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Economics of Wage Determination



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A Critique of a Custom in Labor Economics

Ekkehart Schlicht*

Abstract: An explanation of significant involuntary unemployment requires an understanding of why firms behave as non-utility takers (NUT's). Such an explanation, it is argued, seems to be hard to obtain in a plausible way under the customary assumption that workers maximize a utility function involving only income and effort. If, however, slightly less crude motivational assumptions are introduced, this might lead to rather straightforward understanding of NUT behavior and, consequently, of involuntary unemployment.

1. Introduction

It is customary in labor market theory to view the worker as maximizing a utility function $u(y, e)$ in income y and effort e (where both might be vectors, even random vectors) under the constraints which he faces. These constraints involve the form of the employment contract which establishes a (possibly stochastic) relationship between income and effort $y = y(e)$. The worker's action can be influenced by changing the constraint $y(\cdot)$ along with the employment contract, since the worker chooses his effort e such as to maximize $u(y(e), e)$. The firm is supposed to select - out of self-interest or under the discipline of competition - that employment contract which maximizes profit.

I shall argue in this paper that we should eradicate this custom of assuming that the worker maximizes a given utility function involving only income and effort.

If we maintain (as I shall do throughout) that the firms choose contracts which are profit-maximizing, the custom leads to unrealistic consequences. The most important of these is that involuntary unemployment can never occur. Further, psychological research indicates that the custom is at variance with many observations on human motivation. All this suggests to me that the custom gives the wrong framing for our questions and answers also in those cases where it seems to work, and even this might warrant explanation in itself.

If we drop the custom, however, in favor of more realistic behavioral assumptions, many theoretical problems with the theory of unemployment disappear, and we might hope to gain a fresh perspective for labor market problems, in general.

2. A Criticism of the Custom

2.1 The Focus of the Critique

If we start analyzing a labor market problem by assuming that the worker maximizes a utility function $u(y, e)$, this involves several factual assumptions, which all come down to the assertion that $u(y, e)$ can be assumed to remain constant for the period under analysis¹⁾: In so far as other factors influence utility, these should not vary during the period of analysis such that we can sensibly fix them under a *ceteris paribus* clause. This entails, in particular, the assumption that utility is not influenced by the processes under analysis through other channels than those explicitly mentioned, i.e. income and effort. In other words, the constraint $y(\cdot)$ is not an argument in the utility function. This excludes e.g. that the workers' utility and motivation might be significantly affected by the *way* in which they receive their income (whether as a piece-rate or time-rate, for instance), but this is excluded by the custom, and I shall argue later on that this has detrimental consequences.

In attacking the custom, I do not oppose to its use in analyzing specific narrowly defined problems which involve no change in contractual relations or other additional variables which might influence motivation. Rather it is its use in explaining the choice of labor contracts which I oppose, since these choices seem to affect motivation significantly through other channels than income.

2.2 Non-Utility-Taking

If firms behave as utility takers in hiring, they will offer contracts which leave the workers practically indifferent between employment and unemployment. This excludes the possibility of involuntary unemployment.²⁾

Involuntary unemployment requires, hence, that the firms behave as non-utility-takers in hiring new workers, or as NUTs, for short.³⁾

It has been argued that this non-utility-taking might occur for several reasons:

1. By offering higher wages, firms might restrict turnover and reduce, hence, turnover costs (Salop (1973, 1979), Schlicht (1978), Lindbeck/Snowder (1984)).
2. By offering higher wages, firms might make it possible to use the threat of dismissal as a discipline device (Shapiro/Stiglitz (1984), Stoft (1982)).

3. By offering higher wages, firms might get, through a self-selection process, better workers (Weiss (1980)).
4. By offering higher wages, firms might induce the workers to work harder through a morale effect (Akerlof (1982), Solow (1979)).

