

9. Low Wages, Skills and the Utilization of Skills

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1 INTRODUCTION

Although the criterion for low wages is a rather arbitrary one and is related to the wage distribution within the country concerned, a substantial part of the labour force in many OECD countries seems to be unable to earn a reasonable income. The low wage incidence varies between one quarter of all full-time workers in the USA and Canada and 6 per cent in Finland and Sweden (Keese et al. 1998). These people have earnings that are far below the median income, which raises questions about the social desirability of such wages within a country.

Education is generally regarded as an important determinant for the labour market position of workers. People with more education tend to get better jobs and will therefore reduce their probability of low-wage employment. The major economic reason for this is that education increases productivity. Since income is related to productivity, more education will also imply better pay. Education and training are therefore regarded as important policy instruments to combat low pay employment and unemployment.

This relationship between education and wages, however, may be complicated by the functioning of the labour market. The link between education and wages implicitly assumes an equilibrium on the labour market. The human capital theory, for example, regards education as a deliberate investment in skills that was done because the returns to the investment will outweigh the costs. The costs of the investments are therefore directly related to the returns in the form of wages on the labour market. The concept of human capital represents at the same time the skills that someone possesses and their value on the labour market. Educational investments are, however, surrounded by great uncertainties. People may invest in education, but experience difficulties in finding a job that pays accordingly. Therefore,

surpluses or shortages of certain types of skilled labour may influence the wages people receive. As a consequence, education or the skills that people have, are not the only determinants of their wages. Despite a good educational background, labour market conditions may have a negative effect on payments.

Within economic theory, we can roughly distinguish two types of answers to the question why some people earn low wages. On the one hand, starting from the human capital assumption that wages reflect productivity, one could say that these people do simply not possess enough skills to enable them to earn reasonable wages. On the other hand, a malfunctioning labour market, may prevent people from getting adequate jobs. Therefore their skills are not fully utilized or their efforts are not rewarded according to their productivity. This observation makes it possible to define low wages in terms of the skills people possess. Low wages are defined as *The wage below the payment that people receive who completed a level of education that is regarded socially as a minimum qualification for a good labour market position, when their skills are utilized and paid for by their employer.*

The aim of this chapter is to analyse the definition and the incidence of low wages from the perspective of skills and skill utilization. We will analyse which factors cause school-leavers to earn less than this minimum normal wage. Three main reasons can be distinguished. First, the human capital point of view that a lack of adequate skills leads to low payment. Second, people may be unable to find jobs that require their educational level and they are crowded out to low-paid jobs at a level where their skills are underutilized. Third, even if people find adequate jobs, excess competition may put a downward pressure on wages since too many people are competing for these adequate jobs.

The focus on the relationship between skill level, skill utilization and wage level enables us to assign the actual occurrence of low wages to three causes. First, people may have low wages because their skill levels do not meet the education required for adequately participating in the labour market. Second, underutilization of the skill level of people whose educational background is sufficient may lead to low wages. Third, excess supply of people with a particular educational background may lead to low wages, even if these people have a job that makes full use of their skills.

The empirical analyses presented in this chapter are based on data about school-leavers in the Netherlands. A wage equation will be estimated in which we include not only the standard variables used in analyses on the earnings effect of underutilization (Hartog, 1999), but also some variables concerning the situation on the labour market (Smits and Willems, 1999). First, we include the difference in the level of the job and the level of a

person's educational background, indicating whether someone's skills are underutilized. Furthermore, the result of the market mechanism may be that if supply exceeds demand on a segment of the labour market, and consequently many school-leavers are unable to find jobs on the appropriate level, not only those who are underutilised, but also people with appropriate jobs earn less than in a situation of a balanced labour market. Therefore two variables have been included concerning the probability of being unemployed and the probability of finding a job below one's educational level. These probabilities indicate the tension on the labour market in a market segment, independent of the actual position of a person. The wage equation shows separately the effects of both the underutilization of a person's skills and the labour market conditions in the market segment that is relevant for this person.

