

# **SERIE RESEARCH MEMORANDA**

CAUSES OF LABOUR MARKET IMPERFECTIONS IN THE  
DUTCH CONSTRUCTION INDUSTRY

A. de Grip

Researchmemorandum 1986-15

mei 1986



VRIJE UNIVERSITEIT  
FACULTEIT DER ECONOMISCHE WETENSCHAPPEN  
A M S T E R D A M



## CAUSES OF LABOUR MARKET IMPERFECTIONS IN THE DUTCH CONSTRUCTION INDUSTRY.

## I. INTRODUCTION.

Since the end of the seventies several studies have been done to estimate the development of frictions between supply and demand on the Dutch labour market by means of so-called UV-analysis (e.g. Driehuis 1975, Kuipers & Buddenberg 1978, Heijke 1982, Van Ours 1982, Van den Berg 1982, De Koning 1982, 1984, Muysken, c.s. 1982, Den Broeder et al 1984, 1985 and De Neubourg 1985). Similar studies have been done on other countries' data (e.g. Gujarati 1972, Taylor 1972, Holden & Peel 1975 and Reid & Meltz 1979). A different approach can be found in Nickel (1982). Generally speaking labour market frictions may have two components: geographical frictions and occupational frictions.

One of the reasons for the attention various economists devote to labour market frictions is the noticeable increase of these market imperfections starting at the end of the sixties. Most of the studies mentioned above refer to the labour market at macro-economic level. Some studies also attempt to explain the development of the labour market frictions by means of a number of exogeneous proxy-variables. In a few cases these explanatory variables are more or less placed in a search-theoretical framework.

Hardly any research has been published in which labour market imperfections at industry level are explained. One of the reasons for this, probably is the difficulty to define an industry's labour market with the available statistical data. One of the few labour market friction analyses at industry level is the study of Heijke (1983) in which the development of imperfections on the Dutch building-trade labour market has been estimated for the period 1955-1981. The labour market friction as a percentage of employment in this industry appeared to be 2,5 to 3 times as high as

The autor would like to thank dr. N. van Hulst, Prof. dr. J.G. Knol, dr. J.J.M. Theeuwes and prof.dr. A.J. Vermaat for their helpful comments on an earlier draft of this paper and G.A. van Pruissen for his assistance in computerwork.



macro-economic friction {1} .

This high friction unemployment makes the building-trade labour market a interesting subject for a UV-analysis at industry-level. Moreover, compared with other industries, the construction industry shows a relatively high overlap between the industry and the relevant occupations. Possibly part of the relative high labour-market imperfection in the building-trade is a result of high registration of both unemployed workers and vacancies in this industry. This increases the reliability of a UV-analysis for this industry, compared with macro-economic UV-analysis. An analysis of the causes of labour market imperfections at industry level also has the advantage that the explanatory variables may have less a proxy-character than usually in macro-economic research. All this makes the building-trade labour market very suitable for analysing causes of labour market imperfections.

In this paper the significance of some hypotheses on possible causes of an increasing or decreasing labour market frictions, will be tested on labour market data of the Dutch building-trade for the period 1955-1981, by means of OLS-estimates. This period has been chosen on basis of the availability of annual data for most of the variables used in the analysis. In contrast with most other UV-research on causes of labour market friction, which after, Holt (1970) and Gujarati (1972), explicitly or implicitly occurs within a job-search framework, this paper defines the friction-problem within a human-capita "matching" framework, focussing primary on skill differences in the composition of labour market supply and demand.

The next section deals with the two lines of research in UV-analysis that enable us to test the significance of possible causes of labour market imperfections; in this paper labelled as the "direct" and "indirect" method. Section III describes the possible "imperfect matching" hypotheses tested in this paper. Section IV reports on the results of the OLS-estimates. The results show the imperfect matching framework enables us to explain labour

1. The same results have been obtained in an earlier study of Van Ours (1982).

market frictions to some extent. In section V a typically job-search explanatory variable - the wage-benefit ratio - will be added to our analysis. This however does not improve the estimation result obtained from the imperfect matching framework. The concluding section VI sums up the main results and policy implications of this paper.

## II. DIRECT AND INDIRECT TESTING METHOD.

Until now two different lines of research have been followed in UV-analysis, attempting to explain shifts of the UV-relation. The method most commonly used, which we will call the direct method, refers to testing UV-relation:

$$(I) \quad \ln(u) = a + b \ln(X_i) + c \ln(v) \quad (c < 0)$$

where:  $u$  = unemployment as a percentage of the labour force or working population;  $v$  = vacancies as a percentage of the labour force or working population;  $X_i$  = explanatory variables, by which shifts of the UV-relation can be explained;  $a, b, c$  = parameters.

Research following this direct method has been done by e.g. Reid & Meltz (1979) and De Neubourg (1985).

In other studies, research into the causes of labour market frictions has been split into two successive phases (Den Broeder c.s. 1984, 1985). Therefore we call this the indirect method. First, annual friction unemployment is calculated by means of a simple UV-relation or employment function, in which the actual values of  $u$  and  $v$  - or labour market supply and demand - are filled in. The second step in this indirect method refers to OLS-estimates of equations in which the calculated friction unemployment is the dependent variable. Heijke (1983) follows this procedure in his building-trade labour market study. First, he calculates the annual friction unemployment percentage by means of the CES-employment relation (Heijke, 1983 p. 7):

$$(II) \quad L = (S^{-f} + D^{-f})^{-1/f} \quad (f > 0).$$

where:  $L$  = employment;  $S$  = supply of labour ( $S=L+U$ );  $D$  = demand for labour ( $D=L+V$ );  $f$  = friction parameter.

