Habit formation and dependency in the welfare state

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Abstract: External habit formation explains why welfare states can be expected to exhibit increasing dependency over time through increases in the share of the population receiving welfare transfers, while the average number of hours worked decreases. Under plausible parameter values, the rate of taxation (and also the welfare expenditure share of national income) monotonically increases over time and asymptotically approaches a steady state. A *positive interactive feedback loop* between slow-moving external habits and welfare policies makes the extent of redistribution a "moving target". Consequently, setting arbitrary redistributive goals may never satisfy redistributional demands in future periods. At the same time, technological progress may mask the underlying dynamic effects of the welfare state.

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1. Introduction

The growth of redistribution through the welfare state (see, for example, Alesina and Perotti, 1997; OECD, 1997; Tanzi and Schuknecht, 2000, especially chapter 2) has resulted in considerable scholarly effort devoted to understanding the *causes* of the growth. Some authors suggest that the expansion of the modern welfare state reflects a desire to level distributional asymmetries (Putterman et al., 1998; Snower, 1993). Some claim that it is a rational attempt to pool otherwise uninsurable risks under the aegis of the state (Barr, 1992; Varian, 1980; or see Hillman, 2003, for an overview of income redistribution as a social insurance contract). Yet others contend that the growth is the result of a positive income

elasticity for government services or redistribution (see Hillman, 2003, pp. 602–603). There is, however, a tradition that is suspicious of explanations that are inherently normative and that simply assume redistribution follows from an altruistic impulse to alleviate inequalities (see, for example, Alesina and Rodrik, 1994; Husted and Kenny, 1997; Olson, 1982; Persson and Tabellini, 1994; Stigler, 1970; Tullock, 1974, 1981).

The *effects* of the welfare state's redistributive activities have received significant attention. A principal question concerns the extent of an "efficiency-equity" trade off—assuming of course that equity is part of the government's objective function. The verdict is mixed: Fölster and Henrekson (2001), Henrekson (1996), Lindbeck (1993, 1997), Lundberg (1985), and Rosen (1996) suggest that the rise of the ambitious welfare state has often come at a high price in terms of program costs, productivity, investments in human capital, and ultimately economic development.[1] Other studies downplay either the magnitude of these costs (Korpi, 1996; and see Putterman et al., 1998, for a survey), or point out that, while the costs might be substantial for some groups, the welfare state endeavor has been worthwhile because of overall leveling effects (Putterman et al., 1998). It has also been asserted that eliminating distributional asymmetries may be growth-enhancing (Korpi, 1985; Putterman et al., 1998).

While numerous insights have been derived, and our understanding of various aspects of the welfare state have improved, limited attention has been directed at understanding redistributive processes over time that might encompass both causes *and* effects of redistributional policies in an evolutionary framework. The static nature of traditional models does not allow consideration of how the welfare state develops dynamically. The best existing models can do is to analyze comparative statics to determine whether we might expect influences such as welfare "stigma" (see, for example, Lindbeck et al., 1999) to promote or inhibit redistributive activity.

[1] See Hillman (2003), especially chapter 5, for a concise overview of the limitations of a redistributive welfare state due to taxation and moral hazard.

In this paper we use external habit formation to formulate a theory of dynamics of the welfare state.[2] From an external habit formation perspective, an individual's utility depends not only on his or her own consumption, but benchmark-level consumption; the latter, in turn, depends upon the value of aggregate consumption. "Catching up with the Joneses" is a commonly used phrase referring to the dependence of the benchmark level of consumption on the *lagged* value of aggregate consumption.[3]

We propose that external habits play a significant role in political-economic dynamics. Indeed, some time ago, Lindbeck (1985) and North (1985) similarly postulated that "changing tastes" must somehow be a key factor in the growth of government during the twentieth century. While ours and theirs are not precisely synonymous hypotheses, there is a close relationship, in that tastes change over time if individuals exhibit a propensity to "catch up with the Joneses". Our contribution is to extend and formalize the Lindbeck-North proposition by recognizing that external habit formation features prominently in the dynamics of the welfare state. As far as we are aware, this is a unique approach to the study of the welfare state. We obtain novel conclusions concerning the sustainability of growing transfers, especially when we account for technology. We also integrate the notion that social norms play a key role in speeding up or slowing down a society's rate of transfer growth. Our results help explain an array of casual observations concerning the development of the welfare state, such as the secular trend upward of redistribution and taxation in virtually all welfare states, higher rates of unemployment despite sometimes vigorous rates of economic growth, and a decrease in the number of hours worked. Moreover, we believe we can further clarify, theoretically, the unresolved debate over whether increasing redistributive activity decreases growth, as well as why, even if the welfare state can be proven to be deleterious to growth, large numbers of individuals continue to support it (see for example Nannestad, 2004). Our dynamic characterization provides answers to two basic questions concerning the welfare state: why do transfers grow, and what are the consequences of this growth?

[2] Abel (1990) presents a seminal analysis of external habit formation, which has implications for asset pricing.
[3] This literature has dealt with some well-known puzzles in financial markets by incorporating external habit formation into the standard power utility consumption-based theory (Campbell and Cochrane, 1999). Auray et al. (2002) model external habits that can generate chaos in a simple monetary economy.

The next section describes the model, analyzes the equilibrium in the dynamic setting, and examines the comparative dynamics of the system. Section 3 discusses the results and key implications. Section 4 concludes.

