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# INCENTIVES FOR THE HOMOGENIZATION OF TIME USE

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## ABSTRACT

An increasing variety of phenomena involve the mixing of market work and leisure, or market work and home production, both by individuals and across household members. The growth of vacations, holidays and days absent from work; the rise in part-time employment and the reduction in moonlighting; and the convergence between the sexes of labor-force participation rates and of time spent in household production, are all demonstrated by data for a number of developed countries. This phenomenon, an increasing consumption of mixed leisure, is examined in the context of a model in which the consumption of one commodity reduces the market wage. If income dominate substitution effects, as time-series evidence on the demand for leisure suggests they do, higher full incomes will increase the demand for mixed leisure. Similarly, greater differences between tax rates on market work and on mixed leisure will also increase the demand for the latter.

Whether the growth of mixed leisure has resulted from changing tax incentives or increased full incomes is not clear, but some weak formal evidence for the latter cause is presented. The implications of expanded consumption of mixed leisure for earnings inequality and for the welfare effects of unemployment are discussed, and some approaches to testing the theory of the demand for mixed leisure are suggested.

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> For many ages to come the old Adam will be so strong in us that everybody will need to do some work if he is to be contented.... But beyond this, we shall...make what work there is still to be done to be as widely shared as possible. Three-hour shifts or a fifteen-hour week may put off the problem for a great while. (Keynes, 1930, p. 369)

## I. Introduction

Keynes' well-known prediction about the path of labor supply has hardly come to pass in the adulthood of his contemporaries' grandchildren. Either the "old Adam" is much stronger than Keynes imagined (people's tastes differ sharply from what he believed them to be), or other incentives have changed. The average workweek has not dropped to 15 hours, though there is some evidence (Beckerman, 1978) that the average amount of market work per adult fell slightly in most industrialized countries from the early 1950's at least up through the early 1970s.

What is more interesting than this (fairly slow) rate of growth in per-capita leisure is the enormous range of changes in patterns of leisure. In this study I present evidence of the variety of these changes, each of which can be characterized as evidence of an increase in people's interspersing leisure and market work. I then discuss a simple theory that can incorporate the changing incentives that can account for them and that has explicit predictions for future changes in patterns of consumption of leisure. Moreover, the unifying view it provides of the use of time in industrialized societies offers implications for changes in the inequality of earnings and in the burden of unemployment.

## II. Changes in the Allocation of Time

The supply of labor to the market expresses itself along a variety of margins. Elsewhere (Hamermesh-Rees, 1984) we have categorized these as the

choices of participation, of hours of work given participation, and of effort per hour of work. While all three obviously come from the same maximizing decision, this hierarchy provides a useful way of examining how the allocation of time to the market has changed in industrialized countries. In this section we thus examine data from a variety of sources on changes in time use in the last thirty years.

Table 1 presents labor-force participation rates for adult men and women in 1959 (for most countries) and 1981. The pattern for adult women is striking and both well known and widely studied. Except for Japan and (barely) Austria the data show an increased fraction of adult women are working in the market.[1] What is less well known is that the fraction of adult men who are in the labor force has declined in each of these countries. There has been a trend toward convergence of time allocated to the market by the two sexes.

Examining the allocation of time during the work year for those persons in the labor force, we see from Table 2 that paid days off (public and other holidays) have increased. Also, the amount of vacation time available to regular workers has risen. The payroll cost figures for the United States suggest the increased consumption of vacation time is not so sharp as the data from Canada and the United Kingdom on its availability would imply; however, both do indicate that workers are interspersing weeks of paid work with weeks of paid leisure to a greater extent than they did 25 years ago.

Perhaps the biggest change in time allocation has been the decline in scheduled hours of work per working person. As Table 3 shows, this decline is not merely the result of the interaction of labor supply and technology: The fraction of workers holding second jobs has declined in the industrialized countries for which data are available.[2] Similarly, though clearly somewhat more the result of an interaction of supply and demand, Table 4 indicates that there has been a rise in part-time work in the past 20 years. Finally, even within manufacturing Table 5 shows that scheduled weekly hours have fallen in

Table 1.