2.3. A Criticism of Non-Utility Taking under the Custom

All these, and possible other reasons, make it worthwhile for firms to behave as NUTs, but all of them seem conceptually inconsistent with the custom of assuming the workers to maximize $u(y, e)$. This has been remarked by different writers in different contexts but it seems impossible to prove this assertion in the form of a theorem since its assumptions remain unspecified. Let me indicate briefly, however, the nature of the arguments which lead me to this conclusion.⁴⁾

1. Turnover. In the turnover case, the firm can offer a contract which involves, in one way or another, that workers pay a certain sum of money to an outside agency in case they want to change the firm, and the firms might reduce their wage level such that they just get a sufficient number of applicants, given the bonding. Alternatively they might simply require the workers to create and document sufficient immobility as long as they pay more than the reservation wage. This permits them to reduce the wage until the contracts offered are utility-taking.⁵⁾

2. Discipline. In the discipline case, firms might replace the threat of dismissal by another threat (e.g. a fine payable to an outside agency) which is considered as equivalent by the workers and is conditioned on the same signal as sacking has been. This would render it unnecessary again to pay more than utility-taking wages: Wages would simply exceed the reservation wage by that amount which would compensate for the disutility of a fine, but there would be no reason for the firm to pay more, and workers would remain indifferent between accepting and rejecting the job.⁶⁾

3. Self-Selection. In the self-selection case it remains unclear why the better workers have higher reservation wages and why it is not profitable to pretend being a good worker by simply selecting a high reservation wage. Any story explaining this will involve, however, that productivity differences turn out to be observable in one way or another. This makes it possible to condition contracts on that signal, and it is in the interest of the better workers or the firm to do so.

Take e.g. the case that the better workers face a smaller chance of dismissal or better promotion prospects which makes it worthwhile for them to search longer and put their reservation wage higher than is optimal for the less productive worker (Schlicht

(1986a)). Here it seems possible to discourage the less productive individuals by conditioning fines or premia (or equivalents) on the same signals which previously led to dismissal or promotion.⁷⁾ This would permit the firms to increase the quality of the applicants without the necessity to offer wages which more than offset the disutility of the fines for the more productive workers.⁸⁾

4. Morale. If the morale case is interpreted according to the custom, it reduces to a highly implausible income effect:⁹⁾ The utility function must be such that the workers simply like to work more if they receive more income. In the original nutritional efficiency wage model (Stiglitz (1976)), this seemed a plausible hypothesis, but with regard to modern labor markets the assumption seems strange indeed: Simply by selecting workers with other income sources, like inherited wealth or working husbands, firms could economize on wages without hurting productivity.

Formally, the "income effect" interpretation is, however, clearly compatible with the custom if no signals of effort are available.

Take e.g. the utility function $u(y, e) = y - d(cy - e)^2$ which leads to optimal effort $e = cy$. If c is large enough, a rise in income will induce an increase in efficiency which is large enough to offset additional wage expenses.

If this were true, we could expect involuntary unemployment in occupations where no signal of effort is available at reasonable cost, but in other occupations where a signal of effort is available, there arise some formal problems with obtaining NUT behaviour from the income effect.

Take the simple case of one-dimensional effort and income and assume that a signal of effort e is available which permits the firm to either implement a linear wage schedule

$$(1) \quad y = a + be$$

or to fix an effort norm e_n which gives the minimum effort required.¹⁰⁾ Consider the case of a wage schedule first.

The worker maximizes

$$(2) \quad u(a + be, e)$$

with respect to effort which yields his optimal effort response

$$(3) \quad e(a, b) = \underset{e}{\operatorname{argmax}} u(a + be, e).$$

The associated first- and second-order conditions read:

$$(4) \quad u_1 b + u_2 = 0$$

$$(5) \quad \Delta := b^2 u_{11} + 2b u_{12} + u_{22} < 0$$

$$(6) \quad \frac{\delta e}{\delta a} = - \frac{1}{\Delta} (b u_{11} + u_{12})$$

$$(7) \quad \frac{\delta e}{\delta a} = - \frac{1}{\Delta} (u_1 + b e u_{11} + e u_{12})$$

