social norms, creating a positive participation externality, facilitate the emergence of local indeterminacy and

of flip bifurcations[2] for plausible values of the unemployment rate, constituting therefore a source of business cycles driven by self-fulfilling volatile expectations, *i.e.* sunspots. This result is new and in accordance with those obtained by Lloyd-Braga et al. (2011), stating that "under labour market distortions (...) indeterminacy and bifurcations occur for empirically relevant values of the parameters" (p.2), and pointing to labour market imperfections as the most likely source of endogenous business cycles.

We also find that, in the presence of strong social norms, standard policy recommendations that advocate a decrease in unemployment benefits in order to boost employment are no longer valid.[3] Grandmont (2008) has also shown that increasing unemployment insurance is beneficial to employment, while increasing the likelihood of local indeterminacy of the steady state, itself a source of dynamic inefficiencies. We want to emphasise that such inefficiencies, as well as the reversal of the policy prescriptions, result in our model from strong employment social norms**,** and not, as in Grandmont's efficiency wage model, from the redistribution policy. The two models are however related. Indeed, as already noted, our model is based on a mechanism similar to the one of the model with leisure externalities, itself shown to be equivalent to the model with unemployment insurance and efficiency wages (see Lloyd-Braga *et al.*, 2011, Proposition 8).

The rest of the paper is organised as follows. In section 2 we present the model we are going to use, and establish the temporary equilibrium equation for employment. In section 3 we take the unemployment benefit as the sole government subsidy, and formulate the deterministic perfect foresight employment dynamics. We then examine the existence and multiplicity of steady states and analyze local dynamics, under weak and strong social norms. We end the section with a discussion of the obtained results, with some comments on policy implications. In section 4, we assume that universal old-age pensions are the sole government subsidy and briefly repeat our previous analysis, again under weak and strong social norms. Finally, in section 5 we formulate some concluding remarks.

[2]Notice that, as referred above, the participation externality operates in a similar way as the leisure externalities, which are well known to facilitate indeterminacy (see Benhabib and Farmer, 2000, Weder, 2004, Barbar, 2010). However, as it will appear in the following, this is true, in the case of leisure externalities as in the case of social norms, only as far as the response to others' leisure or unemployment remains moderate.

[3]Indeed, our simulation results show that the opposite will happen for empirically plausible levels of the unemployment rate.

2 The model

We refer to a simple overlapping generations economy, where a continuum of size one of identical households lives for 2 periods, working and saving when young and consuming when old. In this economy there is another continuum (also of size one) of identical firms, which employ young households to produce a single consumer good, used as numeraire and sold in a perfectly competitive market. Wages are bargained between workers and firms but firms choose employment unilaterally. Firm ownership is represented by a fixed number of shares (again normalised to one), which constitute the sole asset in this economy. We finally consider a government limiting its activity to the pursuit of redistributive targets. In particular we consider that the government aim is simply to guarantee a minimum level of consumption to every (old) consumer.

2.1 The government

For simplicity, all taxes and subsidies are taken to be set by the government (on real terms) on a *per capita* basis. We denote by T the tax on employed workers, by B the unemployment benefit and by R the universal old-age survival pension. Denoting by l the employment level, the government budget constraint at time t can be stated as follows:

$$B_t (1 - l_t) + R_t = T_t l_t. \tag{1}$$

2.2 Households

As the whole of household's income is devoted to the consumption of a unique good in a single period of life, and as we assume indivisible labour, the sole decision left to the household concerns its participation in the labour market: the young household at time t ($t = 0, 1, ...$) has indeed to decide whether to accept ($e_t = 1$) or to refuse ($e_t = 0$) some job offered at real wage w_t, so as to maximise under the budget constraint the expected value $V(e_t)$ of its decision. We assume, as usual, that work generates some positive disutility v (expressed in terms of consumption), but we also assume that the unemployment status is itself a source of disutility, even when unemployment is voluntary, that is, when e_t is freely chosen to be zero and is not imposed by rationing. Furthermore, we assume that the status of unemployed is harder

and harder to bear as it becomes less and less "normal", that is, as it gets farther and farther away from the *social norm* (Lindbeck *et al.*, 1999, Clark, 2003). More precisely, the disutility generated by the unemployment status is increasing, and at a non-decreasing rate, with the proportion $\bar{l}_t$ of currently employed households.[4] For simplicity, we specify this disutility as $s\bar{l}_t^{\sigma}$, where the parameter $s \in (0, v)$ fixes the disutility level when everyone is following the norm ($\bar{l}_t = 1$), and the parameter $\sigma \in [1, \infty)$ measures the responsiveness of the disutility to the proportion of norm adherents. We can now define the expected participation value as

$$V(e_t) \equiv \max_{c_{t+1} \in \mathbb{R}_+} E_t(c_{t+1}) - \left(ve_t + s\bar{l}_t^{\sigma}(1 - e_t)\right) \tag{2}$$
$$\text{s.t. } c_{t+1} \leq \frac{(w_t - T_t)e_t + B_t(1 - e_t)}{q_t}(q_{t+1} + P_{t+1}) + R_{t+1},$$

where E_t denotes the mathematical expectation operator (conditional on information available at t), c the amount of consumption, T, B, and R the government decision variables as already defined, q the real price of one share, and P the real profit per share. The ratio on the RHS of the budget constraint represents the number of shares bought by the young household. It is multiplied by the future net value of each share, dividends included.

For the young household to decide to participate in the labour market, $V(1)$ must be at least as large as $V(0)$, with

$$V(1) = (w_t - T_t)\frac{E_t(q_{t+1} + P_{t+1})}{q_t} + E_t(R_{t+1}) - v \tag{3}$$
$$V(0) = B_t\frac{E_t(q_{t+1} + P_{t+1})}{q_t} + E_t(R_{t+1}) - s\bar{l}_t^{\sigma}, \tag{4}$$

that is, the real wage w_t must be at least as large as the reservation wage

$$\overline{w}_t = B_t + T_t + \left(v - s\bar{l}_t^{\sigma}\right)\frac{q_t}{E_t(q_{t+1} + P_{t+1})}, \text{ with } 0 < \bar{l}_t \leq 1 < \frac{v}{s}, \tag{5}$$

where the ratio $q_t / E_t(q_{t+1} + P_{t+1})$ can be seen as the reciprocal of the expected real interest factor. As expected, from the individual point of view, the reservation wage is an increasing function of the unemployment benefit

[4] This assumption is corroborated by empirical findings. See Clark (2003), Cörvers and Golsteyn (2004), and Hedström *et al.* (2003).

and the *per capita* tax. Because of the social norm, it is also a decreasing function of employment, which in this way influences positively the willingness to work. It does not depend *directly* upon the old-age survival pension, applying universally to seniors irrespectively of their employment status when they were young. However, as shown below, the survival pension does influence the reservation wage through several general equilibrium channels.