Labor-Force Participation Rates, 1959, 1981, Persons 15-64

| | Males | | Females | |
|---|---|---|---|---|
| Country | 1959 | 1981 | 1959 | 1981 |
| United States | 91.7 | 85.1 | 44.6 | 60.7 |
| Canada | 92.2 | 86.0 | 30.6 | 58.4 |
| Austria--a | 88.6 | 81.6 | 50.4 | 49.6 |
| Belgium | 88.5 | 80.0 | 36.4 | 48.7 |
| Denmark--b | 99.5 | 88.3 | 43.5 | 71.8 |
| FRG | 95.2 | 82.3 | 48.8 | 50.1 |
| Finland | 91.4 | 79.0 | 64.0 | 68.5 |
| France--a | 87.4 | 81.3 | 46.1 | 52.5 |
| Italy--c | 88.3 | 82.8 | 32.1 | 40.5 |
| Norway | 93.0 | 87.5 | 36.2 | 64.2 |
| Spain--b | 99.8 | 80.6 | 23.6 | 31.7 |
| Sweden--c | 91.6 | 86.5 | 53.9 | 75.3 |
| United Kingdom | 99.3 | 86.7 | 47.4 | 56.9 |
| Australia -c | 94.3 | 87.5 | 38.6 | 51.8 |
| Japan | 91.6 | 89.3 | 59.8 | 55.2 |

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a--For 1968
b--For 1960
c--For 1964
SOURCE: OECD, Labor Force Statistics, 1959-70, 1964-75, 1970-81

Table 2.

Paid Vacations and Days Off, United States, Canada and United Kingdom, 1955 and 1977

| Country | 1955 | | 1977 | |
|---|---|---|---|---|
| | Days Off | Vacations | Days Off | Vacations |
| United States (percent of payroll) | 2.0 | 3.0 | 3.2 | 4.9 |
| Canada (percent of workers) | | | | |
| Plant | 2 | 7 | 77 | 86 |
| Office | | | | |
| United Kingdom (percent of workers) | --- | 1 | --- | 81 |

SOURCE: U.S. Chamber of Commerce, Employee Benefits, 1975, 1977
Canada Year Book, 1960, 1980-81; data on days off are for 10 or more paid days; data on vacations are for 4 or more weeks paid
British Labour Statistics Year Book, 1976; data are for more than 3 weeks paid

Table 3.

Multiple Job Holding Rate (Percent of Workers)

| Country | 1960s | Late 1970s or 1980 |
|---|---|---|
| United States (1963, 1980) | 5.7 | 4.9 |
| Belgium (1968, 1979) | 4.2 | 2.1 |
| Italy (1968, 1979) | 2.2 | 2.0 |
| United Kingdom (1966, 1979) | 2.8 | 1.5 |
| Japan (1965, 1979) | 7.0 | 6.7 |

SOURCE: J. Alden and R. Spooner, Multiple Job Holders. Luxembourg: Eurostat, 1982. U.S. Bureau of Labor Statistics, Special Labor Force Report No. 221, and Monthly Labor Review, May 1982

Table 4.

Part-Time Workers as a Percent of Total

| Country | Males | Females |
|---|---|---|
| United States (labor force) | | |
| 1963 | 3.7 | 19.3 |
| 1981 | 8.6 | 23.2 |
| Canada (employed) | | |
| (Sept 1971) | 6.2 | 24.6 |
| (Sept. 1983) | 7.8 | 25.6 |
| FRG (employed) | | |
| 1961 | | 11.3 |
| 1979 | | 27.6 |
| United Kingdom (employed) | | |
| 1961 | | 8.0--a |
| 1975 | | 16.9--a |

a--All workers

SOURCE: United States, Handbook of Labor Statistics; Employment and Earnings. Part-time is usual work or work sought <35 hours per week.
Canada, The Labour Force. Part-time is usual work <35 hours per week in 1971, <30 hours per week in 1983.
FRG, Hallaire (1968); OECD, Labor Force Survey, 1979.
United Kingdom, Hallaire (1968); Robinson (1979)

Table 5.

