WORK AND TELEVISION

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Abstract

In OECD countries watching television is by far the most time-consuming form of leisure. Surprisingly, television viewing is positively correlated with work hours across countries. A simple model based on the notion of aggregate strategic complementarities in social leisure is developed which explains such a pattern as resulting from multiple equilibria. Workers and capitalists are shown to exhibit opposite preference orderings over equilibria. The relative ability of those two groups in capturing a country's government may explain which equilibrium is selected.

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1 Introduction

The starting point of most investigations of labor supply is a model in which households allocate their time endowment choosing between market-based activities (work) and leisure. No attempt is usually made to discern the various activities people undertake during their free time. However, having a closer look at the ways in which people spend their free time seems worthwhile precisely because of its implications for labor supply. Individual decisions about the allocation of free time shape the possibilities of joint forms of leisure available to others and thereby affect the opportunity costs of working. Hence, international differences with respect to labor supply may reflect a variety of organizations of free-time activities, and those differences will be left unexplained unless one distinguishes between various uses of free time.

The current paper puts forward a distinction between two uses of free time: *solitary leisure* and *social leisure*. The first one refers to activities typically performed by a household independently of what other households do; the second one refers to activities jointly undertaken by members of two or more households. Television viewing is an example of solitary leisure. Social leisure includes things like personalized interactions with friends and neighbors, and the participation in the life of clubs, religious bodies, political parties, unions and various civic organizations.

Time-diaries studies indicate that the aforementioned distinction is empirically relevant. According to U.S. studies, television viewing is by far the most time-consuming form of leisure and socializing outside the household ranks second, see Robinson and Godbey (1997, p. 125); similar findings are reported for other countries.

From an allocative point of view, the main difference between solitary and social leisure is that the benefits derived from the latter directly depend upon the behavior of others - i. e. externalities are at work - whereas this is not the case for solitary leisure. Potentially, those externalities can lead to considerable misallocations and

greatly change our understanding of the welfare costs determined by policies which alter the opportunity costs of time uses, e. g. a wage tax.

While international differences in the length of work hours are well documented, relatively little is known on international differences in the use of free time. Due to the lack of a comprehensive international data set about the allocation of free time, only very few countries can be compared on the basis of time-diaries studies. Systematic comparisons are however possible with respect to television viewing - largely as a result of the interest of advertisers for audience data. IP (1998 and 2001), a publication that draws from international media rating services, delivers average daily viewing time per individual in minutes for a number of years and countries. Viewing data are collected and processed with the help of an electronic device, the "people meter", deployed in a large number of representatively sampled households.[1] According to IP data for 2000, the average viewing time per adult is in almost all countries more than 150 minutes per day; the U.S. exhibit the longest television viewing time, the average adult spending daily 262 minutes watching television at home.

Figure 1 exhibits a scatter plot of the data about television viewing, coupled with data on work hours. The statistical indicator of the time spent on work is average annual hours actually worked per person in employment, as reported by the OECD. All countries and years which are available in both the IP and OECD data sources have been used. Two remarkable features emerge from inspection of Figure 1. First, patterns of television viewing and working hours are quite different across

[1]By requiring viewers to actively report when they are viewing, the people meter considerably improved the accuracy of the viewing estimates as compared to the previously used "Nielsen audimeter". Estimates by the people meter are likely to reflect the time spent on television viewing as a primary activity, i.e. as an activity receiving the major attention of the individual rather than simply having the set on.