2.3 Firms

Wages are bargained between workers and firms but, after the determination of the real wage w_t, the representative firm sets the level l_t of employment in order to maximise its profit, $P_t = l_t^{\alpha} - w_t l_t$, with labour l_t as the only argument of the production function (with $0 < \alpha < 1$). The profit maximizing level of employment is given by the first order condition:

$$l_t = (\alpha / w_t)^{1/(1-\alpha)} . \tag{6}$$

The corresponding profit is

$$P_t = (1-\alpha)(\alpha / w_t)^{\alpha/(1-\alpha)} . \tag{7}$$

2.4 Wage bargaining

Wage negotiations between workers and firms are also shaped by social norms (Akerlof, 1980, Elster, 1989). These norms reflect in particular the equity principle "Equal pay for equal work" and the principle of fair division of the surplus between the parties, guaranteeing workers' participation.[5] As usual in this context, we refer to the 'generalised' Nash solution to the following bargaining problem, a convenient tool to take these social norms into account:

$$\max_{w_t \in \mathbb{R}_+} \left\{ (V(1, w_t) - V(0, w_t))^{\theta} \left((1-\alpha)(\alpha / w_t)^{\alpha/(1-\alpha)} \right)^{1-\theta} \right\}, \tag{8}$$

where $V(0, w_t)$ and 0 are the worker's and the firm's fallbacks, respectively. The parameter $\theta \in (0, 1)$ denotes the worker's relative weight in the bargaining according to the prevailing social norms.

[5] For empirical support, see Elster (1989), who discusses the role of social norms of equality, equity and fair division in bargaining between unions and employers, using the Swedish labor market as an example. Also, Akerlof and Yellen (1984) present evidence that supports the equity principle in wage contracts.

By equations (3), (4) and (5), the solution to this problem is given by

$$w_t = \arg \max_{w \in [\overline{w}_t, \infty)} \left\{ (w - \overline{w}_t)^{\theta} w^{-(1-\theta)\alpha/(1-\alpha)} \right\}. \tag{9}$$

If $\theta \geq \alpha$, no solution exists, since the objective function is always increasing in w. If $\theta = 0$, the fair wage coincides with the reservation wage $\overline{w}_t$. We assume that $0 < \theta < \alpha$, obtaining:

$$w_t = \frac{(1-\theta)\,\alpha}{\alpha - \theta} \overline{w}_t \equiv \mu \overline{w}_t, \tag{10}$$

with the markup factor $\mu > 1$. In the following, we shall focus on unemployment equilibria with $l_t < 1$ (avoiding corner solutions), by assuming that $\mu \overline{w}_t > \alpha$ (see (6) and (10)).

2.5 Equilibrium

There are three markets in this economy, corresponding to the three goods: output, labour and shares. By Walras' law, we can ignore the last one, and use the equilibrium condition in the output market (that output demand, or the seniors' real wealth $q_t + (1-\alpha)\, l_t^{\alpha} + R_t$, be equal to output supply l_t^{α}) to determine the share price:

$$q_t = \alpha l_t^{\alpha} - R_t. \tag{11}$$

In the following we shall use the restriction $R_t < \alpha l_t^{\alpha}$, ensuring a positive share price.

By inserting q_t as given by equation (11) and P_t given by equation (7) in the labour market equilibrium condition $l_t = \left(\alpha / \mu \overline{w}_t\right)^{1/(1-\alpha)} < 1$, with the reservation wage $\overline{w}_t$ defined by equation (5) for $\overline{l}_t = l_t$, we obtain the temporary equilibrium equation which implicitly determines the level of current employment l_t given expected output $E_t\left(l_{t+1}^{\alpha}\right)$:

$$l_t = \left[\frac{\mu}{\alpha} \left(B_t + T_t + (v - s l_t^{\sigma}) \frac{\alpha l_t^{\alpha} - R_t}{E_t\left(l_{t+1}^{\alpha}\right) - E_t\left(R_{t+1}\right)} \right) \right]^{-1/(1-\alpha)}. \tag{12}$$

In the following, we will take taxes T_t as an adjustment variable to be determined by the government budget constraint. If we further assume constancy of all other government decision variables, equation (12) may be taken as defining a deterministic one-dimensional autonomous dynamic system

characterizing perfect foresight equilibria in this economy (with $E_t\left(l_{t+1}^{\alpha}\right) = l_{t+1}^{\alpha}$). A steady state $l = l_t = l_{t+1}$ is then given by

$$l = \left[\frac{\mu}{\alpha}\left(B + R + (v - sl^{\sigma})\frac{\alpha l^{\alpha} - R}{l^{\alpha} - R}l\right)\right]^{1/\alpha}. \tag{13}$$

Although our aim is to study an economy with redistributive policies and workers' social norms, our model covers as a limit case the situation where there is no redistributive policy and no social norm of employment. In order to ensure the existence, in that case, of a non autarkic steady state $l = (\mu v)^{-1/(1-\alpha)} \in (0,1)$, we shall assume that $\mu v > 1$.

To better understand the specific role of each one of the two alternative subsidies introduced in our model we shall now analyze separately their effects. Before starting that analysis, let us however recall the assumptions on the parameters made so far:

Assumptions

1. $0 < s < v$ and $\sigma \geq 1$.
2. $0 < \theta < \alpha < 1 \Longrightarrow \mu \equiv \frac{(1-\theta)\alpha}{\alpha-\theta} > 1$.
3. $\mu v > 1$.
4. $B < \alpha/\mu$ and $R < \alpha/\mu$.

