ADVERTISING AND HOURS OF WORK IN U.S. MANUFACTURING, 1919-75

by

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Number 178

WARWICK ECONOMIC RESEARCH PAPERS

DEPARTMENT OF ECONOMICS

UNIVERSITY OF WARWICK
COVENTRY

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September 1980

This paper is circulated for discussion purposes only and its contents should be considered preliminary.

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1. Introduction

Over this century, the average level of weekly hours worked by the labour force as a whole has shown a fairly consistent decline. For example, from 1900 to 1979 weekly hours for the whole labour force fell from 53.2 to 39.6.[1/] However, closer examination shows that this decline is largely due to changes in the composition of the labour force, in particular, to increases in the ratio of female to male workers, and in the ratio of white-collar to blue-collar workers. Upon examining a group which has remained relatively homogenous through time, such as production workers in manufacturing, one finds a different pattern. Since 1945, weekly hours for this group have scarcely changed; in a period of steadily rising real wages it is the failure to decline that must be explained. We attempt to provide such an explanation in this paper.

Of course a slow-down in the rate of decline of weekly hours is not necessarily surprising. In terms of the strict neoclassical approach to the income-leisure choice of the individual, a reduction in hours worked can always be described as the result of a strong income effect, while the failure of leisure to increase can be described as indicating a strong substitution effect. However, theory does not warn us to expect a relatively strong income effect from, say, 1900 until 1930, and a relatively

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1/ See G.H. Moore and J.N. Hedges (1971) p.5.

strong substitution effect from then on. Various authors have expressed surprise that workers have become disinclined to seek extra leisure (that is, on the apparent rising importance of the substitution effect), during a period of rapidly rising real income.

Various explanations for this phenomenon have been put forward. Two approaches are associated with J.D. Owen (see Owen, J.D. 1969 and 1975). The earlier incorporates the price of leisure goods into the income-leisure trade-off, while the more recent examines the effect on hours of work of an unanticipated increase in the cost of raising children.

Within the framework of the optimal allocation of time Becker suggests (Becker 1965, p. 517) that 'hours worked declined secularly primarily because time-intensive commodities have been luxuries'. Presumably one would have to argue that the nature of time-intensive goods changed fundamentally to account for the failure of hours worked to decline after 1945.

Diagrammatically we can summarise these points in Figure 1.

The individual is initially in equilibrium at point E_0, on indifference curve I_0. Some exogenous force (the explicandum of this paper) now alters the relative marginal utilities raising that of income relative to leisure. This tilts the preference map anti-clockwise, so that indifference curve I_0 becomes I_0', tilting through E_0. E_0 of course is no longer optimal, and with the wage rate given, the individual adjusts by working more hours so that the marginal utility of income falls and that of leisure rises. E_1 is the new equilibrium position on indifference curve I'_1 .

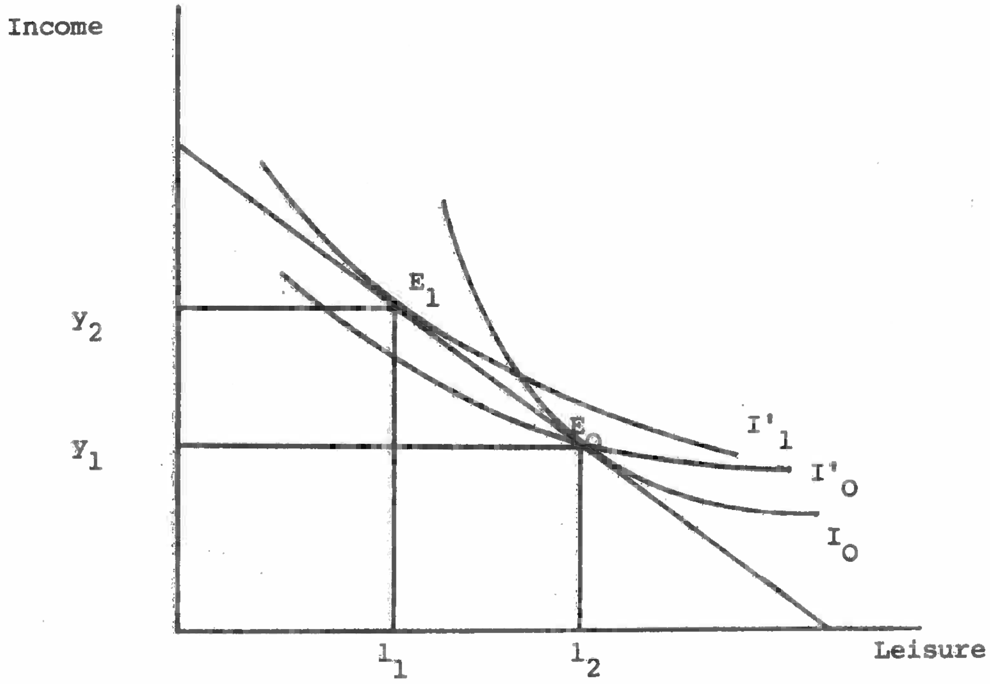

Figure 1

2. The Role of Advertising

As a very general statement it may be said that economists typically have not attached any great significance to the effects of advertising on the aggregate economy. The debate, insofar as there has been one, has focussed on the relationship between advertising and consumer demand, and hence, in aggregate, between total advertising and the consumption function. A view commonly expressed [2/] is that advertising