Manufacturing Hours (Per Week, Except per Day in Italy)

| Country | 1958 | 1981 |
|---|---|---|
| United States--a | 39.2 | 39.8 |
| Canada--a | 40.2 | 38.5 |
| FRG--a | 45.5 | 41.1 |
| France--b | 45.3 | 40.3 |
| Italy--b | 8.02 | 7.73 |
| Norway--b | 44.8 | 39.9 |
| United Kingdom--b,c | 47.3 | 42.0 |
| Japan--b | 46.5 | 41.0 |

a--Hours paid for.
b--Hours actually worked
c--Men only

SOURCE: ILO, Year Book of Labour Statistics, 1965, 1982

most countries. The small changes in the United States and Canada, which had relatively short hours in the late 1950s, suggest the existence of some, perhaps only temporary, lower limit to the scheduled workweek in this sector.

The evidence in Tables 3-5 may merely indicate the predominance of income over substitution effects in the demand for leisure. However, it should be considered in conjunction with Beckerman's (1978, p. 15) evidence of a very slow increase in the consumption of leisure per adult (and an actual decline in the United States, Canada and France) between the early 1950s and the 1970s. Viewed in this way, the decline in scheduled hours implies that the incidence of market work among the adult population in any given week has increased, but the weekly duration of market work has declined.

One might expect that declines in morbidity rates would have led to decreases in absenteeism. As Table 6 shows, except in the United States the opposite has been true.[3] Taylor (1969) shows similar upward trends for the United Kingdom, Germany, Sweden and Italy from 1950 to the middle 1960s. This surprising trend may partly reflect the reduced cost of absenteeism, as limits on paid sick leave have increased (see Doherty, 1979). Even if it does, though, the greater prevalence of this fringe benefit may itself be partly the outcome of workers' desires to alternate leisure with market work, partly the result too of rising tax rates on earned income. It is especially interesting to note the increase in the United States between the two business-cycle peaks in the 1970s in the rate of unexcused absences not resulting from illness. This rise is not likely to be contaminated by any changes in the cost to the worker of being absent or in underlying morbidity rates.

Even within a day there have been clear changes in how people allocate their time between market work and work in the household. Table 7 presents data on this aspect of labor-market behavior for five countries. Perhaps the clearest example of the changes that have occurred is shown for Norway: During the 1970s the average man sharply reduced the time spent at market work, but

Table 6.

Days of Absence Due to Illness

| Country | Early Year | Recent Year |
|---|---|---|
| United States--a (1973, 1979) | 4.1 (2.4--b) | 3.9 (2.8--b) |
| FRG--a (1965, 1977) | 5.1 | 5.1 |
| Netherlands (1960, 1981) | 5 | 8 |
| Sweden (1960, 1978) | 13 | 23 |
| United Kingdom (1960, 1981) | 14 | 20 |

a--percent time lost
b--percent of workers unexcused absent not due to illness
SOURCE: U.S. Bureau of Labor Statistics, News Release, June 26, 1981; Clarke (1983); ISSA (1981)

Table 7.

Changes in Time Use in Five Countries

| Country, Year and Group | Location | | Location | |
|---|---|---|---|---|
| | Home | Market | Home | Market |
| | Per week | | | |
| United States 1965,1975, Married Employed Men | 9.0 | 51.3 | 9.7 | 47.4 |
| Married Employed Women | 28.8 | 38.4 | 24.9 | 30.1 |
| Canada, 1971,1981 | | | | |
| Employed Men | 11.3 | 45.4 | 12.8 | 40.7 |
| Employed Women | 20.3 | 40.6 | 19.4 | 34.9 |
| | Per day | | | |
| Norway, 1971,1980 | | | | |
| Men | 2.2 | 5.4 | 2.4 | 4.7 |
| Women | 5.9 | 1.9 | 4.8 | 2.4 |
| United Kingdom, 1961, Men 1975 | 1.5 | 6.5 | 1.5 | 5.8 |
| Women | 5.2 | 2.4 | 4.5 | 2.6 |
| Japan, 1970,1980 | | | | |
| Men | 0.6 | 7.3 | 0.6 | 6.4 |
| Women | 5.4 | 3.8 | 5.3 | 3.3 |