The firm maximizes its profits, that is, its value added $f(e)$ minus wage payments $a + be$, by choosing a and b and taking the worker's response (3) into account. Assume that it is optimal for the firm to behave as a NUT. Then the utility-taking constraint will not be binding and (a, b) will represent an inner maximum of

$$(8) \quad f(e(a, b)) - a - b e(a, b).$$

This implies the first-order conditions

$$(9) \quad (f' - b) \frac{\delta e}{\delta a} = 1$$

$$(10) \quad (f' - b) \frac{\delta e}{\delta b} = e$$

These conditions imply

$$(11) \quad e \frac{\delta e}{\delta a} = \frac{\delta e}{\delta b}$$

which yields together with (6) and (7) the condition

$$(12) \quad u_1 = 0$$

and, together with (4), also

$$(13) \quad u_2 = 0$$

which is hardly compatible with a reasonable interpretation of the custom: In equilibrium, the highly singular case must obtain that both the marginal utility of income and of effort are zero!¹¹⁾

Alternatively, the firm might impose an effort norm e_n which gives the minimum effort required, and offer a constant wage y . Here the worker would choose¹²⁾

$$(14) \quad e(y, e_n) = \underset{e \geq e_n}{\operatorname{argmax}} u(y, e).$$

The firm maximizes

$$(15) \quad f(e(y, e_n)) - y$$

but this time with respect to y and e_n . If NUT behavior is profitable, (15) must have an inner maximum, say (y^*, e_n^*) . Starting from this position, the effort norm can be made binding without hurting utility or productivity and $(y^*, e(y^*, e_n^*))$ gives maximum profits as well. By lowering income below y^* while maintaining the effort norm $e(y^*, e_n^*)$, profits can be increased, since effort cannot be reduced below $e(y^*, e_n^*)$. This can be repeated, and income will be reduced unless a utility taking constraint becomes binding, but this rules out NUT behavior.

Akerlof (1982) avoided this result by assuming that a binding effort norm affects morale adversely, thus harms productivity and is not imposed. This implies that the effort norm enters the utility function, and in this sense the custom is violated.

A similar argument could be made with regard to our first example: Workers simply might dislike piece rates ($b > 0$ in (1)). If this aversion is sufficiently strong, this might enforce a pure time rate, and the income effect might work. (In the case of $u(y, e) = y - d(cy - e)^2$, c large, it will for example.)

But the form of the employment contract (i.e. b in the last example) must again be assumed to enter the utility function through other channels than income and effort. This violates the custom and ultimately comes down to the assertion that employment contracts are what they are because people *like* these rather than other contracts - a position which cannot be disproved easily, but seems not to be very illuminating either!

In short, NUT behaviour and involuntary unemployment might occur in models which are faithful to the custom only if effort is not observable at reasonable cost. Since

involuntary unemployment seems to exist also in occupations where effort actually is observable at rather low cost, NUT behaviour seems not to be restricted to, and is not always caused by, informational asymmetries. I doubt that we should conclude here that the custom is valid in cases where effort is unobservable or utility taking prevails, and void in other cases. I prefer to conclude that the custom is misleading altogether, and if it seems to work in some cases, this might have happened by chance.¹³⁾

3. The Theory of Motivation and Labor Economics

3.1 The Custom as an Insufficient Theory of Motivation

According to the psychologist Solomon Asch (1952: 318), utility theory "is not so much a theory of motivation as an attempt to sidestep the need for one, " and this holds true also for the theoretical custom under discussion; its strength rests in its promise to render more detailed theories of human motivation redundant.¹⁴⁾

Up to now I have tried to argue that the custom makes it very hard to develop a useful theory of NUTs and, a fortiori, of involuntary unemployment. This suggests that either the custom is unrealistic, or involuntary unemployment does not exist.