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2/ R.M. Solow (1968).

signals tend to cancel each other out. An advertising campaign can be successful only at the expense of another product, which implies that advertising has no influence on the aggregate economy. We believe that this is a mistaken view, and incline to the argument stated succinctly by Galbraith, 1967, p. 209-210, and found in a few other sources 3/

> "For along with bringing demand under substantial control, (advertising) provides, in the aggregate, a relentless propaganda on behalf of goods in general. . . . Being not pressed by the need for these things, (consumers) would have spent less reliably of their income and worked less reliably to get more. (our emphasis) . . . Advertising and its related arts thus help develop the kind of man the goals of the industrial system require - one that reliably spends his income and works reliably (our emphasis) because he is always in need of more."

It is noteworthy that two studies 4/ have found a significant relation between advertising and total consumer expenditure. Although in both cases the authors are rather cautious, they do report that advertising has increased the average propensity to consume. In any event, one's impression is that the profession has not by any means absorbed these results into its collection of stylised facts.

What exactly is the process by which advertising might influence aggregate consumption? Clearly if advertising is to have any influence at all it must alter the consumer's subjective measure of the utility he derives from advertised goods, relative to the utility he derives from non-advertised goods. Rather as in figure 1, the preference map tilts as the utility from the advertised goods increases and the consumer

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3/ Other sources for this idea are K.W. Rothschild, 1942, S. de Grazia, 1962, and P.A. Baran and P.M. Sweezy, 1966.

4/ D. Peel, 1975 and L.D. Taylor and D. Weiserbs, 1972. See also J.L. Simon, 1970 especially p. 199.

responds (with given budget line) by raising his consumption of advertised goods and lowering that of non-advertised goods.

Suppose now all (present) private goods are advertised. In this case non-advertised goods are composed of future goods, and publicly provided goods. We may imagine various constraints preventing the consumption of publicly provided goods from decreasing as fast as the consumer would wish. He must therefore adjust by consuming fewer future goods (that is, by saving less).

But we know that most consumers have very little (liquid) wealth.[5/] For them, the average propensity to consume is (virtually) unity. Thus the only method of adjustment left involves moving the budget constraint in a north-easterly direction. There are three methods of doing this, with real wage given . One, an increase in the debt-income ratio; two, an increase in the labour-force activity of secondary workers in the family; and three, working longer hours (at given real wage), or in a dynamic setting, keeping hours higher than they would otherwise have been (failing to let hours fall). This latter effect is the focus of this paper, and is illustrated in figure 2.

The growth in the real wage over time, shown by a wage line steepening from AB to AD, generates (by assumption) a backward bending supply of hours schedule as extra leisure is consumed. Schedule E_0E_1 is traced out. However if, as real income grows, advertising expenditure

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5/ See, for example, J.S. Duesenberry (1949) p.39. Even as late as 1970, according to G. Katona et.al., 1971, 42% of families were in the $0-$500 range of liquid assets.