SOURCE: Robinson (1983); Harvey (1983); Statistisk Sentralbyra (1983); Gershuny and Thomas (1982); Nakanishi (1982)

increased slightly the time spent working at home. Among adult women the opposite was true: Hours of market work rose somewhat, while hours of homework declined sharply. The same relative increase in homework as a fraction of total work among men, and decline among women, is observed for the United States, Canada and the United Kingdom as well. Only in Japan did this change in the relative burdens of home and market work not take place, though men did increase the fraction of work time performed in the home. That women did not reduce the share of home work in their total effort may be related to the unusual trend in female labor-force participation in Japan that we noted stemmed from the rapid diminution of the fraction of women working in the home on market activities.

The information in Tables 1-7 covers a variety of aspects of labor-market behavior as completely as the available sources of data allow. Many different facets of behavior interact to produce the outcomes described in these tables. Two unifying threads appear to run through all this information, however: People in developed countries are increasingly mixing market work with leisure or nonmarket work; and the burden of market work has increasingly become spread more evenly across the adult population.

## III. The Demand for Mixed Leisure

Let us examine a simple formal model that might enable us to explain the apparent trend toward a smoothing out over short periods of time and within households of the burden of market work. Consider a world in which there are two commodities, each produced by a combination of time and purchased goods, and in which there are no taxes. Let the typical worker's utility during a year be:

$$(1)\quad U = U(Z_1, Z_2);\ U'_i > 0,\ U''_i < 0.$$

We assume that household production of the $Z_i$ is characterized by:

(2) $Z_i = g_i(X_i, t_i)$, $i=1,2$,

where the $X_i$ are the inputs of purchased goods into the production of $Z_i$, and the $t_i$ are inputs of time. The total time available to the worker is $T=t_1+t_2+t_w$, where $t_w$ is time spent on market work.

Thus far this is nothing more than the standard model of household production of Becker (1971). The novelty is in the assumption about the goods constraint. We assume that the worker's earnings depend on hours worked, $t_w$, and the wage rate w, which is a decreasing function of time devoted to the commodity $Z_2$. The money budget constraint facing the worker is thus:

(3) $\Sigma p_i X_i = t_w w(t_2) + I$,

where the $p_i$ are the prices of the goods used in producing the $Z_i$, and I is unearned income.

In this model consumption of commodity 2 reduces the hourly wage rate. Commodity 2 may be viewed as on-the-job leisure (what Schrank (1978) refers to as schmoosing); as days off spent in recreation; as home work of someone who does not specialize in home work, or as any commodity that requires that goods be combined with time off from market work on a frequent basis. I call a commodity like this a mixed commodity. That time devoted to producing such commodities reduces the market wage rate ($dw/dt_2<0$) seems reasonable; it may be that $w=w(t_2)$ is also characterized by $w''<0$, though that need not be true for our results to follow.

Utility (1) is maximized subject to the household production functions (2), the goods constraint (3) and the time constraint. The conditions for a maximum can be written as:

(4a) $$\{U_1 - \lambda[p_1 \partial X_1/\partial Z_1 + w\partial t_1/\partial Z_1]\}Z_1 = 0 \ ;$$

(4b) $$\{U_2 - \lambda[p_2 \partial X_2/\partial Z_2 + w\partial t_2/\partial Z_2 - t_w \, dw/dt_2]\} Z_2 = 0 \ .$$

where $\lambda$ is the value in utility terms of a one-unit increase in the full income of the worker. If the worker produces both of the commodities, equations (4) reduce to:

$$(5) \qquad U_2/U_1 = \frac{p_2 \partial X_2/\partial Z_2 + w\partial t_2/\partial Z_2 - t_w \, dw/dt_2}{p_1 \partial X_1/\partial Z_1 + w\partial t_1/\partial Z_1} \; .$$

Equation (5) differs from the standard conditions for a maximum by its inclusion of the expanded price of commodity 2. In addition to the price of goods purchased and the direct price of time devoted to its production, increased consumption of this commodity also reduces the wage rate received from market work, and thus the value of the worker's time in its other uses. The full price of a mixed commodity is greater than that of an otherwise identical standard commodity because of the effects of its production on the value of time.