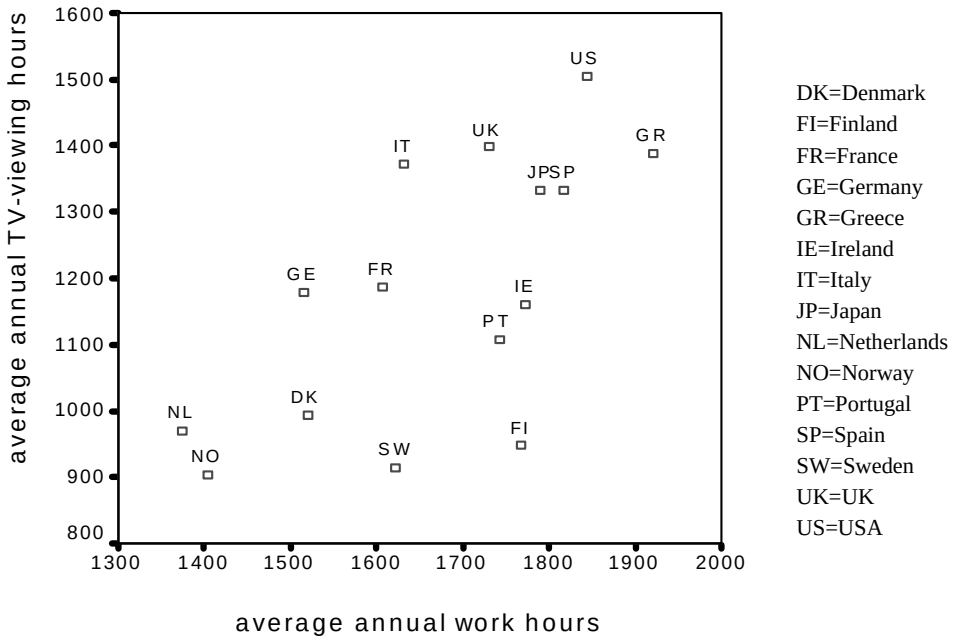

Figure 1: Average annual hours of work and television viewing, 1994–2000. Data for Greece and Portugal do not cover the entire period.

different countries. A closer look at the data reveals that those patterns are rather stable in each country over the various years. The second striking feature is that television viewing and work hours are positively correlated. The country averages of TV-viewing hours per adult and work hours per person in employment exhibit a coefficient of correlation of 0.66. The existence of a positive correlation is confirmed by computing a regression line based on all annual observations. Unreported OLS estimations of television viewing time show that the coefficient on the working time variable exhibits a positive sign and is strongly statistically significant.[2]

[2] A positive correlation is also found if working hours are averaged on the overall adult population, which takes the different employment rates of the various countries into account.

The positive cross-country correlation between television viewing and working time is surprising since the longer one of those activities is, the shorter is the available time for the other one. That is why one would rather expect to see a negative correlation between the two. Indeed, Gronau and Hamermesh (2001), Juster and Stafford (1991), and Robinson and Godbey (1997) report evidence that indicates a negative correlation at the individual level. By way of an example, in the U.S., individuals with a more than 60 hour workweek reported in 1985 half as much television viewing as those not employed [Robinson and Godbey (1997, p. 148)].

In the current paper a simple model of solitary and social leisure is developed, which offers a rationale for these stylized facts. The model captures in a reduced form strategic complementarities that arise in the organization of social leisure. If these complementarities are strong enough, a concern for socially enjoyed leisure gives rise to multiple equilibria. Equilibria with little social leisure but long hours of work and television viewing coexist with equilibria in which there is much social leisure along with short hours of work and television viewing. This analytical framework can thus rationalize the positive correlation between television viewing and working time as stemming from the selection of different equilibria in a situation in which several ones exist.[3]

If only worker households are considered, equilibria can be Pareto ranked by their amount of social leisure, and the equilibria with longer hours of work and television viewing can be seen as the result of a coordination failure. Considering also capitalists shows that their preferences over equilibria are the opposite of workers' preferences.

[3]There is a parallel between this interpretation of cross-country evidence and Putnam's (2000, ch.15) interpretation of the 1965-2000 decline of social connctedness and civic engagement in the U.S. He estimates that 25 percent of that decline is attributable to the rise of television viewing and 10 percent to increased time devoted to work, following the emergence of two-career families. He attributes most of the remaining decline to generational change.

The relative ability of capitalists and workers in effectively capturing a country's government may explain which equilibrium is selected.

In Sect. 2 the formal model is developed and its main properties are derived. Sect. 3 deals with the issue of equilibrium selection. A concluding discussion is offered in Sect. 4, where alternative interpretations of the stylized facts are scrutinized.

2 A simple model with multiple equilibria

A useful way to think of social leisure is to see it as a bunch of time uses directed at the consumption of *relational goods*.[4] The distinctive trait of relational goods is that an agent's consumption of those goods increases with the amount of time the agent devotes to socializing as well as with the socializing effort expended by other agents.