The last assumption, bounding from above the two alternative subsidies, will allow us to obtain in both cases well-defined perfect foresight dynamics.

3 Unemployment benefit

We assume in this section that the unemployment benefit is the sole government subsidy, taken as a constant.

3.1 Perfect foresight dynamics

For any t, take $R_t = 0$ and $B_t = B > 0$ in equation (12). Also, using the government budget constraint (1) to replace the tax on employed workers

$T_t = B\left(1/l_t - 1\right)$ in this equation, we obtain:

$$l_t = \left[\frac{\mu}{\alpha}\left(\frac{B}{l_t} + \left(v - sl_t^{\sigma}\right)\alpha\frac{l_t^{\alpha}}{E_t\left(l_{t+1}^{\alpha}\right)}\right)\right]^{-1/(1-\alpha)}, \tag{14}$$

where we find in large round brackets a general equilibrium expression for the reservation wage. The existence of unemployment benefits and of an employment social norm introduces the terms B/l_t and $-sl_t^{\sigma}$, respectively, in the expression for the reservation wage, which may consequently be decreasing in l_t. Thus, given the output expectation $E_t\left(l_{t+1}^{\alpha}\right)$ at period t, equation (14) may have multiple solutions, that is, there may exist multiple temporary equilibria.

Also, the variability of expectations across periods opens the way, through the induced variability of the reservation wage, to the existence of employment fluctuations. These expectations can be self-fulfilling, in the context of intertemporal equilibrium. Under perfect foresight, and under Assumption 4 ($B < \alpha/\mu$), we may obtain a *deterministic* forward dynamic system by just reformulating the temporary equilibrium condition (14):

$$l_{t+1} = l_t\left(\frac{\mu\left(v - sl_t^{\sigma}\right)l_t}{l_t^{\alpha} - \mu B/\alpha}\right)^{1/\alpha} \equiv f\left(l_t\right) \text{ for } l_t \in \left(\left(\mu B/\alpha\right)^{1/\alpha}, 1\right). \tag{15}$$

In addition, we know that intertemporal equilibria with *stochastic* endogenous fluctuations driven by volatile self-fulfilling expectations exist in the neighborhood of indeterminate steady states of this deterministic system (see for instance Grandmont *et al.*, 1998, and Benhabib and Farmer, 1999).

3.2 Steady states

A steady state $l = f\left(l\right)$ of system (15) is a solution to the equation:

$$\phi\left(l\right) \equiv l^{\alpha} - \mu\left(v - sl^{\sigma}\right)l = \mu B/\alpha. \tag{16}$$

This equation can be interpreted as the equality of the inverse labour demand $\alpha l^{\alpha-1}$ and the inverse labour supply (the reservation wage augmented by the markup factor) $\mu\left(B/l + \left(v - sl^{\sigma}\right)\alpha\right)$ under static expectations of future output: $E_t\left(l_{t+1}^{\alpha}\right) = l_t^{\alpha}$ (see equation (14)).

In the following, we shall discuss multiplicity and local determinacy of steady states. As concerns the latter property, we know that the steady state $l = f\left(l\right)$ is *locally determinate* if

$$f'(l) = \frac{f'(l)\,l}{f(l)} = \frac{v-(1+\sigma)\,sl^{\sigma}}{\alpha\,(v-sl^{\sigma})} - \frac{\mu B/\alpha}{l^{\alpha}-\mu B/\alpha} \in (-\infty,-1)\cup(1,+\infty)\,. \quad (17)$$

Hence, a steady state l^* is determinate if $f(l)/l$ is increasing in l at l^*, which is equivalent to $f'(l^*)\,l^*/f(l^*) > 1$. As l^* is a solution to (16), this inequality is itself equivalent to the condition $\phi'(l^*) < 0$ (since $l^{\alpha} - \mu B/\alpha$ becomes smaller than $\mu(v - sl^{\sigma})\,l$, hence by (15) $f(l)/l$ larger than 1, as l becomes larger than l^*). Thus, $\phi(l^*) = \mu B/\alpha$ and $\phi'(l^*) < 0$ imply determinacy of l^*. By contrast, if $\phi'(l^*) > 0$, we know that $f'(l^*) < 1$, but l^* can in this case be either determinate (if $f'(l^*) < -1$) or indeterminate (if $f'(l^*) > -1$).

As to multiplicity, first notice that, by continuity and since $\phi(0) = 0$, $\phi(1) < \mu B/\alpha$ (resp. $\phi(1) > \mu B/\alpha$) implies an even (resp. uneven) number of steady states. More precisely, we will show that the graph of ϕ can change the sign of its curvature, from concave to convex, at most once in the interval $(0,1)$, so that $\phi(1) < \mu B/\alpha$ in fact implies 0 or 2 steady states, and $\phi(1) > \mu B/\alpha$ implies 1 or 3 steady states. Clearly, existence of 3 steady states requires the graph of ϕ to be N-shaped, implying $\phi'(1) > 0$. If $\phi'(1) < 0$, the graph of ϕ is inverted U-shaped, so that the maximum number of steady states is then 2.

It appears that for a small enough value of s (including zero, when there is no employment social norm at all), $\phi(1) < \mu B/\alpha$, so that there are either 0 or 2 steady states. We will characterise this situation as that of a weak social norm. A strong social norm will naturally denote the reverse situation, leading to the possibility of 1 or 3 steady states. Formally, we introduce the following

Definition 1 *The social norm is said to be a*

a. ***weak social norm*** *iff* $0 \leq s < v - (1 - \mu B/\alpha)/\mu$ *or, equivalently,* $\phi(1) < \mu B/\alpha$*;*

b. ***strong social norm*** *iff* $s > v - (1 - \mu B/\alpha)/\mu$ *or, equivalently,* $\phi(1) > \mu B/\alpha$*.*

Notice that the distinction between weak and strong social norms does not involve the responsiveness σ of the disutility to the proportion of norm adherents, but only the unemployment disutility level s.

3.3 Weak social norm

As just stated, the case of a weak social norm extends to economies without an employment social norm ($s = 0$).