It seems to be empirically evident that workers are, as a rule, far from being indifferent between being unemployed and getting a job at the going wage rate. This implies that firms often behave as NUTs. On the other hand, the custom seems to be in conflict with experiments and theories of motivation save under rather definite circumstances.¹⁵⁾ These two things together should render, I think, heretical views more palatable, even if there seems to be no equally simplistic alternative to replace the custom. After all it might be just inappropriate to economize in labor market theory on motivational assumptions, since some steps towards realism in the assumptions might render our theories much simpler in other respects.

Since the present paper is devoted to a criticism of the custom, rather than to presenting a better alternative, I shall only offer some very brief remarks on this possibility here.¹⁶⁾

3.2 The Overjustification Paradigm and Labor Contracts

I select the "overjustification paradigm" to illustrate that economists might profitably borrow from psychology, especially in cases which contradict the economicists model of man and, hence, the custom under discussion.¹⁷⁾

The overjustification paradigm states that "extrinsic motivation destroys intrinsic motivation." Arkes/Garske (1982: 334-335) characterize these experiments as follows:

"Deci's early experiments all had similar formats. Each subject was asked to work on several three-dimensional block puzzles. The puzzles were interesting, and Deci presumed that this challenging task would have substantial intrinsic motivation. One-third of the subjects were told before they began the task that they would be paid for each puzzle they completed (expected-money group).

One-third of the subjects were told after they had worked the puzzles that they would be paid for each puzzle they had completed (unexpected-money group). One-third of the subjects were never offered money (no-money group). After the puzzle session, when the experiment was presumably over, the subjects were left alone to read magazines, work on some more puzzles, or do whatever they liked. The experimenter left the room for several minutes while another experimenter unobtrusively observed the subjects. To the extent that subjects returned to the puzzles, they were said to be intrinsically motivated. Since they would receive no money for performance during this period and since they believed their performance was not even being monitored, any work on the puzzles would seem to be the result of intrinsic motivation.

The subjects who had never been paid spent more time doing puzzles during this period than the expected-money group, and the unexpected-money group spent as much time doing puzzles during this final session as the no-money group. The attributional analysis of these results is straightforward. Subjects who expect payment attribute their performance to the cash. ("I'm doing this because I'm being paid to.") After the experimenter pays the subject and leaves the room, there is no reason to return to the puzzle, since further payment is not expected. Whatever intrinsic interest the puzzles may have possessed initially, the attribution of performance to the money decreases intrinsic interest in them. The very important point here is that extrinsic rewards may undermine intrinsic motivation.

Deci's finding is predicted by Kelley's discounting principle, mentioned earlier. This principle states that a person will discount the role of a particular cause in producing an effect if other possible causes are present. Deci's expected-money subjects have a very prominent cause to which they can attribute their behavior - the cash. Consequently, they discount the role of intrinsic motivation.

One might think that paying the unexpected-money subjects would decrease their intrinsic motivation to work on the puzzles the next time they had a chance. But they learned of the payment only after they had completed their internal attribution, and therefore the cash did not cause an external attribution. Because they had not been

working for money, these subjects returned to the puzzles as much as the no-money subjects did.”

These experiments have been conducted in various settings, and also with regard to less enjoyable activities than puzzling (Zimbardo (1969)). If applied to wage contracts, the argument makes clear why it might be profitable for the firm *not* to have various incentive payments: Since these make work less enjoyable, they might ultimately require higher wages to keep the workers working in the firm, and it might require closer quality control which might be costly. In short, piece-rates might destroy morale. Similarly, entry fees or fines might create extrinsic motivation and thereby undermine intrinsic motivation. Thus they might simply be infeasible, rendering all the arguments against efficiency wage theories, which I have discussed earlier, redundant.¹⁸⁾

I conjecture that the use of psychological arguments might be a promising direction in future research, but I certainly cannot prove it, and I see that the danger of ad-hockery is here as great as in utility theory, where the specification of the utility functions is usually made ad hoc to suit the purpose.¹⁹⁾ To avoid this, we should rely more on experiments, after all, than on pure logic and empirically doubtful “rationality assumptions”.