2. A model of welfare state dynamics with external habit formation

2.1 The setting

We assume a continuum of individuals with wages evenly distributed between [0,*b*], i.e., w~*U*(0,*b*). Each individual is endowed with one normalized unit of time, which may be devoted either to working or to leisure. All individuals have the same preferences and at each period of time, τ, utility derives from both consumption, c_τ, and a leisure index, v_τ; utility is: $u(c_\tau, v_\tau) = \alpha \ln c_\tau + \beta \ln v_\tau$, $\alpha, \beta > 0$. The leisure index during period τ (v_τ) depends not only on the leisure of said period, l_τ, but also on the average leisure enjoyed by the entire society during the preceding period of time, $\overline{L}_{\tau-1}$, the latter representing external habit formation in this society. We specify external habit formation as $v_\tau(l_\tau, \overline{L}_{\tau-1}) = l_\tau - \theta\overline{L}_{\tau-1}$, where θ is a small positive number characterizing the magnitude of the effect of the external environment on the individual.[4] If a person chooses to work, he or she works for h units of time and allocates the rest (1–*h*) units of time for leisure, where *h* is the number of legal hours in a day or week (for example, 40 working hours per week). Otherwise, he or she lives on the welfare transfer and devotes all available time to leisure, i.e., $l_\tau = 1$. Whether the agent chooses to work or live on the welfare transfer depends on the policy of the government in period τ, which consists of the rate of income tax, t_τ, and transfer, T_τ to anyone who does not work (and hence has no income). The decision horizon of the agent is Z periods (Z can be a finite integer or infinity). Future utility is discounted (δ) at the interest rate *r* for technical simplicity; that is, $\delta = (1+r)^{-1}$. Thus, at the outset of period τ, the agent choosing to work maximizes[5]

[4] See also Auray et al. (2002).

[5] The decision problem of the individual choosing to live on welfare can be similarly formulated. While it is more easily illustrated than the worker's scenario, we omit it to save space. An individual in our model makes decisions based on adaptive expectations in the sense that the benchmark level of leisure consumption is derived

$$\sum_{s=0}^{Z-1} \delta^{-s} u_{\tau+s} = \sum_{s=0}^{Z-1} (1+r)^{-s} [\alpha \ln c_{\tau+s} + \beta \ln(1-h-\theta \bar{L}_{\tau-1})], \quad (1)$$

subject to the inter-temporal budget constraint

$$\sum_{s=0}^{Z-1} (1+r)^{-s} c_{\tau+s} \leq Y_\tau + \sum_{s=0}^{Z-1} (1+r)^{-s} h t_\tau w_{\tau+s}, \quad (2)$$

where Y_τ is accumulated wealth at the outset of period τ (assumed to be zero at the outset of period one).

We assume that the government redistributes income to maximize a given period's Benthamite social welfare function, which, while simplifying, is reconcilable with more sophisticated political models based on probabilistic voting.[6] We therefore do not address the complex problems involved with actual collective decisions regarding redistribution, including voting, rent seeking, or principal agent problems.[7]

The policy-making government anticipates individuals' reactions to policy packages when designing the "optimal" welfare policy. The politico-economic interaction between the welfare state and individuals is thus modeled as a Stackelberg game in which the government is leader and citizens are followers. Formally, at period τ, the government's discretionary policy variables are (T_τ, t_τ), where the transfer T_τ is provided to anyone who does not work (and hence has no income) and t_τ is the linear tax rate imposed on income. The government designs its policy to maximize the Benthamite social welfare for the said period:

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from what happened in the preceding period; this benchmark level of leisure is also used for deciding on the allocation of time at the outset of any period into the future. In such a formulation, we assume that individuals cannot correctly predict what numerous other macroeconomic variables will be (for instance, how many individuals will live on transfer in each future period). Our assumption is further strengthened by the fact that governments may change at each electoral cycle.

[6] For example, Coughlin (1986) and Ledyard (1984) develop political economic models with probabilistic voting where candidates redistribute income to voters. If candidates compete for votes by redistributing income to maximize their expected vote, and citizens' probability of voting for a candidate is a function of the difference in utilities promised by two candidates, then the first order conditions that must be satisfied by each candidate to maximize his or her expected vote is the same condition that must be satisfied to maximize an additive Benthamite welfare function (see Mueller, 2003, p. 253–254 for a summary).

[7] For a summary of many of these complicating issues in the context of redistribution, see Hillman (2003, especially chapter 5).

$$G(t_\tau, T_\tau) = \int \tilde{u}(t_\tau, T_\tau | w, \bar{L}_{\tau-1}) \phi(w) dw, \quad (3)$$

where $\tilde{u}(t_\tau, T_\tau | w, \bar{L}_{\tau-1})$ is the maximized utility of any person with wage w for a given welfare policy (T_τ, t_τ), and $\phi(w)$ is the density function of the wage distribution, $\phi(w) = 1/b$, $w \in (0, b)$. The tax rate, t_τ, and welfare transfer, T_τ, are however not independent owing to a balanced budget constraint. That is, the government chooses its policy package from the feasible decision set with a balanced budget.[8]

2.2 Individual choices, welfare policy and the politico-economic equilibrium

We now analyze the politico-economic equilibrium between the redistributive government and individuals during any given period τ. The intuition runs as follows: individuals maximize utility for any given policy signal by choosing whether to work; and their decision horizon can be more than one period. On the other hand, the balanced-budget constrained government attempts to design an optimal policy package to maximize social welfare for the current period only. Note that when the government maximizes its objective in a given period (which can be literally interpreted as one term of the administration), it is based on the habits of agents, which are shaped by a history that is perfectly observed by all, including the government. This assumption is consistent with (although it does not necessarily depend upon) postulating that politicians are more likely to maximize short-run, rather than long run, objectives. This assumption is also justified if the government cannot anticipate future shifts in demand for the welfare state, per se, due to limited foresight or information.[9]

We use backward induction to solve the Stackelberg game. Since the discount rate is equal to the interest rate, at the outset of any period τ, the individual's optimal consumption for each period, from period τ onward, is the same (as can be readily verified from the Euler equation). The wealth accumulated until the end of each period is equal to zero because the

[8] A balanced budget assumption is one commonly employed (see, for example, Lindbeck et al., 1999).