2 THE WAGE EQUATION

To investigate the influence of educational attainment, utilization of skills and the actual situation on the labour market segment concerned, we will introduce a wage equation (explaining the log of the hourly wage) with – in addition to the standard control variables such as sex, race and age – three main groups of explanatory variables. First, wages depend on the educational attainment of workers. Second, the underutilization of this educational attainment may reduce the wages. Third, if workers have an educational background for which supply exceeds demand – and hence there are relatively many people with the same educational background who are unemployed or have a job below their educational level, wages may also decrease even if the workers themselves have found work on a level that fits their educational attainment.

The wage-reducing effect of underutilization has often been investigated in the literature (e.g. Alba-Ramirez, 1993; Groot, 1996; Hartog, 1985, 1999; Hartog and Jonker, 1998). Empirical results unequivocally show that people in jobs below their educational level earn less than those who found a job at their own level, but still more than people in this lower-level job with an appropriate (and therefore lower) educational background. Years of education that are not utilized therefore still yield returns, but these returns are lower than they would have been if an appropriate job had been obtained.

The neo-classical human capital theory (cf. Becker, 1962 and Mincer, 1974), however, predicts that individuals with the same personal characteristics and hence the same educational background, will earn the same wages,

irrespective of the type of job they obtain. The reason for this is that if there are only a limited number of jobs available that require this educational background, competition among these individuals will reduce wages to the wage level that can be obtained in less favourite jobs. Excess supply will therefore – according to the neo-classical theory – reduce wages both for those who underutilize their level of education and for those who have the same educational background, but were able to find a job at their own educational level. To estimate this influence on wages – which is generally ignored in empirical studies about the relationship between skills and wages – by means of a logit model, estimates of the probability of unemployment and underutilization are calculated. The predictions of these probabilities for each individual to be unemployed or underutilized are used as variables that represent the market situation. The logit model includes dummies for each combination of educational level and field of study. Altogether, 116 types of education are distinguished. The logit regressions also include regional variables, which distinguishes the twelve provinces of the Netherlands.

Variables such as age, race and sex will in general influence the labour market position, but do in our opinion not indicate different market segments. For that reason they are not included in the logit analyses explaining the probability of unemployment and the probability of underutilization.

3 DATA

The analyses presented in this chapter refer to school-leavers in the Netherlands. We used the data of the school-leavers survey of 1996. This survey provides information on about 20,000 school-leavers who left school in 1995, collected approximately 1.5 years after they finished school. The data used concern all levels of education. But university graduates are only partly covered by the survey (Economics, Business Administration and Technology and Engineering). Hardly any dropouts were included. The survey includes questions about gross wages, educational background (level and field), age, sex, ethnicity and employment status. Ethnicity is indicated by the definition of ‘ethnic minorities’ that is used by Statistics Netherlands: people from the countries named in the ‘Promotion of Balanced Employment Participation by Members of Ethnic Minority Act’ (WBEAA). The WBEAA countries include the Dutch Antilles, Morocco, Surinam and Turkey. The school-leavers also provide information about the level of the job they have and about the question of whether this job is within the field of their studies. Five levels of education can be distinguished:

- Low-level education (Lower General Secondary Education, MAVO), and Preparatory Vocational Education, VBO);
- Intermediate-level education: general education and short vocational courses (Higher General Secondary Education, HAVO, VWO), and Short Intermediate Vocational Education, KMBO);
- Intermediate-level: long vocational courses (Intermediate Vocational Education, MBO);
- Higher vocational education (HBO); and
- University education.

4 RESULTS

Table 9.1 shows the estimation results for the Dutch wage equation. The dependent variable is the (logarithm of the) gross hourly wages of the school-leavers (Ln W/hour). The first column provides the estimation results for the total group of school-leavers. Since academics are covered only partially by the survey, they have been excluded from this analysis. All parameters have the expected signs. Ethnic minorities and other non-Dutch individuals earn less than Dutch citizens. Men earn more than women, and every year of education provides 4.5% higher wages. Wages increase with age, and jobs with management tasks imply higher wages.