Proposition 1 (Weak social norm) *Consider the case of a weak social norm according to Definition 1a, and further let* $\max_{l\in(0,1)} \phi(l) > \mu B/\alpha$. *Then, there are two steady states, the larger of which is locally determinate and responds negatively to an increase in the unemployment benefit.*[6]

Proof. By (16), $\phi(0) = 0 \leq \mu B/\alpha$ and by the the assumption of a weak social norm and Definition 1a, $\phi(1) < \mu B/\alpha$, so that the number of steady states is even by continuity of ϕ. As $\max_{l\in(0,1)} \phi(l) > \mu B/\alpha$ by assumption, there are at least two steady states. Now, compute:

$$\begin{aligned}
\phi'(l) &= \alpha l^{\alpha-1} - \mu\left(v - (1+\sigma) s l^{\sigma}\right), && (18)\\
\phi''(l) &= -\alpha(1-\alpha) l^{\alpha-2} + \mu(1+\sigma)\sigma s l^{\sigma-1}, && (19)\\
\phi'''(l) &= \alpha(1-\alpha)(2-\alpha) l^{\alpha-3} + \mu(1+\sigma)\sigma(\sigma-1) s l^{\sigma-2} > 0. && (20)
\end{aligned}$$

As $\phi'''(l) > 0$, ϕ'' can change signs at most once in the interval $(0,1)$: ϕ is always concave (recall that $\lim_{l\to 0} \phi''(l) = -\infty$), or else first concave and then convex. So, the graph of ϕ cannot intersect the horizontal line $\mu B/\alpha$ more than twice: there are exactly two steady states. The function ϕ is decreasing at the highest of these two steady states, which is consequently locally determinate and such that employment decreases whenever B increases. ■

In the following two figures, we give an example of existence of two steady states, illustrating Proposition 1.[7] Figure 1 represents the graph of ϕ as well as the horizontal line $\mu B/\alpha$. Clearly, a comparative statics analysis around the higher steady state leads to the standard conclusion that an increase in the unemployment benefit diminishes the equilibrium level of employment. Figure 2, with l_t as the abscissa and l_{t+1} as the ordinate, represents the graph of f, which has two intersections with the first diagonal. The higher steady

[6] The lower steady state can be determinate or indeterminate, depending upon the values of the parameters. We disregard here the formulation of determinacy conditions since this lower steady state, approaching the autarkic state as $B \to 0$, appears empirically implausible for reasonable values of the parameters.

[7] We use the parameter values: $\alpha = 0.75$, $v = 1.2$, $s = 0.2$, $\sigma = 1.6$, $\mu = 1.125$ and $B = 0.02$.

state is clearly determinate, whereas the lower one is indeterminate in this example.

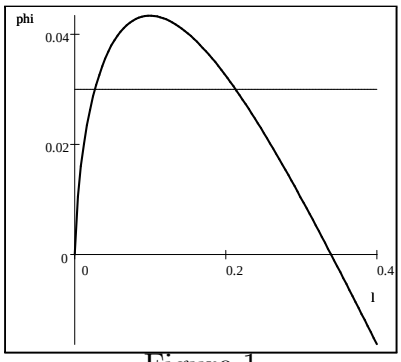

Figure 1

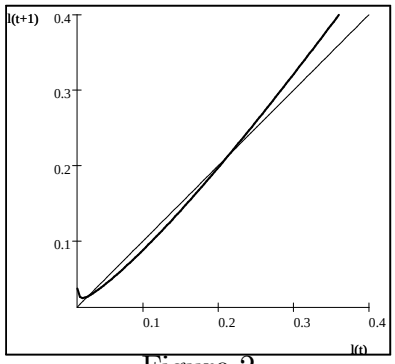

Figure 2

3.4 Strong social norm

Proposition 2 (Strong social norm) *Consider the case of a strong social norm according to Definition 1b, and assume*

$$\frac{v-\alpha/\mu}{1+\sigma} < s < \frac{v}{1+\sigma}\frac{1-\alpha}{\sigma+1-\alpha}\left(\frac{\mu v\sigma}{\alpha\left(\sigma+1-\alpha\right)}\right)^{\sigma/(1-\alpha)}. \tag{21}$$

Further let $\hat{l}$ *and* $\breve{l}$ *be the two critical points of* ϕ*, such that* $0<\hat{l}<\breve{l}<1$ *and such that* $\phi\left(\hat{l}\right)$ *and* $\phi\left(\breve{l}\right)$ *are a local maximum and a local minimum, respectively, and assume:* $\phi\left(\breve{l}\right) < \mu B/\alpha < \phi\left(\hat{l}\right)$*. Then there is a steady state in each one of the three intervals* $\left(0,\hat{l}\right)$*,* $\left(\hat{l},\breve{l}\right)$ *and* $\left(\breve{l},1\right)$*. The middle steady state, in* $\left(\hat{l},\breve{l}\right)$*, responds negatively to an increase in the unemployment benefit* B *and is determinate. The higher steady state, in* $\left(\breve{l},1\right)$*, responds positively to an increase in the unemployment benefit* B *and may be determinate or indeterminate.*

Proof. By (18), $\lim_{l\to 0}\phi'(l)=+\infty$. Also by (18) and by the left inequality in (21), $\phi'(1)>0$. We have shown in the proof of Proposition 1 that ϕ is either concave in the whole interval $(0,1)$, or else concave and then convex. As $\phi'(1)>0$, this means that the graph of ϕ is either overall increasing, or else N-shaped, with a maximum at $\hat{l}$ and a minimum at $\breve{l}$. The former case,

which would lead to the existence of a unique steady state, is however ruled out by the assumption (21). Indeed, by (19) and (20), ϕ' has a minimum when

$$\phi''(l) = -\left(\alpha(1-\alpha) - \mu\sigma(1+\sigma)sl^{\sigma+1-\alpha}\right)l^{\alpha-2} = 0,$$

that is, at

$$\bar{l} = \left(\frac{\alpha(1-\alpha)}{\mu\sigma(1+\sigma)s}\right)^{1/(\sigma+1-\alpha)} < 1,$$