[9] The myopia of government is extensively analyzed in the *political business cycle* literature. Two robust empirical results that seem to emerge are that: (i) voters are myopic, and (ii) voters expectations are retrospective when it comes to choosing candidates (or parties). Both suggest a short time horizon for governments. See Paldam (1997, pp. 345–348).

initial value of wealth at the outset of period one is assumed to be zero. That is, the individual choosing to work (or not) consumes all income (or, all the received welfare transfer) without saving or borrowing. Thus, for a given welfare policy (T_τ, t_τ), the individual with wage w chooses to work, if and only if

$$\alpha \ln((1-t_\tau)hw) + \beta \ln(1-h-\theta\bar{L}_{\tau-1}) > \alpha \ln(T_\tau) + \beta \ln(1-\theta\bar{L}_{\tau-1}). \quad (4)$$

We can derive a "critical wage", w_*, which is the wage at which individuals will be indifferent between working and receiving a wage on the one hand, and not working and collecting the transfer, from the government, on the other. For any person with wage $w > w_* \equiv \frac{T_\tau}{h(1-t_\tau)} \cdot (\frac{1-\theta\bar{L}_{\tau-1}}{1-\theta\bar{L}_{\tau-1}-h})^{\beta/\alpha}$, the optimal choice is to work; for any person whose wage is $w<w_*$, the optimal choice is to remain unemployed and receive a transfer T_τ. The measure of the set of "critical persons" at w_* is zero, thus their choices affect neither the budget balance nor Benthamite social welfare and we can therefore assume them to be transfer beneficiaries. The utility of each individual with wage w facing policy package (T_τ, t_τ) during period τ can be expressed as,

$$\tilde{u}(t_\tau, T_\tau | w, \bar{L}_{\tau-1}) = \begin{cases} \alpha \log(T_\tau) + \beta \log(1-\theta\bar{L}_{\tau-1}), \forall w \in [0, w_*] \\ \alpha \log(hw(1-t_\tau)) + \beta \log(1-\theta\bar{L}_{\tau-1}-h), \forall w \in (w_*, b] \end{cases}. \quad (5)$$

The redistributive state as the Stackelberg leader maximizes the Benthamite SWF, $G(t_\tau, T_\tau) = \int \tilde{u}(t_\tau, T_\tau | w, \bar{L}_{\tau-1}) / b dw$, by choosing from the budget balanced policy packages (T_τ, t_τ). This implies that the government maximizes

$$G(t_\tau, T_\tau) = \alpha \log h + \beta \log(1-h-\theta\bar{L}_{\tau-1}) + \alpha \log b - \alpha + \alpha[\log(1-t) + \frac{w_*}{b}], \quad (6)$$

subject to the budget constraint $\int_0^{w_*} T\phi(w)dw = \int_{w_*}^{b} hwt\phi(w)dw$, which is equivalent to

$$w_* = \sqrt{\frac{\eta_\tau}{1+\eta_\tau}} \cdot b, \quad (7)$$

where $\eta_\tau \equiv \frac{t_\tau}{2(1-t_\tau)} (\frac{1-\theta\bar{L}_{\tau-1}}{1-\theta\bar{L}_{\tau-1}-h})^{\beta/\alpha}$. Inserting (7) into (6), the first order condition (FOC) with respect to the variable t_τ yields:

$$\frac{1}{1+\eta_\tau} = 2t_\tau\sqrt{\frac{1+\eta_\tau}{\eta_\tau}}. \tag{8}$$

Note that the left-hand side of (8) decreases from 1 to 0, and the right-hand side increases (i.e., it can be shown that the first order derivative of the right-hand side with respect to t is positive) from 0 to 2 as the value of t_τ increases from 0 to 1. By Bolzano's theorem, there exists a unique t_τ^* satisfying (8) for any parameter. The second order condition can be verified by making use of FOC (8). Consequently, the optimal transfer is:

$$T_\tau^* = hbt_\tau^*/[2\sqrt{\eta_\tau^*(1+\eta_\tau^*)}]. \tag{9}$$

In sum, for any parameter, there exists a unique optimal welfare policy package (t_τ^*, T_τ^*), stated implicitly by (8) and (9), for the subgame perfect Nash equilibrium solution (SPNE) of the politico-economic Stackelberg game.

2.3 External habit formation and welfare state dynamics

The dynamics of the welfare state are here driven by external habit formation, which in turn is induced by welfare state policy. The redistributive welfare policy implemented in any period induces alterations in the average amount of leisure consumed from that in the previous period. Welfare policy in the next period is therefore designed and implemented based upon this altered benchmark level of leisure consumption in the previous period. It is precisely this iterative process that gives rise to *a dynamic model of redistributive activities* as (external) habits are endogenously updated.

More precisely, suppose that at some benchmark period, period zero, there exists no welfare program, i.e., t_0=0, T_0=0, $\bar{L}_0 = 0$. During period 1, however, the redistributive welfare policy is initiated and both t_1 and T_1 are set as positive numbers; this is characterized by

equations (8) and (9). The optimal welfare policy package for the government (t_1^*, T_1^*) is given in equation (10), by solving the subgame perfect Nash (politico-economic) equilibrium,

$$\frac{1}{1+\eta_1^*} = 2t_1^*\sqrt{\frac{1+\eta_1^*}{\eta_1^*}}, \qquad \text{where } \eta_1^* \equiv \frac{t_1^*}{2(1-t_1^*)}\left(\frac{1}{1-h}\right)^{\beta/\alpha}. \tag{10}$$

This yields the population share of transfer beneficiaries,

$$s_1 = \int_0^{w_{1*}} \phi(w)dw = \frac{w_{1*}}{b} = \sqrt{\frac{\eta_1^*}{1+\eta_1^*}}, \tag{11}$$

and the average leisure in period one,

$$\bar{L}_1 = 1 - \int_{w_{1*}}^{b} \phi(w)hdw = 1 - h + h\sqrt{\frac{\eta_1^*}{1+\eta_1^*}}, \tag{12}$$

which are both positive. At the end of period one, which may be literally interpreted as the welfare state's first term of administration, the benchmark level of leisure for individuals is not the same as it was before the welfare policy was introduced.