For our purpose, the important variables concern the effects of underutilization and overutilization, having a job related to the field of study (type of work), and the degree of excess supply of school-leavers with the educational background concerned, i.e. the unemployment and underutilization probabilities. All variables have the expected signs. In the equation in which all types of education are included, individuals whose skills are overutilized earn above average, while those whose skills are underutilized earn less. The reduction in wages resulting from underutilization exceeds the premium of overutilization. This corresponds to earlier findings by Hartog (1999). The separate equations for underutilized workers, individuals with jobs at the regular level for people with their educational background, and overutilized workers, show that the probability of unemployment and the probability of underutilization affects not only the wages of those who are actually

Table 9.1 Wage equation for school-leavers in the Netherlands, total group and by category of utilization*

	Utilization		
Total	Under	Regular	Over

Constant	2.331 (0.039)	2.629 (0.074)	2.152 (0.047)	2.548 (0.309)
Ethnic minorities	-0.029 (0.018)	-0.056 (0.033)	0.005 (0.023)	-0.209 (0.125)
Other Non-Dutch	-0.032 (0.050)	-0.083 (0.055)	-0.012 (0.036)	0.284 (0.420)
Sex	-0.028 (0.005)	-0.035 (0.010)	-0.024 (0.006)	-0.079 (0.060)
Education	0.046 (0.002)	0.024 (0.004)	0.056 (0.002)	0.037 (0.016)
Age				
17	-0.788 (0.038)	-0.847 (0.074)	-0.757 (0.044)	-
18	-0.573 (0.028)	-0.662 (0.045)	-0.577 (0.039)	-0.432 (0.224)
19	-0.491 (0.022)	-0.598 (0.034)	-0.446 (0.033)	-0.542 (0.166)
20	-0.337 (0.014)	-0.448 (0.026)	-0.285 (0.018)	-0.374 (0.133)
21	-0.244 (0.013)	-0.336 (0.025)	-0.202 (0.015)	-0.301 (0.128)
22	-0.151 (0.011)	-0.207 (0.023)	-0.129 (0.013)	-0.168 (0.122)
23	-0.083 (0.009)	-0.126 (0.018)	-0.065 (0.010)	-0.141 (0.127)
24	-0.063 (0.008)	-0.081 (0.017)	-0.050 (0.009)	-0.378 (0.117)
25	-0.044 (0.008)	-0.056 (0.018)	-0.040 (0.009)	0.106 (0.133)
Above 25	0.021 (0.001)	0.019 (0.002)	0.022 (0.001)	0.028 (0.009)
Management tasks	0.002 (0.000)	0.001 (0.001)	0.002 (0.000)	0.001 (0.002)
Type of job	-0.054 (0.006)	-0.082 (0.010)	-0.042 (0.008)	0.156 (0.066)
Overutilization	0.037 (0.019)	-	-	-
Underutilization	-0.089 (0.006)	-	-	-
P(Unemployment)	-0.214 (0.085)	-0.436 (0.169)	-0.097 (0.098)	-0.627 (0.795)
P(Underutilization)	-0.157 (0.021)	-0.041 (0.041)	-0.209 (0.026)	-0.168 (0.231)
N	12,605	3,676	8,703	226
R ²	0.502	0.474	0.484	0.374

Notes:

The dependent variable is LnW/hour.

* Excluding academics

Table 9.2 Wage equation for school-leavers in the Netherlands, total group and by level of education