Two types of external effects may be distinguished. First, there is an externality in the formation of an agent's social network, i.e. the group of persons with whom actual socializing takes place. Creating social ties gives rise to positive externalities in quite the same fashion as job search does in labor markets with mobility costs. All networks are subject to a risk of termination, e.g. because an agent moves to a different location. With imperfect information flows, building a network requires that an agent spends some time in collecting decisionally relevant information: the agent has to spend some time in order to meet potential interactants, screen them, and being screened by them. The probability of a successful match increases with the time the agent devotes to searching for partners. However, the quality of the match will also be higher, the more time the remaining agents devote to search. Spending an entire evening in a bar will not improve one's social contacts if nobody else turns up.

[4]This terminology is due to Uhlaner (1989).

A second type of externality concerns the efforts exerted by members of a given social network in order to cultivate their skills as partners. Social skills are in part relation-specific, i.e. not valuable outside a given social network and the involved external effects are similar to those generated by effort decisions in a work team. Agents are likely to derive a larger satisfaction from their social contacts if they devote more time to prepare for high-quality interactions; at the same time, agents benefit from the investment in interaction skills made by other members of the network. Examples may range from contributing a dish to a neighborhood dinner to empathizing by imaging yourself in a friend's shoes.

The following model incorporates relational goods into the consumption set of households and captures, in a reduced form, the aforementioned externalities.

2.1 Assumptions

The economy consists of a set of households $H = [0, 1]$ endowed with Lebesgue measure μ. A household's type is denoted by i and its preferences are represented by the following utility function:

$$U(i) = U_i(c_1(i), ..., c_J(i), z(i), x(i)) \tag{1}$$

where the c_j $(j = 1, ..., J)$ are quantities consumed of J goods, z is the amount of television viewing, and x represents the amount of relational goods consumed by the household. The utility function is increasing in all its arguments and continuous.

Relational goods are produced by the socializing efforts exerted by the household, s, and by the average socializing effort in the population, $S = \int_H s d\mu$, according to:

$$x(i) = G_i(s(i), S, c_1(i), ..., c_J(i)), \tag{2}$$

where the function G_i is strictly increasing in its first two arguments and continuous.

Households maximize their utility function subject to the relational technology (2), a budget constraint, and a time constraint. The budget constraint reads

$$\sum_{j=1}^{J} p_j c_j(i) = wl(i), \tag{3}$$

where l is supplied labor and w is the wage rate, which is used as the numéraire price: $w = 1$.[5] The time constraint can be written as

$$\sum_{j=1}^{J} t_j c_j(i) + z(i) + s(i) + l(i) = T(i), \tag{4}$$

where t_j denotes the time coefficient of one of the J consumption activities and $T(i) < \infty$ is the total time available to the household. This formulation of preferences and constraints encompasses the consumption of products which do not use time as an input ($p_j > 0$, $t_j = 0$) as well as multiple forms of solitary leisure ($p_j = 0$, $t_j > 0$).

There are J competitive industries producing the consumption goods, each industry produces only one output. Labor is the only production factor and technologies exhibit constant returns to scale.

2.2 Determination of equilibrium

With profit maximizing firms, the conditions of the nonsubstitution theorem hold. Hence, equilibrium prices for the J consumption goods are entirely determined by the technology.

Households' equilibrium behavior meets two requirements: First, the allocation of the available time by each household maximizes its utility function (1) subject to the constraints (2), (3) and (4), taking S as given. Second, S equals the average socializing

[5] One can easily extend the model to encompass positive, possibly nonlinear, prices for television viewing and the socializing activity. I omit them to spare on notation. Those prices would not alter the results concerning the multiplicity of equilibria and their ranking.

effort chosen by the households. Because of this interdependence, the model implicitly defines a game with a continuum of players. Determining the equilibrium of the model boils down to establishing the (pure-strategy) Nash equilibrium of this game.

Property 1. *An equilibrium always exists.*

Proof. Subtituting $l(i)$ out of (4) into (3) yields

$$z(i) = T(i) - \sum_{j=1}^{J}(p_j + t_j)c_j(i) - s(i). \tag{5}$$

Subsitution of (2) and (5) into (1) leads to

$$U(i) = U_i\left(c_1(i), ..., c_J(i), T(i) - \sum_{j=1}^{J}(p_j + t_j)c_j(i) - s(i), G_i(s(i), S, c_1(i), ..., c_J(i))\right) \tag{6}$$