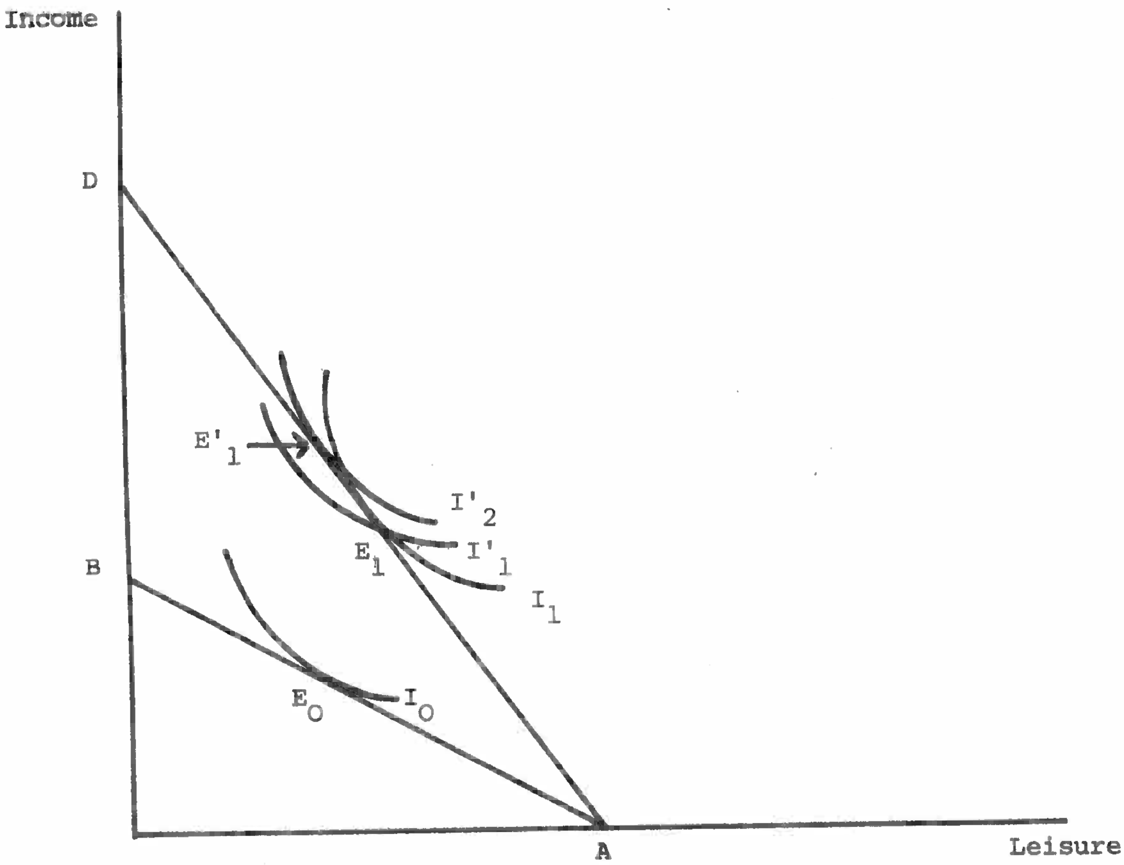

Figure 2

increases, then the preference map will tilt, and the new equilibrium will not be E_1 but E_1' ; the decline in hours has been arrested.

The hypothesis to be considered in this paper, therefore is that as the real wage rises workers will tend to work fewer hours; but that this fall in hours worked is opposed by advertising, which exerts a positive influence on hours worked.

3. Modelling the Relationship between Hours of Work and Advertising

(a) The hours of work series

Details of the series used in this study are given in the Appendix. However, the choice of the hours worked series contains some substantive issues. Briefly, two approaches exist; the BLS collects a series of hours worked per person per week from payroll data. Employers are requested to include as working normally those workers who have permission to be absent (e.g. through paid holidays). Thus this series is often described as an hours paid for (HPF) series rather than hours actually worked (HAW). From census data, on the other hand, the BLS constructs an HAW series. Unfortunately this series is shorter, and more aggregative, than the many HPF series which the BLS publishes. However, Ethel B. Jones, 1963, published an HAW series for manufacturing workers up to 1957. Clearly one can experiment with extrapolation to bring this series up to data.

Which series should one use? It has been argued, by Jones among many others, that an HAW series provides a more accurate picture of leisure preferences than does an HPF series. Since <u>paid</u> holidays allow leisure to be substituted for <u>work</u> rather than income it must be true that estimates of welfare are affected by the hours series chosen. But income in the narrow sense is not affected; and while income per hour actually worked is clearly influenced by an extra paid holiday, it is not obvious how this statistic may be used. It is clearly <u>not</u> the price of leisure, which we take to be measured by the income lost through taking an extra hour off work. A \$5 per hour, \$200 per week worker who gets a paid holiday is still a \$200 a week worker for whom the price of leisure is \$5 (\$200 ÷ 40) not \$6.25 (\$200 ÷ 32).

Now the traditional aim of research into hours of work has been to determine the slope of the supply curve of labour, in other words to examine the worker's willingness to trade-off income for leisure as his real wage rises. Of the two hours series, the HAW does not enable one to consider this latter point very closely. A fall in HAW can arise from two sources; one, which does interest us, arises from the decision to forego income, but the other, which may not interest us, arises from an increase in paid holidays. This latter effect implies a trade-off not between income and leisure, but between work and leisure.

It may be objected that this is a disingenuous argument; that an extra day of paid holiday must involve some sort of trade-off with income because workers could have opted for higher incomes instead. But we do not know that this is so. There may be no obvious mechanism which allows workers to make such a trade-off, particularly where extra holidays are laid down by national decree. On the other hand, the HPF series cannot, by definition, contain any element of paid holidays. Therefore a fall in HPF, as long as it is not demand induced, must arise from the worker's willingness to trade-off leisure against income, which is precisely what we wish to measure. Where the series may be wrong, however, is in its first observation, which may well differ from the level of hours actually worked for that year. But thereafter, changes in HPF (controlling for the demand side) will reflect workers income-leisure preferences. For these reasons we prefer the HPF series. However we do use the HAW series in parallel, and report the results for it also.

(b) Measuring advertising signals

Fundamentally, we see advertising as helping to create a whole life-style. The impact of aggregate advertising is therefore likely to be long-lived. Following the arguments summarised by Palda, 1964, we treat advertising as a capital good whose influence decays over time. Thus the aggregate level of (real[6/]) advertising signals in existence at

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6/ We use the CPI as a deflator since a price index for advertising is available only for a small part of our sample (in Backman, 1967).

a point in time is given by $K_t = (1 - \delta)K_{t-1} + A_t$ where δ is the annual decay rate and A_t real expenditure on advertising. Our expectation is that this definition of advertising will have greater explanatory power than current advertising alone. The precise decay rate must of course be an empirical question, and is found by an R^2-maximising search procedure.