	Total	Low level	Medium level: short	Medium level: long	Higher vocational	University
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Constant	2.350 (0.028)	1.960 (0.171)	4.745 (0.838)	2.991 (0.043)	3.155 (0.008)	2.996 (0.066)
Ethnic minorities	-0.035 (0.018)	-0.117 (0.178)	-0.041 (0.071)	-0.010 (0.037)	-0.043 (0.023)	-0.109 (0.063)
Other Non-Dutch	-0.034 (0.030)	0.274 (0.209)	-0.129 (0.242)	-0.101 (0.058)	-0.007 (0.037)	-0.063 (0.153)
Sex	-0.027 (0.005)	-0.133 (0.063)	-0.105 (0.031)	-0.052 (0.012)	-0.010 (0.006)	-0.003 (0.017)
Education	0.045 (0.001)	-	-	-	-	-
Age						
17	-0.796 (0.037)	-	-1.150 (0.425)	-	-	-
18	-0.580 (0.027)	0.204 (0.075)	-0.905 (0.260)	-0.712 (0.083)	-	-
19	-0.496 (0.021)	0.229 (0.086)	-0.835 (0.252)	-0.502 (0.052)	-	-
20	-0.340 (0.014)	0.221 (0.144)	-0.672 (0.251)	-0.310 (0.038)	-	-
21	-0.247 (0.012)	0.321 (0.194)	-0.660 (0.252)	-0.209 (0.037)	-0.163 (0.067)	-
22	-0.152 (0.011)	0.429 (0.327)	-0.555 (0.254)	-0.139 (0.037)	-0.110 (0.015)	-
23	-0.082 (0.009)	0.684 (0.261)	-0.488 (0.267)	-0.049 (0.038)	-0.094 (0.009)	-0.067 (0.072)
24	-0.063 (0.008)	-	-0.430 (0.292)	0.011 (0.040)	-0.075 (0.008)	-0.083 (0.029)
25	-0.042 (0.008)	-	-0.415 (0.292)	0.014 (0.048)	-0.049 (0.008)	-0.020 (0.018)
Above 25	0.022 (0.001)	-	-0.054 (0.071)	0.015 (0.005)	0.021 (0.001)	0.038 (0.004)
Management tasks	0.002 (0.000)	0.012 (0.013)	0.003 (0.001)	0.002 (0.001)	0.001 (0.000)	0.004 (0.001)
Type of job	-0.051 (0.006)	-0.019 (0.064)	-0.018 (0.035)	-0.035 (0.014)	-0.068 (0.007)	-0.016 (0.018)
Overutilization	0.035 (0.019)	0.334 (0.128)	0.029 (0.050)	0.091 (0.041)	-0.008 (0.030)	-
Underutilization	-0.089 (0.006)	-0.023 (0.072)	-0.019 (0.041)	-0.068 (0.013)	-0.108 (0.006)	-0.091 (0.015)
P(Unemployment)	-0.238 (0.084)	-0.545 (0.621)	-0.038 (0.456)	-0.472 (0.214)	-0.080 (0.096)	-0.959 (0.601)
P(Underutilization)	-0.153 (0.019)	0.082 (0.408)	-0.200 (0.126)	-0.238 (0.061)	-0.163 (0.024)	0.540 (0.126)
N	13,823	220	498	3,340	8,547	1,218
R ²	0.504	0.159	0.157	0.188	0.233	0.154

Note: The dependent variable is LnW/hour

underutilized, but also the wages of those who acquired a job at their own educational level or even higher. A larger probability of unemployment seems mainly to affect the position of both underutilized and overutilized workers. A larger probability of underutilization, however, mainly affects the workers with regular jobs and the overutilized. This confirms the hypothesis that more underutilization of workers with a particular educational background leads to increased competition for jobs that provide normal

wages. As a consequence, the wages in these regular jobs will also be pushed down to some extent.

It is important to note that the effect of a higher probability to be underutilized only represent changes in the wages of the different groups. People in jobs in which their skills are underutilized will on average always earn less than people who have jobs for which their skills are required, but a deterioration of the labour market position will affect the wages of these regular jobs more than the wages of the people who are underutilized. Borghans and Smits (1997) show that heterogeneity of the workers within a certain level can explain these modest wage effects for underutilized workers. Due to increased underutilization within the group as a whole, more people with relatively high productivity levels are pushed into these less attractive jobs, changing the composition of the group of underutilized workers. As a result, the consequences of such a change in composition may easily offset lower wages due to labour market pressures; so even a positive effect is possible.

Table 9.2 presents similar estimation results for each level of education separately. The effect of underutilization on wages is found at each level of education. Only for the school-leavers of the short courses at medium level, no significant effect is found for underutilization.

5 THE DEFINITION OF LOW WAGES

In general, the literature about low pay uses a definition of low wages which is based on people's relative position in the wage distribution (cf. the various studies presented in Bazen et al., 1998). In various studies, wages lower than 66 per cent of the median of the wage distribution are considered to be low. By focusing on the relationship between skills, skill utilization and wages, the model presented in this chapter enables us to apply a – less arbitrary – skill-related definition of low wages. Wages that are lower than *the wages expected for persons (i) who completed their vocational education, (ii) with an appropriate job, (iii) in a market without excess supply* are defined as low wages. For the Netherlands, the government considers school-leavers with at least a diploma at the medium level of education – i.e. Intermediate Vocational Education (MBO): short or long courses – as adequately educated for the labour market.