At the outset of period 2, the (potentially new) administration repeats the game with individuals for whom the benchmark level of leisure has been updated to $\bar{L}_1$. Similar analysis as that for period one leads to the SPNE solution (T_2^*, t_2^*), which is implicitly stated by

$$\frac{1}{1+\eta_2^*} = 2t_2^*\sqrt{\frac{1+\eta_2^*}{\eta_2^*}}, \ \eta_2^* \equiv \frac{t_2^*}{2(1-t_2^*)}\left(\frac{1-\theta\bar{L}_1}{1-\theta\bar{L}_1-h}\right)^{\beta/\alpha} \tag{13}$$

and

$$T_2^* = \frac{hbt_2^*}{2\sqrt{\eta_2^*(1+\eta_2^*)}}. \tag{14}$$

Consequently, the average leisure consumed during period two is

$$\bar{L}_2 = 1 - h + h\sqrt{\frac{\eta_2^*}{1+\eta_2^*}}. \tag{15}$$

From period three onwards, the pattern repeats itself over a number of periods. However, as shown in the Appendix, η_τ^* is an increasing function of $\bar{L}_{\tau-1}$ for any period τ. It therefore

follows from $\bar{L}_\tau = 1-h+h\sqrt{\frac{\eta^*_\tau}{1+\eta^*_\tau}}$ that $\bar{L}_\tau > \bar{L}_{\tau-1}$, if and only if $\bar{L}_{\tau-1} > \bar{L}_{\tau-2}$ for any period $\tau \geq 2$. But $\bar{L}_1 > 0 = \bar{L}_0$. The average leisure of this society in each period, $\{\bar{L}_\tau\}$, is thus an increasing sequence bounded from above by 1. Consequently, the average leisure sequence $\{\bar{L}_\tau\}$ converges to some limit L^* over time, which can be thought of as the "stationary state" of a dynamic welfare state system with external habit formation.

Denoting the corresponding variables by "*", we have, $L^* = 1-h+h\sqrt{\frac{\eta^*}{1+\eta^*}}$, $\frac{1}{1+\eta^*} = 2t^*\sqrt{\frac{1+\eta^*}{\eta^*}}$ and $T^* = \frac{hbt^*}{2\sqrt{\eta^*(1+\eta^*)}}$, from which it follows that $L^* < 1$; otherwise $\eta^* = \infty$, $\frac{1}{1+\eta^*} = 2t^*\sqrt{\frac{1+\eta^*}{\eta^*}}$, and $\eta^* \equiv \frac{t^*}{2(1-t^*)}\left(\frac{1-\theta L^*}{1-\theta L^*-h}\right)^{\beta/\alpha}$ cannot hold simultaneously. Note $\{\eta^*_\tau\}$ increasingly approaches its limit as does $\{\bar{L}_\tau\}$, due to $\bar{L}_\tau = 1-h+h\sqrt{\frac{\eta^*_\tau}{1+\eta^*_\tau}}$ for all τ. The tax rate sequence $\{t_\tau\}$ also asymptotically approaches its limit t^*. The population share living on the transfer in the steady state is: $s^* = \int_0^{w_*} \phi(w)dw = \frac{w_*}{b} = \sqrt{\frac{\eta^*}{1+\eta^*}}$. The population share living on transfers in each period is an increasing function of the benchmark leisure level $\bar{L}_{\tau-1}$ and thus the transfer beneficiary share sequence $\{s_\tau\}$ also increasingly approaches its limit s^*.

A striking aspect of the dynamic setting is that we encounter a *positive interactive feedback loop*: once the policy mix, (*t, T*), is initiated (set > 0), the population share living on transfers begins increasing to some steady state. Also, the path of average working hours, $\bar{H}_\tau = 1-\bar{L}_\tau$ monotonically decreases to approach its limit as $H^* = 1-L^*$. We are thus led to:

Proposition 1: *When individuals attempt to catch up with the Joneses in leisure, the dynamic interaction between these external habit effects and an income redistribution policy leads to a continuous increase in the population share of beneficiaries living on transfers. The average number of hours worked by individuals monotonically decreases over time. Aggregate output (GDP) also decreases over time if labor productivity is held constant since fewer hours are worked. As a result, the economy asymptotically approaches its stationary state.*

We now turn to the dynamics of the tax rate $\{t_\tau^*\}$. As shown above, for any parameter value, the sequence $\{\eta_\tau\}$ monotonically increases over time. From Equation (8), we find that $\partial t_\tau^* / \partial \eta_\tau^* > 0$, if and only if $\eta_\tau^* < \frac{1}{2}$. It thus follows $t_{\tau+1}^* > t_\tau^*$, if and only if $\eta_\tau^* < \frac{1}{2}$. Although $\eta_\tau^* < \frac{1}{2}$ will not necessarily hold for any arbitrarily chosen parameter value, it does hold for those values of $\mu(\bar{L}_{\tau-1}) \equiv \frac{1}{2}(\frac{1-\theta\bar{L}_{\tau-1}}{1-\theta\bar{L}_{\tau-1}-h})^{\beta/\alpha}$, which are not too large. We can show, without going into unnecessary detail, that $\eta_\tau^* < \frac{1}{2}$ for any period τ, provided $(\frac{1-\theta\bar{L}_{\tau-1}}{1-\theta\bar{L}_{\tau-1}-h})^{\beta/\alpha} < 4$. Given that working hours as a percentage of the time endowment (h)are reasonably low (for example, in the case of forty working hours per week, $h = 40/(7\times 24) \approx 0.24$), the habit formation parameter is plausibly even much smaller. The relative weight of utility derived from leisure compared to that from consuming goods and services is also small (i.e., β/α is a small value). As such, $(\frac{1-\theta\bar{L}_{\tau-1}}{1-\theta\bar{L}_{\tau-1}-h})^{\beta/\alpha} < 4$ invariably holds for all plausible cases of reality and consequently $\eta_\tau^* < \frac{1}{2}$, for any period τ.[10] $\{t_\tau^*\}$ will also increasingly approaches its limit, t^*. Note, moreover, that in our framework welfare expenditure as a percentage of the aggregate output (which can simply be interpreted as GDP) is just the linear tax rate. We therefore have,

