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On socioeconomic causes of "wait unemployment"

van de Klundert, T.C.M.J.

Publication date:
1990

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Citation for published version (APA):

van de Klundert, T. C. M. J. (1990). *On socioeconomic causes of "wait unemployment"*. (Reprint series / CentER for Economic Research; Vol. 35). Unknown Publisher.

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by
Th. van de Klundert

Reprinted from European Economic Review,
Vol. 34, No. 5, 1990

Reprint Series
no. 35

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Address: Hogeschoollaan 225, P.O. Box 90153, 5000 LE Tilburg, The Netherlands
Phone : +31 13 663050
Telex : 52426 kub nl
Telefax: +31 13 663066
E-mail : "center@htikub5.bitnet"

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REPRINT

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ON SOCIOECONOMIC CAUSES OF 'WAIT UNEMPLOYMENT'

TH. VAN DE KLUNDERT*

Tilburg University, 5000 LE Tilburg, The Netherlands

Received December 1988, final version received June 1989

This paper discusses implications of 'wait unemployment' in a two-sector model with a dual labour market. Primary sector firms pay efficiency wages; the wage rate in the secondary sector is determined by labour supply and demand. Most queueing models assume that workers for the primary sector are only recruited from the pool of unemployed. Instead, this paper explains 'wait unemployment' by assuming that people care about their relative status in society. The model is presented in general terms and a closed-form solution is obtained by specifying functional forms. The results emphasize the need for proper manpower policies to reduce structural unemployment.

1. Introduction

As observed by Dickens and Lang (1988) there is a renewed interest in the theory of the dual labour market, which may be related to the emergence of efficiency wage theories and the formal analysis of labour union behaviour. These developments have led to a theoretical foundation of the theory of segmented labour markets, which was absent in older approaches to the field. The theories mentioned can provide an explanation of wage differentials which are not caused by differences in human capital. Such wage differentials lie at the heart of the theory of the dual labour market.

In the standard representation of the model jobs are scarce and wages are high in the primary sector of the economy, which consists of the more sophisticated branches of manufacturing [see, for example, Krueger and Summers (1988)]. People who do not get a job in the primary sector can always be employed in the secondary sector by bidding down the wage rate paid in that sector. However, segmentation of the labour market may also be a cause of unemployment. The equilibrium wage rate in the secondary sector may eventually fall below the minimum wage rate set by law. The consequences of binding minimum wages and wage distribution levelling for the allocation of labour are analysed in van de Klundert (1988).

*The author is indebted to Christian Mulder for useful discussion on the subject. He is also grateful to the anonymous referees for extensive comments on an earlier draft.

There is a different approach to the unemployment problem which focusses on the reallocation process. If firms in the primary sector only hire people from the pool of unemployed it may be worthwhile for workers not to accept a job in the secondary sector and wait for a job in the primary sector. 'Wait unemployment' explained along these lines is discussed in Calvo (1979), McDonald and Solow (1985), Bulow and Summers (1986), Johnson and Layard (1986), Atkinson (1988), Burda and Sachs (1987), Burda (1988). It is sometimes referred to as 'Keynesian unemployment' [e.g. Bulow and Summers (1986)], but this term is misleading. Aggregate demand factors have nothing to do with 'wait unemployment' as such. Alternatively 'wait unemployment' is sometimes referred to as 'voluntary unemployment', because people have the freedom to accept or to reject secondary sector jobs. Such a definition is tricky [cf. Lucas (1978), Hahn (1987), Pissarides (1989)] because unemployed workers will be engaged in searching, whatever the cause of their being unemployed. Moreover, the term 'voluntary' suggests that unemployment is not a problem, which is certainly not the case in queueing models.

The present paper analyses a form of 'wait unemployment' in a dual labour market which does not hinge on the assumption that workers for the primary sector are only recruited from the pool of unemployed and not from the pool of secondary workers. Instead, we focus on the socioeconomic causes of unemployment. Following a suggestion by Blinder (1988), Kolm (1988) and Layard (1988) it is assumed that people care about their relative status in society. If unemployed derive the status of a primary sector worker by searching for a primary sector job, this can explain that under certain circumstances unemployment may be preferred to low-status jobs, which are available. Such preferences may be related to wage differentials between sectors. A two-sector model incorporating these ideas is presented in section 2. The solution of an example of the more general model is discussed in section 3. Section 4 concludes the note with some observations on the relation between 'wait unemployment' and unemployment compensation.