where the inequality results from the lower bound imposed upon s by (21). Using (18) and because of the upper bound imposed upon s by (21), it is straightforward to verify that $\phi'(\bar{l}) < 0$. So, we are left with the case where ϕ has a local maximum at $\hat{l}$ and a local minimum at $\breve{l}$, with $\breve{l} > \hat{l}$. Clearly, there are then three steady states under the assumption on $\mu B/\alpha$ (including that introduced by Definition 1b for a strong social norm). As ϕ is decreasing in the interval $\left(\hat{l}, \breve{l}\right)$, the middle steady state l^*, in this interval, is determinate and responds negatively to an increase in B, like in the weak social norm case. And since ϕ is increasing in the interval $\left(\breve{l}, 1\right)$, the higher steady state l^{**}, in this interval, responds positively to an increase in B. Also, since ϕ is increasing, we know that $f'(l^{**}) < 1$, but local determinacy (resp. indeterminacy) further requires that $f'(l^{**}) < -1$ (resp. $f'(l^{**}) > -1$), so that l^{**} can be either determinate or indeterminate (as the lower steady state, belonging to the interval $\left(0, \hat{l}\right)$ where ϕ is also increasing). ■

Observe that, in order to obtain three steady states, we have imposed in Proposition 2 a lower but also an *upper* bound to parameter s. Should s be larger than this upper bound, the function ϕ would be overall increasing, and we would obtain a unique steady state. Existence of three steady states thus requires a strong yet moderate employment social norm. Another remark concerns the presence of the other parameter, σ, characterizing the employment social norm in its responsiveness to the employment level. Contrary to the definition of a strong social norm, from which this parameter was absent, the two bounds imposed by the assumption of Proposition 2 depend upon it. However, existence of three steady states is not ruled out by a weak value of

σ, namely $\sigma = 1$, the case of a linear specification of the social norm.[8]

In the following two figures, analogous to Figures 1 and 2, we give an example of existence of three steady states, in a case where the higher one is indeterminate.[9] By simple inspection of Figure 3, we see that an increase in the unemployment benefit *increases* the level of employment of the higher steady state. In Figure 4, the lower and the higher steady states appear to be indeterminate, whereas the middle one is determinate.

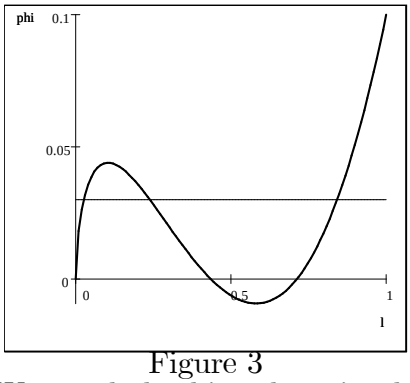

Figure 3

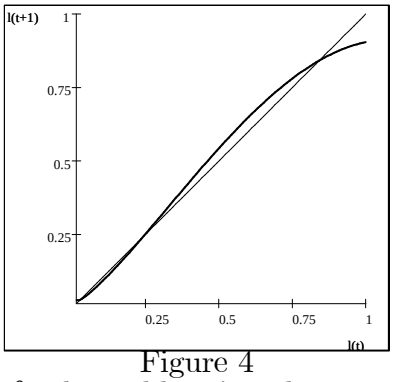

Figure 4

We conclude this subsection by further addressing the question of local determinacy of the higher steady state, $l^{**} \in \left(\breve{l}, 1\right)$. Recall that, under the conditions of Proposition 2, l^{**} is indeterminate if and only if $f'(l^{**}) > -1$. By referring to (16) we can replace $\mu B/\alpha$ by $\phi(l^{**})$ in the expression (17) for $f'(l^{**})$, so that the last inequality appears to be equivalent to

$$\sigma < \frac{(1+2\alpha)(v - sl^{**\sigma}) - (\alpha/\mu) l^{**\alpha-1}}{sl^{**\sigma}} \equiv \overline{\sigma}^{**}. \tag{22}$$

Now, consider concomitant variations of the social norm parameters s and σ that keep constant the disutility $S^{**} \equiv sl^{**\sigma}$ of being unemployed in the steady state l^{**}. Referring to (16), observe that this steady state will not be modified by such concomitant variations of s and σ, provided all other parameters are kept constant. As a consequence, the value $\overline{\sigma}^{**}$ of the RHS of inequality (22) will also be kept unaltered by those variations of the social

[8] The admissible interval imposed on s by the assumption of Proposition 2 for $\sigma = 1$ is never empty, since

$$(1 - \alpha/\mu v)^{1-\alpha} \alpha/\mu v < \frac{(1-\alpha)^{1-\alpha}}{(2-\alpha)^{2-\alpha}}$$

is satisfied for any $\alpha \in (0,1)$ and any $\mu v > 1$.

[9] We use the same parameter values as for Figures 1 and 2, except for $s = 0.4$.

norm parameters. An increase in σ, accompanied by a corresponding increase in s so as to keep $sl^{**\sigma}$ equal to S^{**}, can thus reverse the inequality $\sigma < \overline{\sigma}^{**}$ into $\sigma > \overline{\sigma}^{**}$, *i.e.* $f'(l^{**}) > -1$ into $f'(l^{**}) < -1$. Since $\sigma \geq 1$ and $s < v$ by Assumption 1, this will be possible if $1 < \overline{\sigma}^{**}$ and $S^{**} < vl^{**\overline{\sigma}^{**}}$ (or $\overline{\sigma}^{**} < (\ln S^{**} - \ln v) / \ln l^{**}$). In other words, indeterminacy of the higher steady state l^{**} is then converted into determinacy, through a flip bifurcation occurring when $\sigma = \overline{\sigma}^{**}$ (or $f'(l^{**}) = -1$).

The following proposition summarises this observation.

Proposition 3 (Flip bifurcation) *Under the conditions of Proposition 2, the steady state* $l^{**} \in \left(\breve{l}, 1\right)$ *is indeterminate if and only if* $\sigma < \overline{\sigma}^{**} \equiv ((1+2\alpha)(v - S^{**}) - (\alpha/\mu) l^{**\alpha-1}) / S^{**}$, *with* $S^{**} \equiv sl^{**\sigma}$. *If* $1 \leq \sigma < \overline{\sigma}^{**} < (\ln S^{**} - \ln v) / \ln l^{**}$, *the strengthening of the social norm by the concomitant increase of* s *and* σ *while keeping* S^{**} *constant makes the steady state* l^{**} *undergo a flip bifurcation as* σ *takes the bifurcation value* $\overline{\sigma}^{**}$, *and then makes it determinate, for* $\sigma > \overline{\sigma}^{**}$.