Proposition 2: *Under plausible values of parameters (small values of h, β/α and an even smaller habit formation parameter θ), the taxation rate (also the welfare expenditure share of GDP) monotonically increases over time and asymptotically approaches its stationary state, due to the dynamic interaction between external habit effects and welfare policies.*

2.4. Comparative dynamics

We have demonstrated how the welfare state, once initiated, evolves over multiple periods. As a result, the far-reaching implications of the commencement of state-sponsored welfare

[10] Another way to see $\eta_\tau^* < 1/2$ for plausible parameter values is that $\eta_\tau^* > 1/2$ implies that the population share living on transfers, $s_\tau^* = \sqrt{\eta_\tau^*/(1+\eta_\tau^*)}$, exceeds $\sqrt{\frac{1/2}{1+(1/2)}} \approx 60\%$, a very unlikely state of affairs.

present themselves over time. We now explore how the parameters, in particular θ (the extent to which individuals' habits are externally influenced) and the preference parameter (β/α), influence the process.

When transfers are introduced in the first period, the external habit parameter (θ) is irrelevant because leisure in the previous (benchmark) period is zero (refer to Eq. 10). But the more agents care about leisure (the greater the value of β/α), the more leisure is demanded in period one and consequently the higher will be the population percentage living on welfare transfers in this period. From period two onwards, *the external habit effect (θ) crucially shapes the dynamic process of the welfare state*.

By similar formal analyses to that in the Appendix, we can readily show that $\partial\eta_\tau^*/\partial\theta > 0$ and $\partial\eta_\tau^*/\partial(\beta/\alpha) > 0$, for any $\tau \geq 2$. Thus, for the population share receiving transfers, we have $\partial s_\tau^*/\partial\theta > 0$, $\partial s_\tau^*/\partial(\beta/\alpha) > 0$, and for the average number of hours by individuals, $\partial\overline{H_\tau}/\partial\theta < 0$, and $\partial\overline{H_\tau}/\partial(\beta/\alpha) < 0$. In other words, if we hypothetically consider two different systems that vary in terms of attitudes toward equality (or the extent to which individuals' habits are externally influenced), we expect to find that the dynamic processes of the two systems display a remarkable divergence. Indeed, not only will the steady states differ, but the speed at which each system achieves its steady state will also differ. We shall offer more discussion on this point, below.

3. Discussion

3.1 External habits, social norms and support for the welfare state

Our model suggests that once a redistributive policy is initiated, the external effects in leisure lead to a *self-reinforcing* welfare state dynamic characterized by a positive interactive feedback loop. The interactive feedback loop implies that, once set in motion, a redistributive system will take increasing shares of the economy over time. This explanation for the growth of the welfare state is distinctly different from explanations based on altruism, social insurance, or public choice explanations, such as increased bureaucratic influence, increased rent seeking, or an expanded franchise.

Because of the dynamic nature of the model, there is no objective basis to gauge individual "deservingness" of transfers in the various periods: as some individuals begin to choose to live on transfers, others will attempt to "catch up" by also demanding leisure, and as a consequence, more individuals join the ranks of welfare beneficiaries over time.[11] This accounts for the continuing high demand for redistribution despite the large increases in redistribution. Positing that policy-makers simply need to define some exogenous level of benefits to solve poverty (or any other particular welfare objective) therefore overlooks a key aspect of the dynamic redistributive process.

Moreover, because agents' tastes in leisure are changing continuously from period to period, there is no obvious multi-period benchmark by which to judge equilibria in a given period. Thus, even if we can show that GDP will fall as a result of initiating redistribution, it is not obvious that the welfare state is social-welfare reducing (or, for that matter, welfare-enhancing) because individuals prefer relatively more leisure to the consumption of goods and services in later periods. Empirically, then, we should therefore not expect that citizens' support of the welfare state necessarily to coincide with strong economic performance.

On the other hand, while an optimal path cannot be defined (in terms of social welfare), our model aids in understanding how communities with different attitudes, or social norms, react to the introduction of state transfer policies. The United States, for example, is often referred to as the "anti-welfare state", and its redistributive experience "American exceptionalism", when compared with the much more generous transfer programs in most of Europe, especially Scandinavia (see, i.e., Andersen, 2004; Putterman et al., 1998, p. 892; Stephens, 1996). Consistent with these claims is substantial anecdotal and, recently, more formal evidence that Western Europeans care substantially more about equality than Americans do (see Alesina, Di Tella and MacCulloch, 2004). We interpret such evidence in our model as Americans being less inclined to "catch up with the Joneses" than their European counterparts; that is, the United States has, for historical and cultural reasons, a smaller value of "θ".

[11] On the possibility that the erosion of social norms played a critical role in the increasing rates of illegitimacy in the United States over time, see Brinig and Buckley (1999).

The model predicts that systems with lower values of θ will experience a considerably lower trajectory of transfers and better growth and employment performance than those with a larger θ. This prediction is consistent with the historical facts if we consider the relative performance of the United States and many of the European welfare states. (see, for example, Bean, 1994). However, again, we wish to emphasize that, given our inability to positively judge differing transfer paths, we are not claiming that Americans are "happier", or are on a preferred (social welfare) path.

The question of what drives the differences in θ across societies is an important one, but not the focus of our paper. The existence of the differences does, however, raise the question of the role of *informal* rules, or social norms in our model. Norms that allow greater heterogeneity in the community suggest less pressure to conform (or to *want to* conform) to the crowd. A lower θ is expected to result, and individuals in such a community are less likely to try to "catch up" with others, whether that means consuming more goods and services, or more leisure (see Alesina, Sacerdote and Glaeser, 2001, for an analysis that suggests that Americans' relatively greater indifference concerning ex post equality is due, at least in part, to the US's peculiar history and racial heterogeneity). Norms that support greater conformity—and hence greater equality—imply a higher θ, a more rapid shift to a "transfer society" and a higher steady state of transfers (as a percentage of output).