We are of course unable to identify that portion of advertising which is received by production workers in manufacturing; we assume that no serious problem arises from our using advertising received by the whole population. However, whether to deflate by population at all is not a simple issue, as, for example, Taylor and Weiserbs indicate.[7/] We wish to identify the quantity of advertising signals received per person per unit of time. If population grows and the advertising industry grows in step, we would assuredly prefer to deflate (real) advertising by population, in order not to pick up a pure size effect.

But in adjusting to the higher population the advertising industry may enjoy some scale economies. Consider the billboard case. A growth in the number of travellers will induce the provision of a second billboard where one existed before. But at least some of the original travellers will see the new billboard; there is a public good type of effect. Thus on average signals received per individual may rise. Furthermore, even if we focus on television advertising the growth in the number of viewers may involve an important quality effect if the larger number of

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7/ op.cit. p.647.

potential viewers merits expensive and highly persuasive commercials which would have been unprofitable with the smaller number of viewers. Again, deflating by population will lead us to understate the true increase in real signals received by each consumer.

In the last resort this issue can only be resolved empirically. We experiment with and without the population deflator and report both results.

(c) The market in hours

We are interested in tracing out the determinants of long-run movements in the supply of hours;but cyclical fluctuations may obscure this trend and must be controlled for. We argue that over the long period changes in hours of work are supply determined - the income-leisure decision of workers is paramount. Cyclically, however, when the demand for labour is low, workers may be unable to find buyers for all the hours they would like to supply at the going real wage. Conversely when demand is high workers may be induced to supply more than their long-run quantity of hours.

At least one author[8/] has attempted to treat the market for hours of work as a simultaneous system. Our view is that this is unnecessarily complex, a view borne out to some extent by the poor results which Owen finds for the demand side of his equation. His approach is based on marginal productivity theory; if the capital stock, the degree of technical progress and the number of employees are all specified, then there will be (on the usual assumptions of marginal productivity analysis) an

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8/ Owen, J.T. (1969).

inverse relationship between the wage and hours per worker demanded. The problem with this analysis, of course, is that the former magnitudes can scarcely be taken as given if hours are changing through some external force. The inverse relationship between the wage and hours of work, sought (but not found) by Owen, will be elusive indeed if the employer is able to optimise across any or all of these variables. Thus an exogenous reduction in hours may lead, not to an increase in the wage (the effect which Owen postulates) but, say, to an increase in the level of employment. Thus it is no great surprise that Owen finds an insignificant relationship between the wage and hours of work. As an approximation, then, we portray the demand-for-hours schedule as perfectly inelastic with respect to the real wage.

For these reasons, we envisage the market for hours as in figure 3. We expect a backward-sloping supply of hours schedule, and a

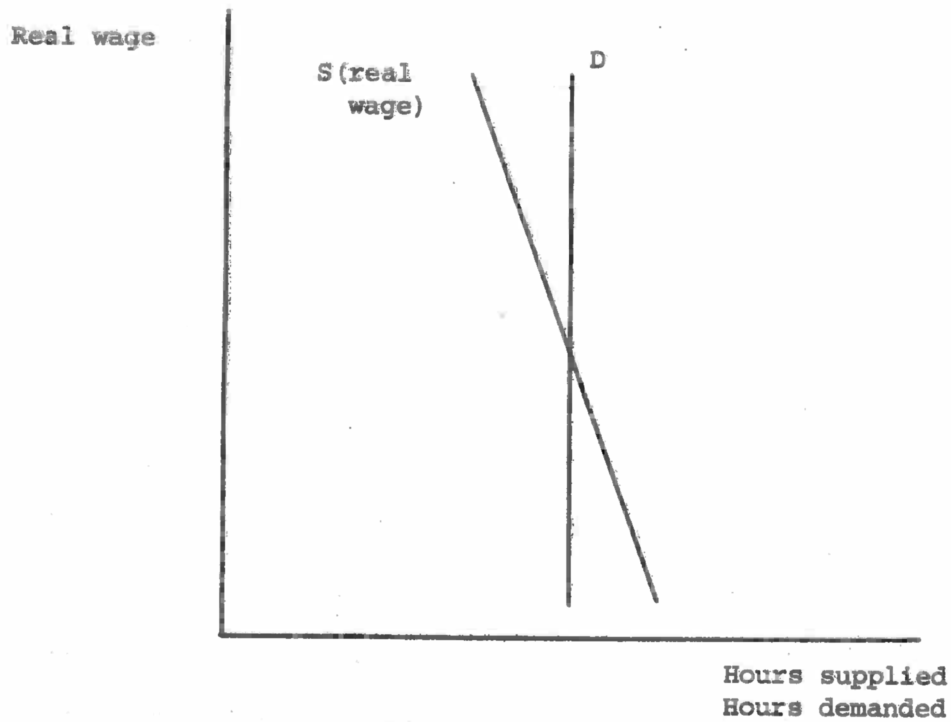

Figure 3

vertical demand schedule. But the demand schedule will be displaced by changes in economic activity. Optimising behaviour both by workers and by employers is likely to lead to a positive relationship over the cycle between aggregate demand and hours of work. But once the demand schedule shifts, particularly in a leftward direction, disequilibrium is likely to persist in this market, (although not necessarily in the market for manhours).