Figure 5 illustrates the reversal of local indeterminacy into local determinacy of the higher steady state of Figure 4 obtained through an increase in s and σ that keeps S^{**} constant. The thin curve, increasing at the higher steady state with a slope smaller than 1, corresponds to the case of local indeterminacy and is the same as in Figure 4. The thick curve, decreasing at the higher steady state with a slope smaller than -1, corresponds to the case of local determinacy.[10]

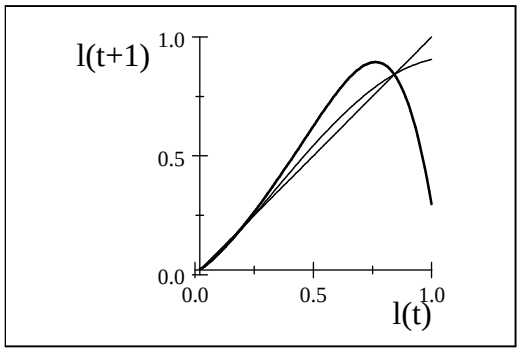

Figure 5

[10] It is obtained with the same parameter values as for Figure 4, except for $s = 0.85$ and $\sigma = 6$ (instead of $s = 0.4$ and $\sigma = 1.6$).

Proposition 3 together with Figure 5 also show that local indeterminacy prevails, with a plausible value of the unemployment rate, for a strong yet moderate value of s (as under Proposition 2), but also for a moderate value of $\sigma \geq 1$ since sufficiently high values of σ and s bring local determinacy.

3.5 Discussion of the results

Our first step in discussing our results will be to recall the interpretation of equation (16), $\phi(l) = \mu B/\alpha$, characterizing a steady state (such that $l = f(l)$) by the equality of the inverse labour demand and supply functions. Naturally, applying to such steady state the condition $\phi'(l) < 0$, with ϕ' given by equation (18), can then be interpreted as imposing a condition on the slopes (or on the elasticities) of those functions. To be explicit, applying $\phi'(l) < 0$ is equivalent to requiring that the elasticity of the inverse demand function $\alpha l^{\alpha-1}$ be smaller than the elasticity of the inverse supply function $\mu(B/l_t + \alpha(v - sl_t^{\sigma}))$ at the point where the two graphs intersect:

$$\alpha - 1 < -\frac{B/l + \alpha\sigma s l^{\sigma}}{B/l + \alpha(v - sl^{\sigma})}, \tag{23}$$

or, using (16),

$$1 < \frac{\mu(v - (1+\sigma)sl^{\sigma})}{\alpha l^{\alpha-1}}, \tag{24}$$

that is, $\phi'(l) < 0$ by equation (18).

Clearly, the reverse condition $\phi'(l) > 0$ requires that the elasticity of the inverse demand function be *larger* than the elasticity of the inverse supply function: the case where the graphs of the two functions cross with so-called "wrong slopes" (Benhabib and Farmer,1994, 1999). This condition is enough to imply a reversal of the comparative static properties of the steady state in response to changes in the unemployment benefit, but it is just a *necessary* condition for indeterminacy ($f'(l) < 1$), to be completed by the condition $f'(l) > -1$. Figure 6, representing the labour demand and supply curves (the thin and the thick curves, respectively) on the basis of the parameter values used in Figures 3 and 4 (and zooming on the two larger steady states), illustrates the standard case ($l \simeq 0.24$) where the curves cross with the "right" slopes and the non-standard one ($l \simeq 0.84$) where they cross with the "wrong" slopes. The dotted curve represents labour supply for a higher

value of the unemployment benefit. The shift in labour supply induces a decrease of steady state employment in the standard case, an increase in the non-standard one.

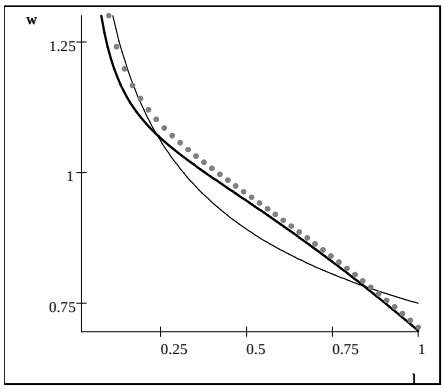

Figure 6

Therefore in the presence of strong social norms, where we obtain an additional intersection between the two curves for a higher, and more plausible level of the employment rate l, characterised by the appearance of "wrong slopes", standard policy recommendations concerning the level of unemployment benefits and its discouraging effects on employment are no longer valid. This point is worth mentioning, since this will happen for the more realistic levels of unemployment, and it is supported by empirical evidence. Indeed, Cörvers and Golsteyn (2004), for a sample of Dutch men between 1994 and 2000, found that the willingness to work of the nonemployed increased remarkably in an upswing, and that this increase was entirely due to push factors (social pressure) while pull factors (like the wage/benefit ratio) had no effect at all. Moreover Clark (2003) also suggests that "the weak role of income in well-being regressions casts some doubt on the efficacy of policy aimed solely at reducing unemployment benefits" (p.346). However, to our knowledge this is the first work that shows that, in the presence of sufficiently strong social norms, a policy aimed at reducing unemployment benefits may backfire, implying instead a decrease in employment. As emphasised in the work of Agell (1999), "many of the institutions that are pictured as the bad guys according to the received wisdom may have a more appealing appearance when analyzed from the perspective of incomplete markets [and other

market failures]. Under certain conditions, unions, minimum wages, and unemployment benefits may promote an efficient resource allocation" (p.F150).