3.3 Labor Relations as Basically Unconstrained Equilibria

Recently it has been argued by Carmichael (1985) that the custom implies involuntary unemployment to be possible only if there are “artificial” constraints (like minimum wage laws) operative, which prevent utility taking. This assertion seems to me to be far off the point as far as actual labor relations are concerned.²⁰⁾ A minimum wage law does not preclude the firm to tighten the work norms, to use cheap tools, to charge fees for the parking lot etc.: There are so many measures which permit the firm to reduce the workers' utility to reservation utility while gaining something from this that it seems unrealistic to assume all these possibilities away. Further it is a common observation that minimum wages are usually not binding (wage drift) and that “working to the rules” is detrimental for the efficiency of many firms. All this suggests to me that both the workers and the firms have typically much latitude to change their decisions, and that only a few outside constraints are binding: Labor relations should be considered as basically unconstrained equilibria, rather than stressing outside constraints.²¹⁾

This brings us back again to the question why the firm does not use this latitude, why it in fact behaves as a NUT, and the answer to this question, given by practitioners, will usually be: These measures are not undertaken because they undermine the morale of the work force. Thus we are thrown back to the morale models of Akerlof and

Solow, and, for that matter, to the original nutritional wage model by Stiglitz, with "health" replaced by "morale".

My case for the use of psychology is to specify more closely the interrelationship between the labor contract and morale rather than leaving labor economics open-ended at a point which seems to be of the utmost importance.

Footnotes

- *) Paper prepared for the conference of the Sonderforschungsbereich 5 on "Recent Developments in Wage Determination", in Mannheim, 5th - 7th October, 1987. I wish to thank in particular Richard Blundell, Gisela Kubon-Gilke, Renate Schubert, Jon Strand, Winfried Vogt and Elmar Wolfstetter for stimulating discussion.
- 1) My discussion of the isolation principle states the issue in greater detail (Schlicht 1985a, chap 2). See also Schlicht (1984: 73-74).
- 2) I take this definition of involuntary unemployment - namely that a worker is involuntarily unemployed if similar workers get an employment contract which he strictly prefers to unemployment - from Lorne Carmichael (1985: 1213). See also George Akerlof (1984:79).
- 3) I am referring here to cases where firms fix wages above the utility taking level and know that in advance to rule out the more obvious cases where NUT behavior might result from ignorance and uncertainty.
- 4) The survey by Janet Yellen (1984) contains some of these arguments along with pertinent references. See also the recent survey of related questions by Stiglitz (1987).
- 5) See also Salop (1979: 121) for the proposal to accomplish the same by requiring entry fees.
- 6) See also Carmichael (1985) for the proposal to accomplish the same by requiring entry fees; Sherwin Rosen (1985: 1159) on multi-part pricing; and Shapiro and Stiglitz (1984:442) for a discussion of performance bonding which they see as insufficient, however. Carl Lundgren (1985) has argued that this is not quite convincing, and I have made a related observation in Schlicht (1985b).
- 7) This has been suggested already by Weiss (1980:528) who argued that these devices are not used because they affect morale adversely.
- 8) To avoid moral hazard on the side of the firms, the firms should not profit from fining. In case of money fines, these should be made payable to an outside agency, therefore.
- 9) See however, Jon Strand (1987), for an interesting discussion of this issue.
- 10) The linearity assumption is not very restrictive since (1) can always be seen as a linearization.
- 11) Note that this problem occurs also if the morale models are embedded into the custom in a slightly less mechanical and forcible way. Let $u(y, e, \lambda)$ be the utility function of a worker, defined not only on income y and effort e but also on a justice parameter λ . The perception of justice is influenced by some social norms on appropriate income \bar{y} and effort \bar{e} in relation to actual income y and actual effort e , and we may write $\lambda = \lambda(y/\bar{y}, e/\bar{e})$. For given norms \bar{y} and \bar{e} we may define $u(y, e) : U(y, e, \lambda(y/\bar{y}, e/\bar{e}))$ and the analysis remains unaltered. Condition (12) implies now

$$\frac{\delta U}{\delta y} := - \frac{\delta U}{\delta \lambda} \cdot \frac{\delta \lambda}{\delta y}$$

which says that the marginal utility of income must be just offset by the marginal disutility of increased injustice caused by a small income change.