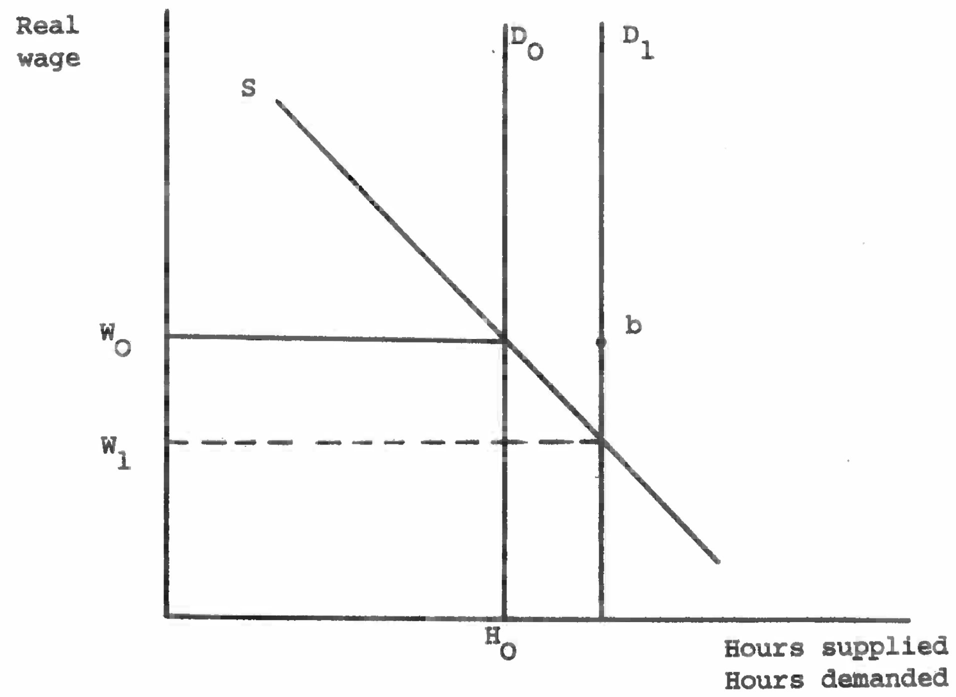

Figure 4

The market begins in equilibrium at W_0 and H_0 in Figure 4. An increase in economic activity causes the demand schedule to shift to D_1. Needless to say, the new long-run equilibrium real wage, W_1, will be difficult to realise. In our study we use the real wage exclusive of overtime premia in order to focus on long-run effects. Thus any increase in overtime premia will be ignored. Position b may be reached by the use of overtime premia and other payments, as well as via the appeals to patriotism used in periods of war. However, if unemployment is very low, employers may throw more weight on hours as the adjustment variable, and in consequence hours may not fully adjust.

Reductions in aggregate demand are more complicated. There seem to be two cases. Consider first the case of a temporary decline in aggregate demand. Employers seem content to reduce the demand for hours rather than the demand for men.[9/] In such a case, we have the result in figure 5.

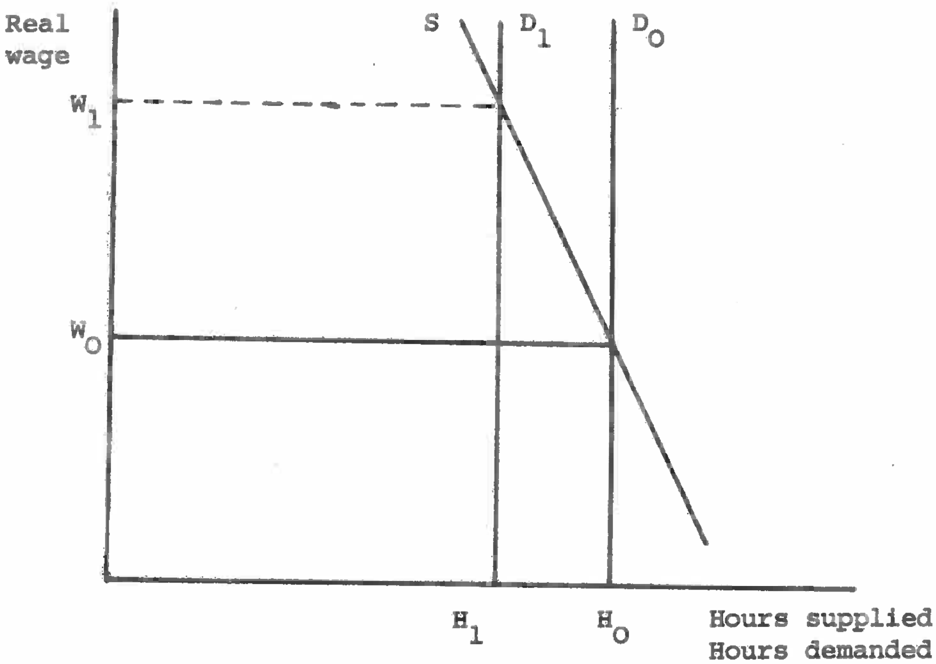

Figure 5

9/ Arguments supporting this proposition, based upon hiring and firing costs, are suggested by many authors, e.g. Oi (1962), Ehrenberg (1971).