Consider the effect of an increase in unearned income on consumption of the two commodities. Assuming neither is inferior, a rise in unearned income will by (4) make the worker more likely to consume both commodities. More interesting predictions can be made if the worker is already consuming at least some of both commodities. If leisure is a superior good, so that $t_w$ decreases as I increases, the full price of $Z_2$ relative to that of an otherwise identical commodity (same marginal time and goods intensity, and same goods price) will decrease. Under these assumptions the right side of (5) reduces to one plus the term $t_w dw/dt_2$ divided by the price of commodity 1. Unless w" and $dw/dt_2$ are large in absolute value, our conclusion follows. In this case workers will increase their relative consumption of the mixed commodity.

The effect of an exogenous increase in the wage rate, essentially a vertical shift in the function $w=w(t_2)$, depends on slope of the uncompensated supply curve of labor. If, as time-series evidence suggests, income dominate substitution effects, the fall in $t_w$ will lead, following the argument above,

to a relative increase in consumption of the mixed commodity compared to otherwise identical commodities. If the dominance of the income effect is not too great, the rise in earnings will also lead to an absolute increase in the amount of the mixed commodity that is consumed. If substitution effects dominate, so that $t_w$ increases at each value of $t_2$, the relative demand for $Z_2$ will fall; but the absolute amount will probably rise as workers' full incomes are higher. In sum, a growing consumption of mixed leisure is the natural concomitant of an increase in total consumption of leisure: Both will occur *if* income dominate substitution effects.

This discussion explains the phenomena presented in Section II as the result of income effects overcoming the extra cost of consuming the mixed commodity. With higher unearned income, or with income effects that dominate substitution effects on leisure, the fall in the wage rate that is induced by increased consumption of the mixed commodity becomes less of a deterrent. This leads to an increase in its relative consumption; but so long as it is desired, workers will consume more of it, other things equal, when there is an exogenous increase in their full incomes. Essentially, the (costly) ability to mix leisure or home work with market work provides another margin along which the effects of higher income operate.

The formal model abstracted from the existence of differential taxation of earnings and mixed leisure. Obviously, to the extent the former is increasingly taxed, while the latter is not, the incentive to consume mixed leisure is increased. The oft-noted rise in marginal tax rates in most developed countries in the postwar period may thus explain part of the phenomena under discussion, particularly in the context of a one-person household (see Woodbury, 1983). Thus it may, in addition to the role of income effects, be partly responsible for the growth of part-time work, absences and vacation time.

The phenomena are best understood in the context of the entire

household's decisions about allocating time. As we have seen, the representative worker, about whom the explanation was explicitly built, now spends fewer hours in the market and consumes more mixed leisure. The household has also used its increased full income to purchase more mixed leisure for men, who previously consumed relatively little mixed leisure. The only difficulty comes in applying this explanation to changes in time use by women. Clearly, $t_w$ has increased for them; whether their relative consumption of mixed leisure has fallen or not cannot be determined from available data. It is likely, though, that their absolute consumption of this commodity has increased along with that by men, so that both sexes are mixing leisure and market work more than they did earlier in this century. Changing rates of taxation do little to explain changes in the division of market and home production between the sexes within a household. Here the changed incentives produced by the effect of a rise in full income in the presence of a fixed endowment of time for each household member that we have stressed seems to be the best explanation of this part of the record.

This explanation of the broad range of facts describing the use of time can be trivialized by equating it to a demand for variety. It is true that higher income will lead to the consumption of more different commodities, as corner solutions become less likely.[4] However, our theory implies something more than this, namely that an increase in the consumption of leisure that is occasioned by higher income will be accompanied by an increase in the mixing of leisure with work. This could not be predicted by a demand for variety; and only our formulation could predict a relative increase in the mixing of leisure and work that accompanies a reduction in the fraction of time devoted to work.