2. The model

Production in the primary sector depends on the level of employment (l_1) and effort (e). The effort of employees in this sector will be higher the higher the wage differential between sectors ($\omega = w_1/w_2$) and the higher the rate of unemployment (u) in the economy. Effort functions can be given a micro-economic foundation, for instance by considering partial gift exchanges as in Akerlof (1982), assuming adverse selection by employers as in Weiss (1980) or emphasizing the possibility of shirking by employees as in Shapiro and Stiglitz (1984). The intention of this paper is not to present a specific theory of efficiency wages, but to introduce sectors which parallel institutional

descriptions of the dual labor market as given in Doeringer and Piore (1971). The primary sector is characterized by high wages, responsible jobs and career opportunities, while the secondary sector has low wages, menial and dead-end jobs. Employers and employees in the primary sector are aware of their status and may exchange gifts (higher effort for higher wages) to confirm that position. At the same time relatively high wages act as a screening device in the selection of new employees and increase the cost to workers of being replaced when caught shirking. Moreover, it can be argued that there is also a positive influence of unemployment. A higher rate of unemployment lowers the relative wage rate required to elicit a fixed effort level [cf. Bulow and Summers (1986), Hahn (1987)]. The efficiency wage theory serves therefore the purpose of analysing a dual labour market.

The production opportunities, x_1 , in sector 1 can now be summarized by the following two equations:

$$x_1 = f_1(el_1), \quad f'_1 > 0, \quad f''_1 < 0, \quad (1)$$

$$e = e\left(\frac{w_1}{w_2}, u\right), \quad e_w > 0, \quad e_u > 0, \quad e_{ww} < 0. \quad (2)$$

The output of the primary sector is chosen as numeraire so its price is unity. Firms in the primary sector maximize profits by choosing l_1 and w_1 optimally. This yields as first-order conditions

$$f'_1(el_1) = \frac{w_1}{e}, \quad (3)$$

$$f'_1(el_1) = \frac{w_2}{e_w}. \quad (4)$$

Eqs. (3) and (4) can be combined to give the well-known Solow condition:

$$\frac{e_w}{e} \frac{w_1}{w_2} = 1. \quad (4a)$$

The level of effort in the secondary sector is constant and normalized to one. The production function can then be written as

$$x_2 = f_2(l_2), \quad f'_2 > 0, \quad f''_2 < 0. \quad (5)$$

Profit maximization by firms in this sector results in the traditional marginal productivity rule:

$$pf'_2(l_2) = w_2, \quad (6)$$

where p denotes the price of good 2 in terms of good 1. The economy is closed implying that relative prices are endogenous. Eq. (6) gives the demand for labour in the secondary sector. The supply of labour in this sector follows from:

$$l_2 = l^s - l_1 - ul^s. \quad (7)$$

It is assumed for simplicity that aggregate labour supply (l^s) is exogenous. In what follows we scale such that $l^s = 1$ for convenience. The wage rate in sector 2 can be found by equating labour demand and labour supply.¹

Product demand depends on consumer behaviour. With a homothetic utility function in x_1 and x_2 we may write

$$\frac{x_1}{x_2} = g(p), \quad g' > 0. \quad (8)$$

The model as it stands now contains eight equations in nine endogenous variables, viz. x_1 , x_2 , l_1 , l_2 , w_1 , w_2 , p , e and u . The missing equation relates to the behaviour of the unemployed. More specifically, there has to be a specification of the reservation wage at which unemployed workers are indifferent with regard to accepting a job in the secondary sector or remaining unemployed. Usually the missing link is related to search or waiting [e.g. McDonald and Solow (1985), Bulow and Summers (1986), Atkinson (1988), Burda (1988)]. There may be a percentage of jobs in the primary sector falling free each period of time, because people retire, die, etc. If it is assumed that firms in the primary sector only hire new employees from the pool of unemployed it may be worthwhile to reject job opportunities in the secondary sector. Whether waiting to get employed in the primary sector is an attractive alternative depends on the wage rates paid in both sectors and the level of unemployment compensation. Abstracting from intertemporal considerations the reservation wage of workers for a job in the secondary sector can easily be found [see, for instance, Burda (1988), Van de Klundert (1988)].