This is a function of the decision variables $c_1(i), ..., c_J(i)$ and $s(i)$, and of the average socializing effort S, as well as the exogenous parameters p_j, t_j and $T(i)$. Write this objective function as

$$U(i) = V_i\left(c_1(i), ..., c_J(i), s(i), S\right).$$

Since both G_i and U_i are continuous, V_i is continuous. Furthermore, the space on which the decision variables are defined is compact because the total time available, $T(i)$, is finite. It follows that a pure strategy Nash equilibrium of the corresponding nonatomic game exists, see Rath (1992, Theorem 2). □

An equilibrium requires that households maximize their utility taking the average social leisure in the popoulation as given. Let $s_i^*(S)$ denote the best reply with respect to the socializing effort and $S^*(S)$ denote the average best reply: $S^*(S) = \int_H s^*(S)d\mu$. Similarly denote by an asterisk and an uppercase letter the average best reply with respect to the other choice variables. Assume for simplicity that all average best reply functions are differentiable.

Property 2. *If $dS^*/dS > 0$, multiple equilibria are possible.*

Proof. Each root of the equation $S^*(S) - S = 0$ defines an equilibrium. Multiple roots are possible if S^* is increasing. □

The reason for equilibrium multiplicity is simple: the incentive to look for social contacts is strong when the general level of social leisure is large and it is weak when socializing efforts by others are modest. Multiple equilibria are possible if these aggregate strategic complementarities are strong enough.[6]

Both television viewing and working are alternative ways to use that part of the time endowment which is not devoted to social leisure. If those activities expand whenever the time for social leisure is reduced, television viewing and working hours move together across equilibria.

Property 3. *If $dZ^*/dS < 0$ and $dL^*/dS < 0$, average television viewing and work hours are positively correlated across equilibria.*

Independently of how aggregate best replies look like, equilibria can be ranked in efficiency terms:

Property 4. *Whenever there are two equilibria with different average social leisure, the one with more of it Pareto-dominates the other one.*

Proof. Take two different equilibria S_1^* and S_2^*, with $S_2^* > S_1^*$. Since for each household the utility function (6) increases with S, the value of the maximized utility function is larger under S_2^* than under S_1^*. □

If $dL^*/dS < 0$, equilibria with a lower output level Pareto-dominate those with higher output levels. In that case, the equilibrium relationship between GDP and welfare is the opposite of the one which is usually assumed.

[6] Cooper and John (1988) have highlighted the importance of strategic complementarities with respect to individual best replies as a basis for macroeconomic coordination failures. In the current model, only strategic complementarity with respect to aggregate best replies is required to generate multiple equilibria.

2.3 A Cobb-Douglas Example

The following example illustrates the properties of the former model in a special case where best replies conform to those posited in Property 3 and multiple equilibria do arise.

Assume that there is only one consumption good and the only form of solitary leisure is television viewing; utility is given by

$$U(i) = c(i)^{\alpha_i} z(i)^{\beta_i} x(i)^{\gamma_i}. \tag{7}$$

The relational goods are produced by the socializing efforts exerted by the household and by the average socializing effort in the population according to

$$x(i) = S^n s(i)^{g(S)}, \tag{8}$$

where the function $g(S)$ is continuous, positive and strictly increasing; the parameter n is assumed to be so large that x increases with S almost everywhere.[7]

The household's budget constraint reads

$$c(i) = wl(i), \tag{9}$$

where the consumption good is now used as the numéraire.

The time constraint can be written as

$$z(i) + s(i) + l(i) = 1, \tag{10}$$

where total available time is normalized to unity and it is assumed that the consumption good does not require time in order to be consumed.

[7] The following can be shown: For any $\epsilon > 0$, arbitrarily small, it exists a finite $\widetilde{n} > 0$ such that $x(i)$ strictly increases with S for any $S \in [0, 1]$ and for any $s(i) \in [\epsilon, 1]$ if $n \geq \widetilde{n}$; the smaller is ϵ, the larger is $\widetilde{n}$.