At first glance our argument may seem like the obverse of Rosen's (1983) demonstration that increased utilization of human capital leads to an increase in specialization. The arguments are formally somewhat similar, in that

relative reductions in time spent working are accompanied in our model by relative increases in the amount of mixing of work and leisure. However, they deal with entirely different sets of issues. Rosen's argument centers on a choice about optimal investment and thus is explicitly intertemporal; the argument here deals with optimal consumption and is basically static.

## IV. Direct Tests of the Hypothesis

It is quite difficult to go much beyond the broad patterns suggested in Section II by the aggregate data. Most of the interesting hypotheses suggested by the notion of mixed leisure are better tested on micro data. Therefore this Section presents one, fairly weak test of the hypothesis using aggregate data, then outlines several tests that could be performed on micro data. It is worth noting first, though, that the common finding (e.g. Oaxaca, 1973) that part-time workers receive lower hourly wages than do otherwise identical (same work experience and formal education) full-time workers is consistent with the assumption underlying our model that $dw/dt_2 < 0$.

A formal, though still weak test of the assumption that mixing reduces the real wage rate can be conducted by examining the effects of the increased convergence of participation rates of men and women over some period of time, such as that presented in Table 1. The extent of convergence can be measured as the change in:

$$(6)\quad DEV = |LFPR_M - LFPR| + |LFPR_F - LFPR| \quad ,$$

where LFPR is the participation rate measured as a fraction, and the subscripts M and F refer to the two sexes. In situations where participation rates are converging, $\Delta DEV$ will be more negative in those countries where convergence is more rapid.[5]

Increased convergence, which is one manifestation of an increased consumption of mixed leisure, will reduce real wage rates ($dw/dt_2 < 0$). We

should thus expect a positive correlation between ΔDEV and the growth rate of real wages.[6] Unfortunately, good measures of that growth rate are not available for many countries; we rely instead on the growth rate of per-capita real income, ΔGNP, between 1960 and 1981. Since other factors, particularly the rate of capital-deepening, affect this growth rate, we hold ΔENERGY, the rate of growth of energy consumption per capita, constant in order to isolate the effect of increased mixing on growth rates.[7] Also included is the change in the aggregate participation rate, ΔLFPR, under the assumption that more workers in a given population will produce a higher real GNP per capita. All growth rates are measured as fractions.

The equation to be estimated is:

$$(7)\quad \Delta GNP = a_0 + a_1 \Delta DEV + a_2 \Delta ENERGY + a_3 \Delta LFPR.$$

Table 8 presents the estimates of (7) for the fifteen countries for which participation data are shown in Table 1, then for smaller samples.[8] (Spain is deleted because it could not be clearly classified as a developed economy at the start of the period; Austria is deleted because the participation data begin with 1968, much later than the rest of the sample.) Not surprisingly, the control variable for capital-deepening has a positive impact on the growth rate of per-capita real GNP, as does the growth of the aggregate participation rate. What is interesting for our purposes is that in those countries in which ΔDEV is more negative, reflecting greater convergence in participation rates, the growth rate of real GNP is slower. This is true for the entire sample and for the two restricted samples for which results are presented.[9] The results may partly reflect a change in the average amount of human capital embodied in the labor force, as the relative importance of inexperienced female workers in the labor force increases. We cannot distinguish that possibility from the mixing hypothesis, which is why these results provide

Table 8

Estimates of Effects on Real Growth Rates, 1960-81[a]

| | 15 Countries | Excl. Spain | Excl. Austria and Spain |
|---|---|---|---|
| Constant | .033 | .037 | .037 |
| | (5.67) | (5.67) | (5.15) |
| ΔDEV | .045 | .076 | .076 |
| | (2.78) | (3.09) | (2.87) |
| ΔENERGY | .352 | .300 | .300 |
| | (3.63) | (2.91) | (2.72) |
| ΔLFPR | .045 | .074 | .074 |
| | (1.02) | (1.53) | (1.44) |
| $\bar{R}^2$ | .64 | .67 | .65 |

[a]t-statistics in parentheses.

only weak evidence that increased mixing does come at the cost of a reduction in the real wage.