If the percentage of jobs which will open up in the primary sector is denoted by δ , the probability of finding a job equals $\xi = \delta l_1/u$. The reservation wage for jobs in the secondary sector will then be

¹It should be observed that in the real world the secondary labour market may not clear during downturns. However, business cycles are not taken into account here.

$$w_2 = \xi w_1 + (1 - \xi)b,$$

where b is unemployment compensation per worker plus any monetary value of leisure. Substituting for ξ gives:

$$w_2 = b + \frac{\delta l_1}{u} (w_1 - b).$$

The basic assumption of this approach that workers in sector 1 are exclusively recruited from the pool of unemployed may be questioned. As is observed by several authors [e.g. Blinder (1988), Fischer (1988)] search may not be a full-time job. Indeed search activities may go along with a full-time occupation elsewhere. Even if the costs of searching on the job are higher workers may prefer this to being unemployed. Under these circumstances the probability of finding a primary sector job is equal for the unemployed and workers in sector 2. As a result the traditional model of 'wait unemployment' breaks down. Nevertheless the preconditions for the existence of 'wait unemployment' exist as argued by Pissarides (1988). Evidence coming from the 1984 Labour Force Survey in Britain shows that in terms of overall job seekers there are more unemployed job seekers than employed ones.

However 'wait unemployment' may be explained along different lines. For instance following Blinder (1988), it may be assumed that people care about their relative status in society. In such a case workers consider a trade-off between relative status and income foregone by accepting unemployment. In the example chosen by Blinder, a steelworker may prefer unemployment to an inferior job, for instance as a hamburger flipper. A similar argument is presented by Layard (1988), who assumes that the unemployed do not want to work in the secondary sector which is exactly the reason for their being unemployed. Frank (1985) stresses the importance of norm and status effects in human relations. People care deeply about their relative status in society. Additional empirical evidence for occupational identification by workers is presented in Ashton (1986). The greatest opportunities for identification arise among the professional, administrative and managerial occupations, which provide a chance to make a career and exercise responsibilities. In the lower segments of the labour market identification is absent. Jobs such as cleaner, assembly-line worker, etc., do not lead to the development of an identification with the occupation. In general, a person's occupational identity varies with his or her previous work experience.

The trade-off can be made more explicit by assuming that the relative status is a function of the wage distribution. More generally, it may be postulated that utility of a worker depends on disposable income (y), relative status in the workforce (s), effort (e) and the work norms of the firm (e_n):

$$U = v_i(y, s)v_j(e, e_n), \quad \frac{\partial v_i}{\partial y} > 0, \quad \frac{\partial v_i}{\partial s} > 0, \quad \frac{\partial v_j}{\partial e} < 0.$$

For a separable utility function in effort elements and other components as presented above it is easy to derive an effort function of the form given in eq. (2). Following Akerlof (1982) work norms may be related to the wages paid by the firm compared with wages paid elsewhere and to the rate of unemployment. Maximization of U with respect to e gives rise to a first-order condition, which may be rewritten as an effort function for firms to deal with [see, e.g., Agell, Holmlund and Lundborg (1988)]. In our model the choice of effort only matters in sector 1 as explained above. In sector 2 work effort is set at the minimum requirement determined by the working rules ($e_{\min}$).

Relative status in the workforce, s , may depend on the ratio between the wage rate determining the actual status ($\hat{w}$) and the reference wage rate, which is equal to w_1 (the highest attainable position in our model). The sub-utility function v_i may accordingly be specified as

$$v_i = y \left(\frac{\hat{w}}{w_1} \right)^\theta, \quad \theta > 0.$$

The utility of different groups of workers can now be formulated. For a worker employed in the primary sector it is:

$$U_1 = w_1 v_j(e), \quad \text{with } e > e_{\min}.$$

A worker in the secondary sector obtains a utility of

$$U_2 = w_2 \left(\frac{w_2}{w_1} \right)^\theta \Psi,$$

where Ψ is the fixed value of the sub-utility function v_j for a given minimum effort: $\Psi = v_j(e_{\min})$. Finally, when unemployed utility is:

$$U_{un} = b.$$

Unemployed workers claim the same status as workers in the primary sector, and therefore in this situation we have $y = b$ and $\hat{w} = w_1$. For simplicity we scale such that $v_j(0) = 1$.

The consequences of having prices in utility and production functions in a general equilibrium approach have been discussed in Kolm (1988). Here we

have the more modest aim of finding an expression for the reservation wage invoking the indifference condition $U_2 = U_{un}$ which gives:

$$w_2 = \left(\frac{b}{\Psi} \right)^{1/(\theta+1)} w_1^{\theta/(\theta+1)}.$$

From this equation we get $\lim_{\theta \rightarrow 0} w_2 = b/\Psi$ as a special case of the more conventional model discussed above. In both models the reservation wage (w_2) depends positively upon unemployment compensation and the real wage rate in the primary sector. In which case the reservation wage is higher cannot be said a priori as w_2 depends on different parameters in the relevant equations. The impact of a binding minimum wage will therefore differ accordingly in both models.