In order to determine the equilibrium, use (7), (8), (9) and (10) to rewrite the individual optimization problem as:

$$\max \alpha_i \ln c(i) + \beta_i \ln z(i) + \gamma_i g(S) \ln s(i) + \gamma_i n \ln S$$

subject to:

$$c(i) + wz(i) + ws(i) = w.$$

For given S, a household's optimal choices are

$$c_i^* = \frac{\alpha_i w}{\alpha_i + \beta_i + \gamma_i g(S)} \tag{11}$$

$$z_i^* = \frac{\beta_i}{\alpha_i + \beta_i + \gamma_i g(S)} \tag{12}$$

$$s_i^* = \frac{\gamma_i g(S)}{\alpha_i + \beta_i + \gamma_i g(S)}. \tag{13}$$

The average best reply with respect to socializing effort is therefore

$$S^*(S) = \int_H \frac{\gamma_i g(S)}{\alpha_i + \beta_i + \gamma_i g(S)} d\mu. \tag{14}$$

Since $S^* : [0,1] \to [0,1]$ is continuous, the existence of a pure strategy Nash equilibrium directly follows from Brower's fixed-point theorem.

The set of the equilibrium points is determined by equation (14). Given an equilibrium level of S, individual behavior is uniquely determined by (11), (12), (13), and

$$l_i^* = 1 - z_i^* - s_i^*. \tag{15}$$

Since function g is strictly increasing, $S^*(S)$ is strictly increasing too and multiple equilibria may arise. Suppose, by way of an example, that households have identical

tastes $\alpha_i = 15$, $\beta_i = 15$, $\gamma_i = 1$, $\forall i$, and $g(S)$ is the quadratic function

$$g(S) = 150S^2 + S + 1.$$

Finding the equilibria of the models boils down to determining the roots of a cubic equation ensuing from (14):

$$150S^3 - 149S^2 + 30S - 1 = 0.$$

There are three equilibria: $S_1^* \approx 0.04$, $S_2^* \approx 0.22$ and $S_3^* \approx 0.73$. It can be shown that the equilibria S_1^* and S_3^* are stable, whereas S_2^* is an unstable equilibrium.

Substituting (12) and (13) into (15) one can compute equilibrium work hours to be

$$l_i^* = \frac{\alpha_i}{\alpha_i + \beta_i + \gamma_i g(S)}. \tag{16}$$

Since $g(S)$ is strictly increasing, equilibria with more social leisure have less time spent at work. By (12), equilibria with more social leisure also have less television viewing. Hence, equilibria with longer work hours also display longer television viewing.

The current model puts no restriction on the correlation between television viewing and working time across households. At a given equilibrium, it is possible for television viewing and working time to be negatively correlated across households, similarly to what has been found by country studies. By way of an example, if households only differ with respect to their taste for television, i. e. $\alpha_i = \alpha$ and $\gamma_i = \gamma$, $\forall i$, while β_i varies across households, television viewing and working time are negatively correlated across households, as shown by equations (12) and (16).

3 Equilibrium selection

The above model portrays equilibria with long work hours and television viewing as a coordination failure based on complementarities in socializing efforts. As any other

model of coordination failure, the current one may be criticized on the following ground: with gains from coordination, people should eventually manage to find a way of coordinating complementary activities.

In the current setting, decentralized moves towards a Pareto-superior equilibrium seem unlikely because they require the coordination of a very large number of agents. In modern societies, the environment to which people are exposed is extremely variegated and social networks have got enormously large. Coordination to an equilibrium with a larger consumption of relational goods is thus severely limited by the transaction costs and free-riding incentives that are associated with large groups.

Differences with respect to equilibrium selection may be explained by differences in public policy. For example, in some countries mandatory reductions of work hours might have eliminated some inferior equilibria.[8] This is possible even if legal restrictions on the duration of working time are difficult to enforce for a number of jobs, like those of managers and the self-employed. If social ties are not fully compartmentalized across professional groups, the reduction of work hours for a large subgroup of the population may create a bandwagon effect: since a larger pool of potential social contacts is available, those who are not subject to legal restrictions on work hours may now *choose* to reduce their working time. A second example is income redistribution: progressive income taxation may make equilibria with much social leisure more likely by penalizing overwork.

If the government is able to select an equilibrium, why does one observe something like a "television and work equilibrium" in some countries?

The previous model only considered worker households, and showed that a Pareto ranking of the equilibria existed with respect to those households' preferences. In

[8]In a recent paper, Burda and Weil (2001) show that legal restrictions on shop-opening hours affect the way households use their free time. In that paper a distinction is made between solitary leisure and common leisure, which is similar to the one used here.

what follows it is shown that considering also capitalists substantially alters the picture, because capitalists and workers tend to have opposite preferences over equilibria. Since the influence of workers and capitalists upon the government varies across countries, this might explain the variability in observed behavior; for example, it might explain the difference between a country like the U.S., in which the balance of power is more in favor of capital, and a country in which the balance of power is more in favor of labor, like a Scandinavian one (see Figure 1). This explanation is consistent with accounts of class warfare in various countries; e. g., Schor (1991) points out various strategies that were adopted by business in the U.S. to oppose reductions of the workweek.