The conclusion that a strong social norm facilitates the emergence of steady state multiplicity was also conjectured by Clark (2003) that remarked that "complementarities in labour force status have important implications for potential multiple equilibria" (p.346). A multiplicity result confirming this conjecture was obtained by Kolm (2005), who found that introducing a normative pressure to earn one's own living, in an otherwise basic textbook model of unemployment *à la* Pissarides (2000) may generate multiple unemployment equilibria. Notice however that Kolm (2005) obtains three equilibria "with an inversed S-shaped relationship between the psychological costs of being unemployed and unemployment" (p.429), which results in the numerical simulation from a logistic function, whereas in our framework we can obtain three steady states even with a linear specification (when $\sigma = 1$).

Finally, a new result worth commenting is the role of social norms as a source of fluctuations. As discussed above, a strong social norm is required for the appearance of an additional higher, and more plausible, steady state employment equilibrium, where one necessary condition for indeterminacy ($f'(l^{**}) < 1$) is verified. In this sense strong social norms promote indeterminacy for realistic values of the unemployment rate, opening the door to the emergence of expectations driven cycles (sunspots). However, very strong social norms (in the sense of a very high level s of unemployment disutility, together with a very high elasticity σ with respect to employment) lead to local determinacy, without excluding the existence of deterministic and stochastic global fluctuations. The mechanism behind this outcome is similar to familiar ones triggered by externalities in production or in leisure. In both cases the wrong slopes condition is necessary (and in some cases also sufficient) for indeterminacy, but the slope that is affected is not the same. With sufficiently strong production externalities the labour demand curve becomes positively sloped, while with leisure externalities the slope of the labour supply curve may become negative.[11] As expected, employment social norms and leisure externalities share a similar indeterminacy mechanism,[12] with different economic interpretations.

[11] See Benhabib and Farmer (2000).

[12] Notice that, as with employment social norms, local indeterminacy is favoured by a high (but not too high) elasticity of leisure externalities: see Weder (2004) and Barbar (2010).

4 Universal lump sum old-age pensions

We assume in this section that old-age pensions are the sole government subsidy, and that they are constant and financed by labour taxation: $B_t = 0$, $R_t = R > 0$ and $T_t = R/l_t$ (according to the government budget constraint (1)) for any t. By using these specifications in equation (12), we obtain:

$$l_t = \left[\frac{\mu}{\alpha}\left(\frac{R}{l_t} + (v - sl_t^{\sigma})\,\alpha\frac{l_t^{\alpha} - R/\alpha}{E_t\left(l_{t+1}^{\alpha}\right) - R}\right)\right]^{-1/(1-\alpha)}. \tag{25}$$

A comparison of this equation with equation (14) shows that the unemployment benefit B is simply replaced by the universal old-age pension R, which however also appears in the expression, now more complex, of the reciprocal of the real interest factor: $\left(l_t^{\alpha} - R/\alpha\right) / \left(E_t\left(l_{t+1}^{\alpha}\right) - R\right)$. As in the preceding section, we may reformulate according to Assumption 4 ($R < \alpha/\mu$) the temporary equilibrium condition (25) in terms of deterministic forward dynamics:

$$l_{t+1} = \left(R + \frac{\mu\left(\alpha l_t^{\alpha} - R\right)\left(v - sl_t^{\sigma}\right)}{\alpha l_t^{\alpha} - \mu R} l_t\right)^{1/\alpha} \equiv g\left(l_t\right) \text{ for } l_t \in \left(\left(\mu R/\alpha\right)^{1/\alpha}, 1\right). \tag{26}$$

By this equation, a steady state is a solution to the equation:

$$\begin{aligned}\gamma(l) \;\equiv\; & \frac{1}{2}\left(1 + \frac{\mu}{\alpha}\right) l^{\alpha} - \frac{\mu}{2\alpha}\left(v - sl^{\sigma}\right) l - \\ & \sqrt{\left(\frac{1}{2}\left(1 + \frac{\mu}{\alpha}\right) l^{\alpha} - \frac{\mu}{2\alpha}\left(v - sl^{\sigma}\right) l\right)^2 - \frac{\mu}{\alpha} l^{\alpha}\left(l^{\alpha} - \mu\left(v - sl^{\sigma}\right) l\right)} \\ =\; & \frac{\mu R}{\alpha}.\end{aligned} \tag{27}$$

We shall not proceed to a formal analysis of the number and local dynamic properties of steady state equilibria along the same lines as in the preceding section, an analysis which would now be more cumbersome, only to obtain the same kind of results that we expressed in Propositions 1, 2 and 3. We shall instead limit our study to the reproduction, adapted to the present context, of the same two numerical examples. We thus use precisely the same parameter values and take for R the value we took for B. The graph of function γ is represented by the thick curve in Figures 7 (for $s = 0.2$, the

case of a weak social norm) and 8 (for $s = 0.4$, the case of a strong social norm).[13] The thin curve represents, for the sake of comparison, the graph of the function ϕ of last section.

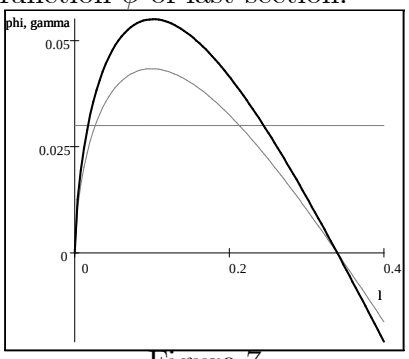

Figure 7

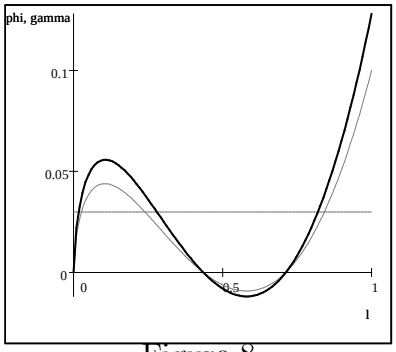

Figure 8

As we see, switching from the regime of unemployment benefits to the regime of universal old-age pensions is favorable to employment when the economy is in the determinate steady state where the functions ϕ and γ are decreasing, but unfavorable, in the economy with a strong social norm, when it is in the high employment steady state where these functions are increasing.