Condition (13) similarly implies

$$\frac{\delta U}{\delta e} := - \frac{\delta U}{\delta \lambda} \cdot \frac{\delta \lambda}{\delta e}$$

with a similar interpretation which seems to be equally strange. Further, λ should assume a maximum at $y = \bar{y}$ and $e = \bar{e}$ which implies $\delta \lambda / \delta y = 0$ and $\delta \lambda / \delta e = 0$ at this point. In the long run we must have $\bar{y} = y$ and $\bar{e} = e$ since aspiration levels adapt to actual experience, and we obtain $\delta U / \delta y = 0$ and $\delta U / \delta e = 0$ just as before.

- 12) Function (14) is, of course different from formula (3), but I have used a similar notation for simplicity.
- 13) As already mentioned, Akerlof's (1982) gift exchange theory actually violates the custom in that the effort norm enters the utility function independently of income and effort. It is, however, by no means clear that Akerlof's NUT results are immune against the introduction of more refined contracts - a problem Akerlof himself has not considered. In the case of two groups (Akerlof's second example) we should choose an optimal linear wage schedule (a_i, b_i) for each of the groups $(i=1,2)$ and construct a nonlinear remuneration scheme which leads, upon linearization at the respective optima, to these linear schedules. This might not always be possible, but the reasons remain unclear along with possible remedies. Note further that Akerlof's first example really reduces to the income effect once the reservation wage is given. (Insert Akerlof's eq. (14) into (7)). In his eq. (13) Akerlof assumes, however, that the utility maximizing effort equals the effort norm. This might be true if no incentives are given ($b = 0$ in (1) above) and the workers enjoy fulfilling the effort norm, but this cannot be assumed for $b \neq 0$, and thus Akerlof's first example might be vulnerable against the introduction of more refined contracts as well.
- 14) The fact that the custom is so wide-spread does not imply that it is actually reasonable, and I would love to cite Akerlof's (1980) theory of social custom to the effect that arbitrary and inefficient customs might persist, but unfortunately his theory is very close to the custom I want to attack!
- 15) The most penetrating criticism can still be found in Asch (1952, ch. 10). For a modern survey of motivation theory, see Hal Arkes and John Garske (1982)
- 16) It is argued sometimes that criticism is illegitimate as long as no better alternative is proposed. I do not subscribe to this view. I still feel entitled to criticize astrology although I must confess that I have no better alternative to answer the questions astrology deals with. If Ronald Coase (1984:229) writes that "we should not abandon an old theory in favor of a new one merely because the old has defects but because we believe the new to be better", he seems to suggest the illegitimacy of merely destructive criticism, but later on he argues: "Most economists make the assumption that man is a rational utility maximizer. This seems to me to be both unnecessary and misleading . . ." since according to Coase, "man as he is" simply doesn't maximize anything if he behaves in one way or another. In the end, Coase himself criticizes an old theory just because it is unrealistic, but without offering a better alternative, and this is also what I want to do here.
- 17) On the "overjustification paradigm", see Arkes/Garske (1982: 335-338), Theresa Amabile (1983: 102-103).
- 18) I have discussed this in detail in the context of the Shapiro/Stiglitz theory, see Schlicht (1986b).
- 19) i.e. we come down ultimately to assert that labor contracts are chosen because people like these, rather than other contracts.
- 20) For a more detailed criticism, see Schlicht (1987).
- 21) This latitude is a basic ^{voice option} prerequisite for using the "voice option" so aptly described by Hirschman (1979). It seems so eminently important, but incompatible with the custom.

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