3.2 Confronting stylized facts

Observation suggests change in the direction that our model predicts. First, over the last four decades, policy in industrial countries has been increasingly redistributive, and the expansion in the size of the government sector over the latter half of last century has been principally the consequence of these redistributive activities (see Tanzi and Schuknecht, 2000, p. 30). Redistributive expenditures have not only been large in absolute terms, averaging over 20% of GDP as long ago as 1975, but have grown remarkably over the last 40 years or so. For example, Pierson (1991, pp. 128 and 133) estimates that social expenditures increased almost four times in OECD countries between 1965 and 1985, and Tanzi and

Schuknecht (2000, p. 33) estimate that subsidies and transfers in the most developed nations increased from an average of 9.7% of GDP in 1960 to an average of 23.2% of GDP in 1995.

Tax rates have also increased: between 1965 and 1995, tax receipts across all of the OECD rose from 26 to 35 per cent of GDP and from 30 to 41 per cent in Europe (OECD, 1996a, p. 23). Also consistent with our model is the fact that the average number of hours worked by individuals in the OECD has fallen (see OECD 1998, esp. chapter 5, pp. 153-188).

In addition, several proximate indices suggest that a greater proportion of the population has become transfer beneficiaries over time. Rates of structural unemployment have increased across much of the OECD in the post-war era despite reasonable rates of economic growth (for discussion of the effect of technical progress, see below). The average rate of unemployment across Europe, North America, Japan, Australia and New Zealand was 3.4% in 1960 and 9.0% in 1996 (Tanzi and Schuknecht, 2000, p. 81). Another indication is the low, and generally decreasing, rate of labor market participation in most developed nations, but especially Western Europe. For example, men's labor force participation as a percentage of the male population (ages 15 to 64) has fallen by an average of 10% across the Anglo-speaking countries and nearly every Western (and Northern) European country from 1970 to 2000 (OECD, 2001, p. 39).[12] In 1970, the average was 91% and in 2000, it was 81%. Incidentally, the United States' rate fell by only 0.9%, and Canada's 3.4%. Between 1950 and 2000, men's participation rates in the 55–59 bracket went from 89% to 70%, and in the 60–64 bracket from 79% to 26% (ILO *official website*).[13]

Dependency rates on state benefits have in general been on an upward trend in OECD countries between 1980 and 2000 (OECD, 2003, pp. 179–185); only Japan and the United States were exceptions. In six EU countries, benefit dependency among the working age population at the turn of the century is approximately one-third of employment (OECD, 2003, p. 175). Some of the largest categories of increases were old-age benefits (due to many

[12] The exceptions are Iceland and Luxembourg.

[13] While women's rates fall in the later age bracket, we have omitted reference to them because of women's tendency for greater labor market participation over the last several decades, which is due to social and institutional factors beyond the scope of our analysis. Labor market participation rates can be obtained from ILO's web-based database, "Laborsta".

countries expanding early retirement arrangements), unemployment benefits, and "lone parent and non-categorical social assistance" benefits, the latter having doubled, on average, between 1980 and 1999 (OECD, 2003, p. 182).

3.3. Theoretical debate over the growth of government

The theoretical debate over the growth in the size of government centers upon explaining the reasons for this growth. Any one explanation seems to garner only limited empirical support (see Hillman, 2003, chapter 9; or Holsey and Borcherding, 1997, for an overview of the various hypotheses and their records of success). And, although the list of explanations includes the Lindbeck-North hypothesis that changing tastes may have led to more government, these latter accounts remain underdeveloped. Our model adds a new dimension to this debate by incorporating external habit formation that adapts to an increasingly redistributive state.

The other key aspect of the theoretical debate concerns the *effects* of the growth of government. Principally, this debate centers upon whether the growth of government is deleterious or advantageous to private sector activity, especially economic growth.[15] Our model clearly suggests that, over time, economic output falls as a result of a decrease in the number of work hours *if we hold productivity constant*, which brings us to the subject of our next sub-section.[16]

3.4. Effects of technological progress

We now turn to the issue of technological progress. In what follows, we incorporate productivity growth (without technological shocks) into our framework.

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[15] Besides the references cited above in the growth of government literature, see specifically the recent theoretical discussions in Alesina and Rodrik (1994), Persson and Tabellini (1994), and Putterman et al. (1998).

[16] Moreover, if there are increasing returns to any growing economic system resulting from increased specialization, then institutions that encourage a reduction in working hours may have additional deleterious effects beyond those considered here. See, for example, arguments by Buchanan and Yoon (1994) and Congleton (1991) concerning the positive externalities associated with a "work ethic".

Assume that wages (productivity) grow at a constant rate, r, for any wage, w. We still denote by b the highest wage during the benchmark period, period 0. Then, during any period, τ, the wage distribution is $w_\tau \sim U(0, b(1+r)^c)$. Since changes in demand for leisure are likely to be far slower than changes in technology, it can be easily shown that the level of social welfare, G^*_τ (or the general well-being of individuals), and the transfer, T_τ, can increase over time even though average working hours are decreasing and the population share living on transfers is increasing.[17] A necessary condition is that the technical growth rate, r, must be high enough to outweigh the counter effect arising from the interaction between external habit persistence and welfare policies.

This leads to another key dispute in welfare state debates: if increases in redistributive activity are efficiency-reducing, then why is the empirical evidence not more robust? (On empirical difficulties and controversies, see Agell, et al., 1997, 1999; Fölster and Henrekson, 1999, 2001.) Our model suggests that economic performance might not be a simple monotonic function of welfare expenditures, if technological progress is sufficiently greater than the change in external habit. This may well explain why it is difficult to empirically correlate expenditures with lagging economic performance. Thus, while it might be empirically the case that people are happy with the welfare state, we concur with Rosen, who suggests, "causal linkages from the welfare state to high income are tenuous" (1996, p. 729).[18]

Our model thus lends no theoretical support to efficiency-enhancing (and ultimately income enhancing) explanations of the welfare state, such as those of Barr (1992), Korpi (1985), or Putterman et al. (1998). Rather, our conclusions conform to recent empirical results of authors, such as Fölster and Henrekson (2001), who attempt to correct for many of the

[17] For the case of steady technical progress, one may assume that future utility is discounted at the interest rate compounded by the wage growth rate to simplify the analysis.