Hours fall from H_0 to H_1 at real wage W_0. The new long-run equilibrium wage is W_1, but clearly, given the fall in economic activity, there are no forces at work to equilibrate the market. The market remains in disequilibrium, with workers unable to find buyers at the current real wage for all the hours they wish to sell.

When a major recession occurs, with the fall in aggregate demand seemingly permanent, employers will be much more inclined to adjust by reducing men rather than hours.[10/] In an extreme case, the demand-for-hours schedule will not shift leftward at all. But this type of scenario, combining high unemployment with relatively long hours, will lead to demands from a variety of sources (union leaders, some politicians, and of course, the unemployed) for a reduction in hours in order to alleviate the hardship of unemployment.[11/] Labour may indicate its willingness to shift the supply-of-hours schedule to the left - culminating, for example, in the NRA codes in the U.S. in 1933.[12/] Thus we have a situation as depicted in figure 6.

W_0H_0 is the initial equilibrium. The fall in demand is believed to be long-lasting, so that the demand for hours remains at D_0. But the high rates of unemployment induce labour to press for shorter weekly hours, culminating in a kinked supply schedule like S_0S_1. The demand for hours now exceeds its supply at the current real wage.[13/] The consequent

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10/ As the recession deepens employers have more incentive to adjust downwards the number of employees; presumably in a generally depressed economy the probability of losing forever the fixed investment in such workers is small.

11/ Millis and Montgomery (1938) p. 476. This is a marvellous source of information on the behaviour of wages and hours during the 1930's.

12/ *ibid*. p. 476-485.

13/ By setting wage minima and other wage provisions, the NRA codes caused money wages to rise. But these codes per se are said to have had little independent impact on real earnings. See Millis and Montgomery, op.cit. p.122-123 footnote 4, and J.M. Clark, 1934, esp. pp.18-19.

disequilibrium is resolved in two ways; one, employers substitute men for hours, so that equilibrium in the <u>hours</u> market is achieved by a gradual leftward shift in the demand-for-hours schedule;[14/] two, employers attempt to change the law, at least in the 1930's.[15/]

In summary, we are modelling a market which we believe to be boradly supply dominated, but which has spells of major disequilibria. We do not believe that simultaneous estimation is appropriate. Our strategy is therefore to use a single-equation estimating procedure, relyin on demand indicators to identify the nature of the disequilibrium, and choosing variables to capture these effects. As our measure of aggregate demand, we have kept clear of strict labour market measures, since they are likely to be in part dependent upon the hours outcome; for example, the rate of unemployment may be influenced by the hours decision. We choose as our measure of aggregate demand the sum of the exogenous (real) expenditures in the economy - investment plus net exports plus government spending, and then define as our demand variable the deviations from its trend.

In addition we experiment with dummy variables for certain periods within our sample. DUM30 refers to the period 1930-40 and DUM40 to the period 1941-45, each being an intercept dummy. DD30 and DD40 are the corresponding slope dummies, allowing the response of hours to the demand variable to change. Despite many experiments, it appears that DUM30 and

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14/ Unemployment in the US fell, of course, after 1933, and continued falling until 1938.

15/ <u>Schechter Poultry Corp. v. U.S.</u> 295 US 495, May 27th 1935. See Millis and Montgomery <u>op.cit</u>. p.370 footnote 2.

DD30 do best when defined from 1930-40. In this context, see Millis and Montgomery op.cit. p. 476-477, who argue that 'the work-sharing movement apparently attained most momentum between 1930 and 1932. In March of the latter year . . . 63% of the workers in manufacturing were employed part-time'.

Our basic estimating equation is therefore

$$H_t = f(W_t, K_t, D_t, \text{DUM30}, \text{DD30}, \text{DUM40}, \text{DD40})$$

where H_t is average weekly hours per production worker in manufacturing (the HPF series), W_t is the real wage for this group defined to exclude overtime premia,[16/] K_t is real advertising defined as a capital good with annual decay rate δ, D_t is the measure of aggregate demand, and the dummy variables are as above.[16/]

4. Empirical Results

Table 1 contains a variety of regression results. In each case the method of estimation is OLS, and the sample contains annual observations from 1919-75. Specifying the hours, the real wage, and the advertising variable in logarithmic form produces better results than the linear version, in that although the R^2 is similar, the DW statistic in the former is substantially better.[17/]

16/ Note that from 1919-40 we use the real wage inclusive of overtime as a proxy for the real wage excluding overtime. See Appendix for data sources

17/ The R^2-maximising linear version gives an R^2 of 0.920 but a DW statistic of 1.6241, which is in the inconclusive range. The equation reads $H_t = 47.05 - 24.34W_t + 6.13D_t + 1.83K_t - 1.48\text{DUM30} + 0.81\text{DUM40}$. Only the coefficient on DUM40 is not significant at the 95% level. The decay rate on K is 0.70.