In order to determine the wage level which demarcates the low wages based on the above definition, the actual earnings have to be corrected for both the underutilization at the individual level and the general labour market imbalance for the people with the appropriate skill level in the two countries. Table 9.3 presents the means of the log wages (in Dutch guilders and dollar

cents) for school-leavers with these minimum required educational levels, both before and after correction. Since wage differentials also exist within a group of school-leavers in which we control for underutilization, the demarcation between low wages and normal wages has to be chosen in a pragmatic way. In this chapter, we take the mean of the log wages minus 1.282 times the standard deviation. After adjustment for the standard deviation, the minimum normal wage for the Netherlands equals \$5.29.

Table 9.3 The mean and standard deviation of the wages for Dutch IVE graduates (in Dutch guilders)

	Mean of ln wage	Standard deviation	Low wages
IVE without correction	2.6739	0.2982	
IVE after correction	2.7847	0.2931	2.4089 = fl.11.12 = appr.\$ 5.29

6 SKILL-RELATED CAUSES OF LOW WAGES

On the basis of this definition of low wages and the estimated wage equation, it is possible to assign the actual occurrence of low wages to three skill-related causes. First, people may have low wages because their educational background does not meet the standard educational background introduced above. Second, even if the educational background is sufficient, underutilization of these skills may lead to a low paid job. Third, even if people find a job at their own (sufficient) educational level, excess supply may have a negative effect on the labour market conditions and therefore give rise to low wages.

Table 9.4 shows that for the Dutch school-leavers, low wage incidence would reduce from 21.6 per cent to 9.5 per cent if everybody met the three criteria. The remaining 9.5 per cent represents unexplained variation in wages. Insufficient educational attainment only accounts for 4.9 percentage point of this 12.1 percentage point gap and work in a field not related to the study for 1.5 percentage points of the gap. Imbalances on the market account for 4.0 percentage point and individual underutilization for 1.7 percentage point of this gap. These results indicate that for Dutch school-leavers, having an educational level lower than Intermediate Vocational Education and

underutilization at the market level are the main causes for low wages. However, underutilization at the individual level only has a modest impact on the incidence of low wages.

Table 9.4 Predicted incidence of low wages, Netherlands and US

	Incidence %
Uncorrected	21.6
Adequate skill level & required field	16.7
& no underutilization	15.2
& balanced market	13.5
	9.5

The educational level of people remains an important determinant for wages. Table 9.5 presents low wage incidence and its components for the different educational levels. Among school-leavers with low level education – which is below the minimum required educational level – 69.5 per cent of the workers earn low wages. The table shows that both a more adequate educational background and a balanced market with an appropriate job for everyone, would reduce low wage incidence for these school-leavers substantially, by 18 percentage points and 16 percentage points, respectively. Additional training as well as labour market policies that increase the number of jobs of this skill level therefore seem to be appropriate policy instruments which can improve the labour market position of these people.

For the school-leavers with a medium level education, underutilization and excess supply in this market segment are the most important causes of low wages. As could be expected, hardly any of the school-leavers with a high-level educational background earn low wages.

Table 9.5 Predicted incidence of low wages for different educational groups

	Low level	Medium level: short	Medium level: long	Higher vocational	University
Uncorrected	69.5	33.1	8.0	0.8	0.2
Adequate skill level	51.8	22.5*	8.0	0.8	0.2

& required field	47.7	21.0	6.9	0.8	0.2
& no underutilization	45.6	16.0	5.8	0.7	0.2
& balanced market	33.1	10.6	3.8	0.6	0.2

* Formally, not all workers in this category have the required level of education as this category also includes the school-leavers of general education (HAVO, VWO) who are not considered to have the minimum (vocational) qualification for a good start in the labour market.

7 CONCLUSIONS

In this chapter, we presented an analysis of the causes of low wages that can be related to skills. The analysis of data on school-leavers in the Netherlands shows that a large probability of becoming unemployed mainly affects the wages of people who work below their own educational level. The probability of working below the educational level seems to put downward pressures on wages. This effect is mainly felt in regular jobs, which require a particular educational background of school-leavers.

The main cause for low wages is the acquired skill level. Excess supply on the labour market segments for the people with an appropriate educational background is another major cause of low wages. The underutilization at the individual level is a much less important cause of low earnings.

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