[18] Specifically, with regard to the Swedish experience, Rosen suggests that it "had achieved one of the highest standards of living in the world well before the Swedish Model was implemented. Perhaps it was the great wealth generated by the Swedish economy that allowed this model to grow and flourish, for living standards, while still high and generally growing, have eroded relative to other wealthy nations in the past two or three decades" (1996, p. 729).

econometric shortcomings in pre-existing applied work on state size and economic performance. Our results are also consistent with the theoretical and empirical results of Alesina and Rodrik (1994) and Persson and Tabellini (1994) regarding the growth retardation of redistributive policies, although our framework of analysis is quite different from theirs.[19]

4. Conclusions

We have incorporated external habit formation into the study of the growth of the welfare state. Our analysis suggests that redistributive welfare states will, over time, experience increases in the population share of individuals receiving welfare transfers and decreases in the average number of hours worked by individuals. Aggregate output (GDP) will also decrease over time, if labor productivity is held constant, since fewer hours are worked. We have shown that, under plausible parameter values, the rate of taxation and the welfare expenditure share of GDP monotonically increase over time and asymptotically approach steady states. Our model implies that levels of redistribution will be "moving targets", which is consistent with an apparently insatiable demand for redistribution despite ongoing increases in redistribution.

Our model is a formalization of earlier insights by Lindbeck (1985) and North (1985), who suggested that changing tastes are a key factor in growth of government. We have found that holding productivity (i.e., technology) constant does imply lower rates of economic growth. However, so long as technology progresses more quickly than does external habit

[19] These two papers are based on fixed tastes and assumptions regarding the (dis)incentives to accumulate productive assets (including human capital) in the face of increasing taxes (redistribution). In the models, greater degrees of inequality in a community create incentives for the median voter to *vote* for growth-retarding redistribution. In both these models and ours, the redistributive policy is endogenous. The difference is that their welfare policy is motivated by incentives acting upon the median voter, whereas our model, in focusing specifically on external habit formation, ignores these particular political dimensions as well as those relating to the accumulation of (growth-enhancing) productive assets. We also note some recent empirical evidence that contradicts the fundamental premise of these papers: that a majority based on the median voter necessarily votes to transfer income to him or herself (see Milanovic, 2000). Furthermore, in our model, if productivity is exactly the same for everyone in a population (to take an extreme case), then no redistribution will arise. It is therefore the inequality in productive ("work") abilities that gives rise to the redistributive welfare policy, which, in turn, drives the interactive feedback loop that is deleterious to economic growth.

formation, the economy can continue to grow despite a decrease in the average number of working hours. Technological progress may therefore mask the underlying dynamic effects of the welfare state, which is an explanation for lack of a robust negative relationship in studies that attempt to link the level of welfare state expenditures to various economic performance measures.

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Appendix

To prove that $\partial \eta_\tau^* / \partial \bar{L}_{\tau-1} > 0$, we establish in this appendix that $\partial \eta_\tau^* / \partial \bar{L}_{\tau-1} > 0$. Eq. (8) characterizing the politico-economic equilibrium in period τ can be rewritten as $F(\eta_\tau^*, \bar{L}_{\tau-1}) \equiv \frac{1}{1+\eta_\tau^*} - \frac{2\eta_\tau^*}{\mu(\bar{L}_{\tau-1}) + \eta_\tau^*} \sqrt{\frac{1+\eta_\tau^*}{\eta_\tau^*}} = 0$, where $\mu(\bar{L}_{\tau-1}) \equiv \frac{1}{2}(\frac{1-\theta \bar{L}_{\tau-1}}{1-\theta \bar{L}_{\tau-1} - h})^{\beta/\alpha} > \frac{1}{2}$.

Note $t_\tau^* = \frac{\eta_\tau^*}{\mu(\bar{L}_{\tau-1}) + \eta_\tau^*}$. We obtain, $\frac{\partial F(\eta_\tau^*, \bar{L}_{\tau-1})}{\partial \eta_\tau^*} = -\frac{1}{(1+\eta_\tau^*)^2} - \frac{\mu(\bar{L}_{\tau-1}) + [2\mu(\bar{L}_{\tau-1}) - 1]\eta_\tau^*}{[\mu(\bar{L}_{\tau-1}) + \eta_\tau^*]^2 \sqrt{\eta_\tau^*(1+\eta_\tau^*)}} < 0$. On the other hand, it is easy to see that $\mu(\bar{L}_{\tau-1})$ is an increasing function of $\bar{L}_{\tau-1}$. By the implicit function theorem, we have, $\partial \eta_\tau^* / \partial \bar{L}_{\tau-1} = -\frac{\partial F(\eta_\tau^*, \bar{L}_{\tau-1}) / \partial \bar{L}_{\tau-1}}{\partial F(\eta_\tau^*, \bar{L}_{\tau-1}) / \partial \eta_\tau^*} > 0$.

References

Abel, A., 1990. Asset pricing under habit formation and catching up with the Joneses. American Economic Review, Papers and Proceedings 80, 38–42.

Agell, J., Lindh, T., and Ohlsson, H., 1997. Growth and the public sector: a critical review essay. European Journal of Political Economy 13, 33–52.

Agell, J., Lindh, T., and Ohlsson, H., 1999. Growth and the public sector: a reply. European Journal of Political Economy 15, 359–356.

Alesina, A., and Perotti, R., 1997. The welfare state and competitiveness. American Economic Review 87(5), 921-39.

Alesina, A. and Rodrik, D., 1994. Distributive politics and economic growth. Quarterly Journal of Economics 109(2), 465–490.

Alesina, A., Di Tella, R. and MacCulloch, R., 2004. Inequality and happiness: are Europeans and Americans different? Journal of Public Economics 88(9–10), 2009–2042.