The impact on factor prices

Capitalists may be defined as those who own the fixed capital used by firms or as those who own the firms. To begin with, let capitalists be defined as the owners of the capital stock. The equilibrium preferred by the capital owners is the one with the largest labor supply since this is the one which induces the highest remuneration of capital.

To see this formally, suppose, without loss of generality, that there is only one consumption good and this good is produced using labor and capital. Let $F(K, L)$ denote the aggregate production function, where K stays for capital. Assume that the entire capital stock be owned by absentee capitalists, so that household behavior is determined exactly like in the model above.

With competitive factor markets, capital earns its marginal product:

$$r = F_K(K, L) = f'(k),$$

where k denotes capital intensity and $F(K, L) = Lf(k)$ because of constant returns.

An increase in labor supply benefits capitalists because it intensifies the relative scarcity of capital:

$$F_{KL}(K,L) = -\frac{kf''(k)}{L} > 0.$$

The impact on pure profits

The equilibrium preferred by the owners of firms is the one with the largest labor supply since this is the one which leads to the highest profits.

To illustrate the basic idea, consider again the case where labor is the only production factor and assume that each unit of any consumption good requires one unit of labor to be produced. Suppose however that product markets are imperfectly competitive: each of the J industries only has one firm, which sets the price of its product so as to maximize its profit. Firms' profits accrue to absentee owners.

The utility function (1) is now specialized to:

$$U(i) = \left[\frac{\sum_{j=1}^{J} c_j(i)^{(\theta-1)/\theta}}{J}\right]^{\alpha\theta/(\theta-1)} z(i)^{\beta} x(i)^{\gamma} \tag{17}$$

where $\theta > 1$.

Households maximize their utility function taking the following constraints into account: the relational technology (8); the budget constraint (3), where the wage rate is used as the numéraire price: $w = 1$; the time constraint (10).

By standard techniques the following household's demand function can be obtained:

$$c_j(i) = \frac{l(i)}{p_j^{\theta} \sum_{y=1}^{J} p_y^{1-\theta}}.$$

The demand function faced by firm j is therefore

$$C_j = \frac{L}{p_j^{\theta} \sum_{y=1}^{J} p_y^{1-\theta}}.$$

The resulting expression for profits reads

$$\pi_j = \frac{(p_j - 1)L}{p_j^\theta \sum_{y=1}^J p_y^{1-\theta}}.$$

Each firm chooses its own price in order to maximize profits; the f.o.c. of that problem is given by

$$\left(\sum_{y=1}^J p_y^{1-\theta}\right) p_j^\theta = (p_j - 1)\left(1 - \theta + \theta p_j^{\theta-1} \sum_{y=1}^J p_y^{1-\theta}\right).$$

In a symmetric Nash equilibrium is $p_j = p$, $\forall j$, by which

$$p = \frac{1 + \theta(J-1)}{(J-1)(\theta - 1)} > 1 \tag{18}$$

obtains. Each household thus consumes $c(i) = l(i)/(Jp)$ units of each product. As the J products are consumed in equal amounts, the utility function (17) can be rewritten as

$$U(i) = c(i)^\alpha z(i)^\beta x(i)^\gamma.$$

Maximization of this utility function subject to the three usual constraints leads to the same expression for $z(i)$, $s(i)$ and $l(i)$ as in the previous Cobb-Douglas example. Again, multiple equilibria arise in which television viewing and work hours are positively correlated. In an equilibrium, aggregate labor supply is

$$L = \frac{\alpha}{\alpha + \beta + \gamma g(S)}$$

and aggregate profits are given by

$$\Pi = J\pi_j = \left(1 - \frac{1}{p}\right) L,$$

where p is determined by (18). According to the last two equations, equilibria with little social leisure go along with a larger labor supply, which in turn increases product demand and the profit of firms.[9]

[9] Arguably, a second channel exists if television viewing affect the viewers' tastes. Suppose,

4 Concluding remarks

Individuals devote a considerable amount of time to television viewing: on average, watching the box roughly absorbs as a large share of one's lifetime as working. Interestingly, the time people spend on work and the time people stay tuned are positively correlated across countries: the longest hours are worked in countries where people spend most of their free time in front of the screen. In the current paper a model based on aggregate strategic complementarities in the provision of relational goods has been developed, which can explain that finding.