Better tests of specific implications of the hypothesis require the use of time-budget surveys that also contain information on such economic characteristics as wage rates and other income of household members. Fruitful approaches to using such data would seem to lie in the direction of distinguishing among otherwise identical workers those for whom the extra cost of mixed leisure, $dw/dt_2$, is lower than average. Thus, for example, one would expect that self-employed workers have better information on the effect of mixed leisure on their wage rate than do employees' supervisors for whom monitoring is costly; the self-employed would be able to consume mixed leisure in such a way as to produce a smaller reduction in hourly wages than could employees with the same amount of human capital. We should therefore find self-employed workers interspersing leisure with work more than otherwise similar employees. Similarly, employees whose wage per hour at work depends solely on their own effort will consume more mixed leisure, since they presumably are better able to reduce its effects on their wages than are other workers. This implies that otherwise identical piece-rated workers will mix leisure more than will workers who receive an hourly wage. To test these hypotheses one might compare absentee patterns or study time use at the workplace.

## V. Implications for the Labor Market

In this Section we examine the implications of the existence and increased importance of the demand for mixed leisure for various aspects of labor-market behavior. The first of these is the effect on the compensating wage differential that firms must pay otherwise identical workers to induce them to take jobs involving rigid work scheduling.[10] As we have seen, increases in full income lead workers to demand more mixed leisure. One

consequence is that the supply of workers to jobs that offer rigid schedules is reduced. Assuming that technology does not reduce the marginal cost of making schedules less rigid by as much as workers' trade-offs tilt against such schedules, the compensating differential offered by the market rises.

Substantial evidence on a variety of wage differentials (see Hamermesh-Rees, 1984) shows that workers with higher full incomes use part of those incomes to avoid disamenities. The compensating differentials that exist for those disamenities thus serve to equalize in part the distribution of earnings. Our theory predicts that the increased demand for mixed leisure will lead to an increase in the compensating differential necessary to attract workers to jobs on which it is difficult to consume mixed leisure. This will occur whether the growth of mixed leisure is induced by workers' increased willingness to trade off mixed leisure for earnings as their full income increases or the consumption of mixed leisure is induced by increased marginal tax rates on market work. If this happens, it will lead to a reduction in earnings inequality below what would otherwise occur, as those workers located in rigid jobs increasingly come from the lower tail of the distribution of full incomes. Insofar as most income inequality stems from inequality of earnings, this change implies that income inequality too will be reduced by the growth of demand for mixed leisure.

A second consideration is the effect of the growth of mixed leisure on the loss in utility associated with unemployment. Unemployment can be viewed, as in Ashenfelter (1980), as a constraint on labor supply (in our model, as a constraint on time devoted to household production). In particular, workers are constrained to devote more time to household production than they otherwise would, $t_w < t_w^*$, where $t_w^*$ is the amount of pure work chosen at an unconstrained maximum. The constraint on hours of work relaxes the time constraint facing the household and tightens the income constraint. Households shift production to relatively more time-intensive commodities.[11]

The existence of mixed leisure provides another margin along which the constrained household can adjust when $t_w$ is forced below $t_w^*$. Because the constraint increases the relative scarcity of income, workers will substitute against mixed leisure in order to increase their hourly wage rate. Thus a labor-supply constraint will decrease the relative consumption of the mixed commodity compared to otherwise identical commodities. The ability to substitute in this way reduces the utility loss imposed by the constraint. As with other adjustments, such as other household members entering the labor force in response to enforced reductions in hours worked by one household member, decreases in the relative production of mixed leisure are a way households can ease the burden of unemployment. The scope for such reductions depends on the length of spells of unemployment and on the ease of changing the amount of mixed leisure that is consumed per time period. If spells are of sufficient length to allow some scope for this phenomenon, the increase in the consumption of mixed leisure in the past 30 years suggests an additional reason why the burden of a given insufficiency of aggregate demand has decreased.