Unemployment compensation could be related to an average wage index, for instance²

$$b = v w_1^\phi w_2^{1-\phi}, \quad v < 1, \quad 0 < \phi < 1.$$

Substitution of this equation in the expression for the reservation wage results in:

$$w_2 = \left(\frac{v}{\Psi} \right)^{1/(\theta+\phi)} w_1. \quad (9)$$

This completes the model. As can be checked the model is *partially recursive*. Eqs. (2), (4a) and (9) may be solved for e , u and w_1/w_2 . Next the remaining eqs. (1), (3), (5)–(8) may be applied to solve for the other variable: x_1 , x_2 , l_1 , l_2 , p , and $w_1(w_2)$. An example of the model will be presented in the next section.

3. An example

For the production functions in both sectors and the consumers' utility function a Cobb–Douglas specification is chosen. The effort function, eq. (11) below, is specified in line with Akerlof (1982). The complete model can then be written as:

$$x_1 = \varepsilon_1 (e l_1)^{\beta_1}, \quad 0 < \beta_1 < 1 \quad \begin{array}{l} \text{production function} \\ \text{primary sector} \end{array} \quad (10)$$

²In The Netherlands a law was passed in 1980 (called WAM: Wet Aanpassingsmechanismen) which ties up the minimum wage rate and social security payments with the general level of negotiated wages. However, in recent years the law has not been applied.

$$e = -a + h \left(\frac{w_1}{w_2} \right)^{\gamma_1} (u)^{\gamma_2}, \quad 0 < \gamma_1 < 1 \quad \text{effort function primary sector} \quad (11)$$

$$\varepsilon_1 \beta_1 (e l_1)^{\beta_1 - 1} = \frac{w_1}{e} \quad \text{labour demand primary sector} \quad (12)$$

$$\left(\frac{w_1}{w_2} \right)^{\gamma_1} = \frac{a}{h(1 - \gamma_1) u^{\gamma_2}} \quad \text{Solow-condition primary sector} \quad (13)$$

$$x_2 = \varepsilon_2 l_2^{\beta_2}, \quad 0 < \beta_2 < 1 \quad \text{production function secondary sector} \quad (14)$$

$$p \varepsilon_2 \beta_2 l_2^{\beta_2 - 1} = w_2 \quad \text{labour demand secondary sector} \quad (15)$$

$$l_2 = 1 - l_1 - u \quad \text{labour supply secondary sector} \quad (16)$$

$$\frac{x_1}{x_2} = \frac{\alpha}{1 - \alpha} p, \quad 0 < \alpha < 1 \quad \text{demand for goods} \quad (17)$$

$$w_2 = \left(\frac{v}{\psi} \right)^{1/(\theta + \phi)} w_1, \quad v < 1 \quad \text{reservation wage unemployed.} \quad (18)$$

The rate of unemployment now follows immediately from the equation for the reservation wage with respect to accepting work in sector 2 and the equation for the optimal wage rate set by firms in sector 1. Substituting the expression for w_1/w_2 from eq. (18) in eq. (13) results in:

$$u = \left[\frac{a v^{\gamma_1/(\theta + \phi)}}{h(1 - \gamma_1)} \right]^{1/\gamma_2}. \quad (19)$$

The mechanism behind this result can be explained as follows. For a given w_2 and u firms in the primary sector choose an optimal wage rate w_1 . This wage rate has to be consistent with the reservation wage w_2 , which depends upon the wage rate set in sector 1 through preferences and the way unemployment compensation is determined. Consistency is attained by variations in the rate of unemployment. For instance, if the wage rate in the primary sector is too high initially unemployment compensation will be too generous whereas at the same time utility of being employed in sector 2 will

be too low. Therefore, unemployment must rise to obtain an equilibrium solution.

As observed before, the model is partially recursive. Given the equilibrium unemployment rate, the wage ratio w_1/w_2 follows from eq. (13). Substitution of this solution and the value for u in the effort function (11) yields an outcome for e , the level of labour efficiency. The other variables of the model have to be found simultaneously, which can easily be done in the case of Cobb-Douglas specifications. As appears from eqs. (10) and (12) the share of labour in output equals β_1 :

$$\beta_1 \alpha_1 = l_1 w_1. \quad (20)$$

Similarly, eqs. (14) and (15) combine to

$$\beta_2 p \alpha_2 = l_2 w_2. \quad (21)$$

Dividing eq. (20) by eq. (21) and substituting for p from eq. (17) and for w_1/w_2 from eq. (18) yields:

$$\frac{l_1}{l_2} = \frac{\alpha \beta_1}{(1-\alpha) \beta_2} v^{1/(\theta + \phi)}. \quad (22)$$

If the wage rate in sector 2 is relatively high compared with that in sector 1, relatively more labour will be allocated in the primary sector. The wage ratio depends on the replacement ratio v . For a given v there is a positive relationship between l_1 and l_2 .