The lack of systematic international data on the use of free time prevents one from testing the prediction of a negative correlation between social leisure and the length of television viewing. Leisure is a fragmented field that is not recognized as a policy area yet, so that data on leisure time are generally not regarded as international key statistics. Fortunately, work is now being done to harmonize definitions and calculations, so that comparable data may be available in the future, see Van den Broek (2002).

The final issue to be addressed in this paper is: Are there ways to account for the positive correlation between television viewing and working time that do not require positive externalities in the provision of relational goods? I now turn to three such

following Dixit and Norman (1978), that because of exposure to advertising, heavier television viewing leads to an increase in the perceived differentiation of products:

$$\theta_i = v(z(i))$$

with $v' < 0$. According to this formulation, television viewing decreases the elasticity of substitution between products without affecting the level of utility enjoyed by the consumer; hence decisions about television viewing are not altered by its posited effect upon tastes. Equilibria with little social leisure and much television viewing are preferred by capitalists because each firm has more monopoly power and a higher price level obtains ($dp/d\theta < 0$).

explanations which, by not positing relational externalities, have markedly different normative implications.

All explanations to be discussed start with the fact that countries display different hours of work, e. g. because of differences in policy parameters, and point out mechanisms which may lead to a positive correlation between hours of work and hours of television viewing across countries. I contend that although each explanation retains some plausibility, no one is completely successful in rationalizing the stylized facts.

Programming quality

Television programs are nonrivalrous consumption goods, which are often financed through general taxation, in the case of public channels, and through advertising, in both cases of public and private channels. Because of this public good aspect, countries with a large population are in a better position to finance television channels and to raise the quality of programming; hence, big countries may be expected to have better programs and longer television viewing. If large countries happen to display long hours of work and if differences in television quality are sufficiently large, one may obtain as a result a positive correlation between television viewing and working time.

This explanation can account for the fact that the Scandinavian countries have low levels of television viewing, whereas in the U.S. and Japan, where the programming variety available to most viewers is very large, the levels of television viewing are also large - see Figure 1. A problem with this explanation is that some countries do not conform with it, for instance Greece has about the same population as Sweden, but Greece exhibits a very large level of television viewing. Another problem may be the difficulty in proving the quality differences in programming, e. g. showing that U.S. viewers are exposed to a much higher television quality than, say, viewers in the Netherlands.

Television as rest

Several activities require not only time but also some special concentration to be carried out successfully. Furthermore, individuals have a limited amount of such a resource: there may be a psychic-energy constraint to which individual decisions are subject. Among the activities requiring much psychic energy may be work and some forms of leisure, like debating and playing cards, whereas watching television may require a very small amount of concentration. Then, individuals who work a lot have little psychic energy left for leisure activities: in their short free time they turn to the screen and avoid psychically demanding activities. If this change in the allocation of the available free time compensates the diminished amount of free time due to increased work hours, a positive correlation between television viewing and working time can arise.

This explanation can account for the pattern observed in Figure 1, i.e. the positive correlation across countries. However, it does so by predicting a positive correlation at the individual level, whereas time-budget surveys find a negative one.

Socializing at work

Most work is rated quite highly in terms of inherent enjoyability of time, partly due to pleasant interactions with coworkers. This shows that people also consume relational goods while being at work. If a long workday leads to much socializing at work, off-work socializing is less attractive for those with the longest work hours. Hence these individuals may be expected to have a small share of free time devoted to social leisure and a large share devoted to solitary leisure, especially television viewing. If this effect upon the composition of free-time activities compensates the smaller amount of free time available, a positive correlation between television viewing and work hours can arise.

This explanation is consistent with Figure 1 but it suffers from the same drawback as the previous explanation: it accounts for the positive correlation across countries

by justifying a positive correlation across individuals, whereas the evidence indicates a negative correlation across individuals. Furthermore, it is not clear that jobs with long hours are really conducive to especially warm relationships between workmates and a large consumption of relational goods.

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