Equation A.1 is a pure supply side formulation, and indicates serious serial correlation. By comparing equation A.2 with equation A.1 one sees the effect of introducing our demand variable D_t. The comparison of equation A.3 with equation A.2 shows that $\log K_t$ is a better specification of the advertising variable than is $\log A_t$, with improvements both in R^2 and the DW statistic. Equations A.4 through A.7 show experiments with dummy variables. The intercept dummies, DUM30 and DUM40 seem superior to DD30 and DD40, the slope dummies; in terms of $\bar{R}^2$, equation A.6 and A.7 are equally good; we prefer A.7 on the basis of its DW statistic.

The overall impression which these results generate is one of great robustness. Most of the coefficients remain highly stable across different formulations of the estimating equation. Our prior expectations of the signs of these coefficients are vindicated. The results indicate a backward-sloping supply schedule of labour hours against the real wage, with an elasticity of approximately -0.2 [18/]. The exogenous expenditure variable have a persistantly significant effect on hours of work. We note that when dummy variables are introduced (separately) for the 1930s and for the period 1941-45, the explanatory power of the model improves. Both slope and intercept dummies improve the fit; the latter is slightly superior to the former specification.

The negative coefficient on the 1930s dummy is regarded as substantiating the argument put forward on p.13 and 14. Workers responded

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18/ This coefficient approximates to those found by A.C. Harberger (1964) and J.D. Owen (1971).

Table 1

Eqn. No.	Dependent Variable	Constant	$\log W_t$	D_t	$\log K_t$	δ	$\log A_t$	DD30	DD40	DUM30	DUM40	DW	R^2	$\bar{R}^2$
A.1	$\log H_t$	3.4753 (71.89)	-0.1987 (-5.27)				0.1119 (4.16)					0.41†	0.348	0.324
A.2	$\log H_t$	3.4554 (181.74)	-0.2164 (-14.59)	0.01796 (17.24)			0.1203 (11.37)					1.32†	0.901	0.896
A.3	$\log H_t$	3.4499 (200.48)	-0.2229 (-16.38)	0.2044 (20.94)	0.0486 (12.91)	0.37						1.55†	0.918	0.914
A.4	$\log H_t$	3.4679 (188.53)	-0.2167 (-15.92)	0.1821 (11.61)	0.0343 (10.60)	0.28		0.0628 (2.36)				1.66	0.924	0.918
A.5	$\log H_t$	3.4632 (184.29)	-0.2208 (-15.64)	0.1561 (5.46)	0.0381 (10.65)	0.31		0.0858 (2.29)	0.0381* (1.11)			1.75	0.926	0.918
A.6	$\log H_t$	3.4787 (183.06)	-0.2118 (-15.58)	0.1767 (11.62)	0.0313 (9.60)	0.27				-0.0313 (-2.96)		1.77	0.927	0.922
A.7	$\log H_t$	3.4702 (171.48)	-0.2166 (-15.12)	0.1663 (9.09)	0.0369 (9.47)	0.31				-0.0314 (-2.87)	0.0130* (1.06)	1.85	0.929	0.921

Notes (i) all equations estimated by OLS, with annual observations, 1919-75.

(ii) t-statistics are in parentheses

(iii) *denotes not significant at 95% level

(iv) † indicates DW $\nmid$ Du at 5% level.

to the massive unemployment of those years by reducing the number of hours they were willing to supply at the going real wage. Thus the observed number of hours worked was lower than would have been predicted without the dummy variable. The coefficient on DUM40 is positive, as predicted on p.12, but is not significant at the 95% level.

Our main attention must focus on the performance of the advertising variable. The t-statistic never falls below 9 in the fully specified models; the capital good formulation out-performs the current period version of the advertising variable; the elasticity of hours with respect to advertising is stable, usually between 0.03 and 0.04; the annual decay rate of advertising is usually around 30%. These results are hard to ignore; they strongly argue for advertising as a powerful influence upon the aggregate economy.

We now go on to consider the effects of defining certain key variables differently, and show some results in Table 2. The 'B' series of equations in Table 2 refer to the hours series labelled in the above as HAW. Equation B.2, for example, corresponds to equation A.2 in Table 1. The 'C' series refers to the advertising variable deflated by population.