Except for these second order effects, any of the two regimes of redistribution policy under consideration lead to essentially the same general results, in spite of a quite different direct impact on the reservation wage. Indeed, an increase in the unemployment benefit directly increases the reservation wage, which seems detrimental to employment, contrary to an increase in the universal old-age pension (see (5)). However, once we take into account the government's budget constraint and the general equilibrium channel working through the share price, we are left with a dynamic system with the same comparative statics and dynamic properties under the two regimes.

5 Concluding remarks

We have discussed employment dynamics and redistribution policy regimes in the presence of social norms that shape the participation decision of workers and the wage bargaining. Our main result is that workers' social norms matter. In particular, an employment social norm increases the likelihood of equilibrium multiplicity, indeterminacy and flip bifurcations. We found

[13] Figure 5 can also be replicated for the present regime with the same parameter values.

that a sufficiently strong social norm is required for the appearance of an additional higher, and more plausible, employment steady state equilibrium, characterised by "wrong slopes" of the labour supply and demand curves. This condition is sufficient to make an increase in unemployment insurance beneficial to steady state employment, thus reversing standard policy prescriptions. As the existence of strong social norms receives empirical support, we thus present a strong case against the usual caveats of redistribution in favor of the unemployed.

When the "wrong slopes" condition is met, the steady state may be either indeterminate or determinate. In the first case we obtain existence of local endogenous stochastic fluctuations (stationary sunspots). In the second case, which is associated with a very strong (and responsive) employment social norm, there are no fluctuations around the steady state, but global deterministic and stochastic fluctuations cannot be excluded. Therefore, a strong employment social norm is responsible not only for steady state equilibrium multiplicity, but also for possible dynamic inefficiencies due to expectations coordination failures.

Another relevant conclusion is that in our framework the choice of the redistribution instrument does not seem to be relevant. In fact, partly because we have assumed consumption to take place only in the second period of the consumer's life, the results are quite similar for the two types of subsidies considered: unemployment benefits and universal old-age survival pensions. Since the reservation wage is directly affected by unemployment benefits, but not by the survival pensions, this illustrates the importance of taking into account general equilibrium channels of influence when assessing the effects of redistribution policies.

References

[1] Agell, J. (1999) On the benefits from rigid labour markets: Norms, market failures, and social insurance. *The Economic Journal* 109, F143-F164.

[2] Akerlof, George A. (1980) A theory of social custom, of which unemployment may be one consequence. *Quarterly Journal of Economics* 94, 749-775.

[3] Akerlof, George A. and Janet Yellen (1984) The fair wage-effort hypothesis and unemployment. *Quarterly Journal of Economics* 105, 255-283.

[4] Alesina, Alberto and Dani Rodrik (1994) Distributive politics and economic growth. *Quarterly Journal of Economics* 109, 465-490.

[5] Azariadis, Costas, Been-Lon Chen, Chia-Hui Lu and Yin-Chi Wang (2012) A two-sector model of endogenous growth with leisure externalities. IEAS Working Paper No. 12-A014, Taiwan.

[6] Barbar, Riham (2010) Leisure externalities and endogenous cycles in an OLG model. Document de recherche EPEE No. 10-10, Université d'Evry.

[7] Benhabib, Jess and Roger E.A. Farmer (1994) Indeterminacy and increasing returns. *Journal of Economic Theory* 63, 19-41.

[8] Benhabib, Jess and Roger E.A. Farmer (1999) Indeterminacy and sunspots in macroeconomics. In John B. Taylor and Michael Woodford (eds.), *Handbook of Macroeconomics*, vol. 1, ch. 6, pp. 387-448. Amsterdam: North-Holland.

[9] Benhabib, Jess and Roger E.A. Farmer (2000) The Monetary Transmission Mechanism. *Review of Economic Dynamics* 3, 523-550.

[10] Clark, Andrew (2003) Unemployment as a social norm: Psychological evidence from panel data. *Journal of labour Economics* 21, 323-351.

[11] Cörvers, Frank and Bart Golsteyn (2004) Social norms and the willingness to work of non-working men. Mimeo, ROA, Maastricht University.

[12] Duernecker, Georg (2008) To begrudge or not to begrudge: consumption and leisure externalities revisited. *Applied Economics Letters* 15, 245–252.

[13] Elster, Jon (1989) Wage bargaining and social norms. *Acta Sociologica* 32, 113-136.

[14] Gómez, Manuel A. (2008) Consumption and leisure externalities, economic growth and equilibrium efficiency. *Scottish Journal of Political Economy* 55, 227-249.

[15] Grandmont, Jean-Michel (2008) Negishi–Solow efficiency wages, unemployment insurance and dynamic deterministic indeterminacy. *International Journal of Economic Theory* 4, 247–272.

[16] Grandmont, Jean-Michel, Patrick Pintus and Robin de Vilder (1998) Capital-labour substitution and competitive nonlinear endogenous business cycles. *Journal of Economic Theory* 80, 14–59.

[17] Hedström, Peter, Ann-Sofie Kolm and Yvonne Åberg (2003) Social interactions and unemployment. Working Paper Series 2003:18, Uppsala University, Department of Economics.

[18] Kolm, Ann-Sofie (2005) Work norms and unemployment. *Economics Letters* 88, 426-431.

[19] Lindbeck, Assar, Sten Nyberg and Jörgen W. Weibull (1999) Social norms and economic incentives in the welfare state. *Quarterly Journal of Economics* 114, 1-35.

[20] Lloyd-Braga, Teresa, Leonor Modesto and Thomas Seegmuller (2011) Market distortions and local indeterminacy: A general approach. IZA Discussion Paper No. 5603, Bonn. Forthcoming in *Journal of Economic Theory.*

[21] Persson, Torsten and Guido Tabellini (1994) Is inequality harmful for growth? *American Economic Review* 84, 600-621.

[22] Pintea, Mihaela I. (2010) Leisure externalities: Implications for growth and welfare. *Journal of Macroeconomics* 32, 1025-1040.

[23] Pissarides, Christopher A. (2000) *Equilibrium Unemployment Theory.* Cambridge, MA: MIT Press.

[24] Weder, Mark (2004) A note on conspicuous leisure, animal spirits and endogenous cycles. *Portuguese Economic Journal* 3, 1-13.