Substitution of the solution for u , eq. (19) in the labour supply relation (16) gives a second equation in l_1 and l_2 :

$$l_1 + l_2 = 1 - \left[\frac{a v^{\gamma_1/(\theta + \phi)}}{h(1 - \gamma_1)} \right]^{1/\gamma_2}. \quad (23)$$

For a given rate of unemployment the supply of labour must be allocated between sectors. This results in a negative relationship between l_1 and l_2 . Eqs. (22) and (23) can be solved for l_1 and l_2 . The solution is illustrated in fig. 1 and indicated by point S.

An increase in the replacement ratio (v) may shift both curves as shown by

Fig. 1

the broken lines in fig. 1. A higher replacement ratio leads to an increase in the reservation wage and therefore in the ratio w_2/w_1 . This stimulates the allocation of labour in the primary sector at the expense of employment in the secondary sector. The rise in the reservation wage also increases unemployment, which reduces *ceteris paribus* employment in both sectors. As a result, employment in the secondary sector falls, whereas employment in the primary sector may go either way. For the particular specification assumed here employment in sector 1 does not change as shown in fig. 1. The increase in 'wait unemployment' then goes entirely at the expense of employment in sector 2. However, it should be borne in mind that this is a special case. If the Cobb-Douglas specification is abandoned, there will be a change in employment in sector 1, but the outcome is ambiguous. A decrease in the coefficients θ or ϕ will have opposite effects. Unemployment declines and more workers will accept a job in the secondary sector.

Although the results are symmetric one may wonder whether the explanatory power of the model is the same in both cases. If people accept a job in the secondary sector they accept a loss in relative status. On the other hand, if workers in the secondary sector decide to give up their job they may not automatically receive a new status as candidates for primary sector jobs. The problem is of course that equilibrium models have no history. In the model there is the strong presumption that the unemployed do somehow belong to the workforce of the primary sector. Such a model may nevertheless be useful in explaining what may have happened in a number of European countries in the past decade. Negative demand or supply shocks may have put pressure on employment in primary sectors of the economy. For instance a decline in α in our model leads to a reallocation of employment from sector 1 towards sector 2. However, if at the same time the coverage ratio (the percentage of unemployed receiving insurance or follow-up assistance)

increases, because of changes in the institutional set-up or because access is made easier, 'wait unemployment' may increase for reasons given above.

4. Conclusion

In a number of studies 'wait unemployment' is explained by the probability of finding primary sector jobs. Such a probability may depend on objective factors such as retirements, deaths, etc. The key assumption of the usual analysis of 'wait unemployment' is that firms in the primary sector only recruit workers from the pool of unemployed. Workers in the secondary sector are not supposed to be eligible for a primary sector job. This assumption is considered unrealistic. As an alternative the present analysis puts emphasis on subjective factors such as status in explaining 'wait unemployment', i.e. the decision not to accept a job which is available in the secondary sector. Unemployment results because queueing for a job in the primary sector is preferred to a job in the secondary sector if the utility derived from the unemployment benefits, combined with the status of searching for a proper i.e. primary sector job, exceeds the utility derived from a secondary job. It should be noted that both theories lead to the same qualitative results. However, the socioeconomic approach chosen in this paper seems to be more promising with regard to explaining the real causes of 'wait unemployment'.

Although the analysis is cast in the form of a two-sector model with a segmented labour market the main results may have a much larger bearing. Unemployed people may have strong ties with the sectors where they used to have a job. In our view these ties cannot be fully explained by industry-specific human capital as in neoclassical theory, but are related to socioeconomic factors such as occupational identity and status in the labour market [e.g. Ashton (1986)]. Therefore, in the event that unemployment compensation is relatively high (perhaps because it depends upon the previous wage rate) unemployed persons may prefer to wait for jobs which they consider more suitable. Politicians in Europe have recognized that this may be a serious problem and have discussed different solutions. A crude way to solve the problem is to cut unemployment compensation. A more subtle way to attain the same results is to alter the conditions of being eligible for a benefit. People who refuse unfamiliar jobs may then face a reduction in the standard rate of unemployment compensation. In some cases it may be necessary to provide retraining facilities, which may be made attractive by a similar condition with regard to the level of unemployment benefit (the 'Scandinavian' model). Intensive retraining programmes would solve different problems at the same time. First, it reduces the mismatch which exists in the labour market. Second, adequate training may prevent a 'status loss' or even promote the relative status of unemployed workers. In

this sense the model developed in this paper provides a stronger case for manpower policies than does the usual queueing model of unemployment.

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