Alesina, A., Sacerdote, B. and Glaeser, E., 2001. Why doesn't the US have a European-style welfare system? NBER Working Paper, No. 8524. National Bureau of Economic Research, Cambridge MA.

Andersen, T. M., 2004. Challenges to the Scandinavian welfare model. European Journal of Political Economy 20.

Auray, S., Collard, F. and Fève, P., 2002. Money and external habit persistence: a tale for chaos. Economics Letters 76, 121–127.

Barr, N., 1992. Economic theory and the welfare state: a survey and interpretation. Journal of Economic Literature 30(2), 741–803.

Bean, C., 1994. European unemployment: a survey. Journal of Economic Literature 32(2), 573–619.

Brinig, M. and Buckley, F., 1999. The price of virtue. Public Choice 98 (1–2), 111–129.

Buchanan, J. and Yoon, Y., 1994. Increasing returns, parametric work supply adjustment and the work ethic. In: Buchanan, J., Yoon, Y., (Eds.), The Returns to Increasing Returns. University of Michigan Press, Ann Arbor, pp. 343–358.

Campbell, J. and Cochrane, J., 1999. By force of habit: a consumption-based explanation of aggregate stock market behavior. Journal of Political Economy 107(2), 205-251.

Congleton, R., 1991. The economic role of a work ethic. Journal of Economic Behavior and Organization 15, 365–385.

Coughlin, P., 1986. Elections and income redistribution. Public Choice 50(1–3), 27–99.

Fölster, S. and Henrekson, M., 1999. Growth and the public sector: a critique of the critics. European Journal of Political Economy 15, 337–358.

Fölster, S. and Henrekson, M., 2001. Growth effects of government expenditure and taxation in rich countries. European Economic Review 45, 1501–1520.

Henrekson, M., 1996. Sweden's relative economic performance: lagging behind or staying on top? Economic Journal 106, 1747–59.

Hillman, A., 2003. Public Finance and Public Policy: Responsibilities and Limitations of Government. Cambridge University Press, New York.

Holsey, C. and Borcherding, T., 1997. Why does government's share of national income grow?: An assessment of the recent literature on the U.S. experience. In: D. Mueller (Ed.), Perspectives on Public Choice: A Handbook. Cambridge University Press, New York, pp. 562-589.

Husted, T. and Kenny, L., 1997. The effect of the expansion of the voting franchise on the size of government. Journal of Political Economy 105, 54–82.

International Labour Organization, 2004. Official website for ILO labor databases—Laborsta. http://laborsta.ilo.org/. Accessed on 29 April 2004.

Korpi, W., 1985. Economic growth and the welfare state: leaky bucket or irrigation system? European Sociological Review 1, 97–118.

Korpi, W., 1996. Eurosclerosis and the sclerosis of objectivity: on the role of values among economic policy experts. Economic Journal 106, 1727–46.

Ledyard, J., 1984. The pure theory of large two-candidate elections. Public Choice 44, 7–41.

Lindbeck, A., 1985. Redistribution policy and the expansion of the public sector. Journal of Public Economics 28, 309–328.

Lindbeck, A., 1993. The Welfare State: The Selected Essays of Assar Lindbeck, Vol. 2. Edward Elgar, Brookfield, VT, USA.

Lindbeck, A., 1997. The Swedish experiment. Journal of Economic Literature 35, 1273–1319.

Lindbeck, A., Nyberg, S. and Weibull, J., 1999. Social norms and economic incentives in the welfare state. Quarterly Journal of Economics 114, 1–35.

Lundberg, E., 1985. The rise and fall of the Swedish model. Journal of Economic Literature 33, 1–36.

Milanovic, B., 2000. The median-voter hypothesis, income inequality, and income redistribution: an empirical test with the required data. European Journal of Political Economy 16, 367–410.

Mueller, D., 2003. Public Choice III. Cambridge University Press, New York.

Nannestad, P., 2004. Immigration as a challenge to the Danish welfare state? European Journal of Political Economy 20.

North, D., 1985. The growth of government in the United States: an economic historian's perspective. Journal of Public Economics 28, 383–399.

OECD, 1996a. Economic Outlook (June). Paris.

OECD, 1997. Economic Outlook Historical Statistics: 1960–1995. Paris.

OECD, 1998. Employment Outlook (June). Paris.

OECD, 2001. Historical Statistics: 1970–2000. Paris.

OECD, 2003. OECD Employment Outlook–2003: Towards More and Better Jobs. Paris.

Olson, M., 1982. The Rise and Decline of Nations: Economic Growth, Stagflation, and Social Rigidities. Yale University Press, New Haven.

Paldam, M., 1997. Political business cycles. In: D. Mueller (Ed.), Perspectives on Public Choice: A Handbook. Cambridge University Press, New York, pp. 342–379.

Persson, T. and Tabellini, G., 1994. Is inequality harmful for growth? American Economic Review 84, 600–621.

Pierson, C., 1991. Beyond the Welfare State?: The New Political Economy of Welfare. Polity Press, Oxford.

Putterman, L., Roemer, J. and Silvestre, J., 1998. Does egalitarianism have a future? Journal of Economic Literature 36, 861–902.

Rosen, S., 1996. Public employment and the welfare state in Sweden. Journal of Economic Literature 34, 729–740.

Snower, D., 1993. The future of the welfare state. Economic Journal 103, 700–717.

Stephens, J., 1996. The Scandinavian welfare states: achievements, crisis, and prospects. In: Esping-Anderson, G. (Ed.), Welfare States in Transition. Sage, London, pp. 32–65.

Stigler, G., 1970. Director's law of public income redistribution. Journal of Law and Economics 13, 1–10.

Tanzi, V. and Schuknecht, L., 2000. Public Spending in the 20th Century: A Global Perspective. Cambridge University Press, Cambridge.

Tullock, G., 1974. More on the welfare cost of transfers. Kyklos 27, 378–381.

Tullock, G., 1981. The rhetoric and reality of redistribution.. Southern Economic Journal 47, 895–907.

Varian, H., 1980. Redistributive taxation as social insurance. Journal of Public Economics 14, 49–68.