## VI. Conclusions

There is a broad trend in developed economies toward the consumption of what we have called mixed leisure. This commodity includes any leisure or home production that is interspersed--during a day, a week or a year--with market work. Whether this trend will continue will depend on whether the underlying incentives that have brought it about continue. These incentives include the effect of increased full income acting upon the tastes of people for whom income effects on leisure demand dominate substitution effects, and on changes in the relative rates of taxation of market work, mixed leisure and home production. Even without the trends in these incentives, though, the amount of mixed leisure consumed can change as technology changes. Especially if

workers' freedom to schedule their hours of work increases, so that the wage loss attendant on consuming mixed leisure declines, we should see still more evidence of this phenomenon.

To the extent that the growth of mixed leisure has resulted from higher full incomes, the loss of market production implied should not be deplored. Rather, through household utility maximization families have chosen to trade off production in the market for the consumption of leisure that is mixed with market work. Even if the growth of mixed leisure stems from changing tax/transfer incentives (higher marginal tax rates on earnings and the nontaxation of mixed leisure), it is not clear that welfare is worsened. To the extent that the transfers financed by the taxes (broader sick pay, for example) reflect the social expression of households' demands for mixed leisure, the net effect of the combined tax/transfer policy on welfare may be positive. Only if the changing difference in relative tax rates on market work and mixed leisure is used to finance expenditures other than those that increase the demand for mixed leisure may we conclude that the induced substitution of mixed leisure for market production represents a reduction in welfare. The issue here is exactly analogous to the discussion of the relative importance of higher incomes and incentives in Social Security schemes in reducing market work among older persons. As Martin Janssen shows in this volume, it is by no means clear from the empirical work that Social Security has had a major effect.

Obviously what has been offered here is merely a unifying way of looking at what otherwise seems to be a jumble of diverse phenomena in labor markets. The notion that increasing full incomes, or changing tax rates, will lead households to mix market work and leisure, or market and home work, does explain the facts, and it has interesting implications for such other aspects of labor-market behavior as earnings inequality and the utility loss that results from unemployment. Whether the theory proposed is valid can really

only be tested on microeconomic data. We have offered several possible tests of the theory; others, such as that presented by Heinz König in his comment, can be developed. With sufficient testing on micro data the validity of the hypothesis may be tested. The relative importance of changes in full incomes and changing tax incentives in stimulating the growth of the demand for mixed leisure can be determined too.

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## NOTES

1. Even the data on Japan are somewhat misleading, as they show total participation, including those employed in work for the market performed at home. When only work outside the home is included, the participation rate of Japanese women is also seen to have risen.

2. In some of the countries for which the data are presented the comparisons are between business-cycle peaks, implying that this is not merely a cyclical phenomenon.

3. The comparability of the data for the U.S. to those for other countries is questionable, as the U.S. data, unlike the others, are based on the monthly CPS.

4. See Jackson (1984) for some very clear evidence on this.

5. If participation rates are diverging over time in some countries and converging in others, $\Delta$DEV will be a bad measure of convergence. In only one of the 15 countries shown in Table 1 do they not converge, so this is not a problem here.

6. Clearly there is some simultaneity here, as we have shown that higher real wages will increase convergence if income effects on the demand for leisure dominate substitution effects. If we had data on unearned income across countries over time we could treat the simultaneity issue properly. Absent that, we assume that our one-equation model is identified by another equation that includes changes in unearned income as an exogenous variable.

7. Berndt-Wood (1979), among others, have shown that energy and capital are p-complements in production; thus the growth of energy use per capita is a proxy for the growth of the capital-labor ratio.

8. The energy and GNP data are from World Bank, World Development Report, 1983.

9. These results do not reflect outliers; rank correlations of $\Delta$DEV and $\Delta$GNP are also significantly positive in each of the three samples.

10. Empirical evidence of such a differential is provided by Lucas (1977) and Duncan-Stafford (1980).

11. See Grossman (1973) for evidence on this phenomenon from the United States.