The HAW series is somewhat suspect, and as such we do not place great faith in it. Although the R^2 of B.7 is higher than that of A.7 the Durbin-Watson statistic is in the indeterminate range, which creates a feeling that the series leaves something to be desired. Nonetheless one's impression is that the general picture implied by the results shown in the A series of equations is maintained, with the coefficients still highly significant. B.7 indicates that advertising has no influence outside the current period. However the DW statistic suggests that serial correlation may be present, and a Cochrane-Orcutt transformation, presented in B'.7 shows an annual decay rate not of 100% but of 86%.

The C series of equations does uniformly less well than the A

Table 2

Eqn. No.	Dependent Variable	Constant	log W_t	D_t	log K_t	δ	log A_t	DUM30	DUM40	DW	R^2	$\bar{R}^2$
B.2	$\log(HAW)_t$	3.2916 (167.63)	−0.3752 (−24.50)	0.2111 (19.63)			0.1369 (12.53)			1.20†	0.960	0.957
B.3	$\log(HAW)_t$	3.2909 (168.28)	−0.3761 (−24.62)	0.2140 (19.98)	0.1242 (12.62)	0.90				1.21†	0.960	0.958
B.7	$\log(HAW)_t$	3.2825 (116.90)	−0.3869 (−20.92)	0.1562 (8.20)	0.1398 (8.63)	1.00		−0.0285 (−2.18)	0.0411 (2.68)	1.54†	0.967	0.964
B'.7	$\log(HAW)_t$	3.2957 (114.83)	−0.3849 (−19.81)	0.1798 (9.70)	0.1128 (7.91)	0.86		−0.0300 (−2.36)	0.1636* (1.09)	1.93	0.974	0.971
C.2	$\log(HPF)_t$	4.4682 (56.92)	−0.1598 (−13.70)	0.1675 (15.04)			0.1342 (10.32)			1.28†	0.887	0.881
C.3	$\log(HPF)_t$	4.4306 (64.32)	−0.1478 (−14.68)	0.1645 (15.61)	0.1209 (11.22)	0.95				1.35†	0.900	0.883
C.7	$\log(HPF)_t$	4.6071 (38.42)	−0.1793 (−13.94)	0.1121 (5.82)	0.1580 (7.94)	1.00		−0.0169* (−1.25)	0.0560 (3.46)	1.86	0.912	0.903

Notes

(i) equation B'.7 estimated by Cochrane-Orcutt transformation; all others by OLS; annual observations, 1919–75.

(ii) t-statistics are in parentheses.

(iii) * denotes not significant at 95% level.

(iv) † indicates DW $\nmid$ du at 5% level.

(v) in equations C.2 – C.7 the advertising variable is deflated by population.

series. We take this to mean that the level of advertising, rather than of advertising per head is the better measure of advertising signals.

5. Conclusions

The empirical results strongly support the argument that hours of work are positively influenced by advertising. With real advertising rising by 400% over the sample period, the elasticity of weekly hours with respect to advertising of around 0.035 suggests that hours are 14% higher than they would otherwise have been; that is, between 5 and 6 leisure hours extra per week might have been taken. Such an effect generates repercussions throughout the economy. Since the motivating force is more consumption, the consumer goods sector is substantially bigger, and the supply of manhours substantially greater at the going real wage than would otherwise have been the case. In general the economy is more buoyant. There are also some interesting distributive implications; ceteris paribus, labour works for a lower real (hourly) wage. Moreover, the drive for higher consumption will surely have had wider effects than simply influencing weekly hours of work. The desire of secondary workers to enter the labour force, for example, is presumably also positively influenced by advertising. Thus at any real wage the supply of manhours lies yet further to the right, and the equilibrium real wage is lower as a result of advertising. The influence of advertising in these directions merits further research.

Appendix

Our data sources are as follows:

$H_t(HPF_t)$ Employment and Earnings, US 1909-78 Bulletin 1312-11 pp. 52-53. US Department of Labor, BLS, 1979, Washington D.C.

$H_t(HAW_t)$ Ethel James (1963) for 1919-57; for 1958-75, based on extrapolation.

W_t Money hourly wage excluding overtime is found in Employment and Earnings above (p. 930) for 1941-75. We assume that prior to this date the money hourly wage inclusive of overtime is a reliable proxy, for two reasons: (i) few industries had provision for overtime before 1941 (ii) even fewer were working normal hours, particularly between 1929 and 1941. The deflator is the CPI, taken from the Handbook of Labor Statistics 1978, Bulletin 2000, Table 116, US Dept of Labor, BLS, 1979, Washington D.C.

K_t Calculated as $(1 - \delta)K_{t-1} + A_t$; current advertising taken from Historical Statistics of the US, Colonial Times to 1970, series T444-446, US Department of Commerce, Bureau of the Census, Washington D.C. plus Statistical Abstract of the United States 1977 (98th edition), US Dept of Commerce, Bureau of the Census, Washington D.C.

D_t Deviations from trend of exogenous real expenditures, taken from Long-Term Economic Growth 1860-1970 Tables A1, A2, A23, A24, US Department of Commerce, Social and Economic Statistics Administration, Bureau of Economic Analysis, Washington D.C. plus Economic Report of the President 1980, Appendix B, Table B.2, CEA, Washington D.C.

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