For each year the friction percentage ( $uf$ ), where  $S=D$ , can be calculated as

follows (Den Broeder c.s. 1984, p. 10):

$$(III) \quad uf = 2^{1/\xi} - 1$$

The hypothesis on causes of labour market frictions can then be tested by means of OLS-estimates of equation:

$$(IV) \quad \ln(uf) = a + b \ln(X_i)$$

This indirect method has the advantage that an employment-relation can be used to calculate the development of friction unemployment. This employment-relation can be considered more satisfactory because it refers to a direct causal relation, which the UV-relation does not, as  $u$  and  $v$  are only related to each other through total supply and demand of labour (Holden & Peel 1975, De Koning 1982, Heijke 1983).

Moreover, calculation of the annual friction unemployment by means of the actual values of  $S$  and  $D$ , avoids the influence of stochastic disturbances in the friction parameter ( $f$ ) on the parameters estimated for the variables ( $X_i$ ) which attempt to explain the development of the labour-market imperfections. On the other hand the indirect method has the disadvantage that the extent of friction unemployment is calculated a priori by means of a not tested specification of a theoretical relation. This paper will not dwell on this method-battle. OLS-estimates will be done for both the direct and the indirect method.

### III. POSSIBLE CAUSES OF LABOUR MARKET FRICTIONS.

As Holt (1970) already set out, labour market frictions can be explained from two different viewpoints: on the one hand search behaviour of unemployed workers and employers in the labour market and on the other hand the segmentation of the labour market in submarkets. It is striking that most studies of possible causes of friction unemployment usually define the analysis in a search-theoretical framework, with an extension into the geographical dimension of job-search behaviour in a few studies (Reid & Meltz 1979, Heijke 1982, Den Broeder cs. 1984, 1985, De Neubourg 1985).

Hardly ever explanatory variables explicitly refer to a imperfect matching framework, which does not concentrate on changes in labour-market

participants' search time, but focusses on causes of skill differences in the composition of labour supply and demand.

In this study labour market friction is analysed within a human-capital (or related institutionalist theory) framework, in which labour market frictions are explained from inadequate matching of heterogeneous labour supply and demand. This does not imply that friction unemployment is merely an aggregation problem, in the sense of friction between markets. As the difference between frictions within markets and frictions between markets highly depends on the extent to which the labour market can be disaggregated, differences in the composition of labour supply and demand can also refer to frictions within the labour market segments that can statistically be identified.

In this section seven hypotheses will be presented that may explain the development of building-trade labour market frictions. All hypotheses focus on aspects of the mismatch of the skill composition of labour supply and demand.

#### 1. Skill-composition labour market demand

In the first place changes in the schooling composition on the demand-side of the labour market may cause frictions, if labour supply cannot adjust adequately or fast enough. Such an inadequate supply-response is highly probable in the case of a demand shift from unskilled labour to the skilled building crafts, as the excess of unskilled labour supply then will mismatch excess demand for skilled labour. A suitable indicator for this skill-level aspect in the composition of labour demand is the share of repair and rebuilding in total building production. The distinction between repair and rebuilding on the one hand and new building on the other hand, is relevant from a schooling point-of view, as the often large-scale new building generally requires relatively much less all-round craft workers than are needed for the usually small-scale repair and rebuilding. This gives us the following measure:

$$(V) \quad RBT = RB/TB. \quad (\text{Data: CBS.})$$

where: RB = nominal value of repair and rebuilding production; TB = nominal

value of total building production; RBT = part of value repair and rebuilding in total building production.

Necessarily we have to use these production data. Probably this value-ratio does not exactly correspond to relative demand for labour, as repair and rebuilding is generally more labour intensive than new building. However, if we suppose that during the period considered there has been a constant ratio between the labour intensities of repair/rebuilding and new building, the above measure can be considered a suitable indicator of the development of the skill-level composition of the demand for labour in the construction trade. Thereby we assume there can only be a shortage of skilled workers on the labour market.

As an increase of the above ratio implies an increase of the relative shortage of skilled craft-workers and therefore can lead to an increase of the labour market mismatch, we expect this explanatory variable to have a positive sign.

## 2. Apprenticeships

An important element of a good match between supply and demand for new entrants on the building-trade labour market is the extent to which new workers can be trained for the skilled building crafts. In the Dutch construction industry the greater part of this craft-schooling takes place in a 'dual' schooling system, the so-called "leerlingwezen". This dual apprentices system offers young workers theoretical formal class-room training as well as a considerable amount of on-the-job training in their craft. As this dual schooling system involves costs for the firms employing apprentices, the apprenticeship possibilities for new labour market entrants often decrease during an economic downturn, when firms are less in need of (skilled) workers. In that situation young workers will not be considered for vacancies in the skilled construction crafts. This implies that unemployment which originates as cyclical, will be transformed into labour market frictions, as apprenticeship trainings then will fail to match the demand for skilled craft-workers with the supply of not adequately trained youths.



The indicator we take to test this hypothesis is the number of apprentices as a percentage of total employment:

$$(VI) \quad APE = AP/E \quad (\text{Data: CBS.})$$

where: AP = number of apprentices; E = total employment.

As a fall in the number of apprentices may cause an increase of labour-market discrepancies, we expect this variable to have a negative sign.

### 3. Experience discrepancies

Undoubtedly the schooling of workers also has an experience component. Older experienced workers may be expected to be considerably more productive than unexperienced young workers. Of course this does not imply experienced workers are always more preferred than unexperienced ones. The relative attractiveness of experienced and unexperienced workers depends theoretically on the extent to which the age-wage differential covers the marginal productivity difference between both groups. The age/experience wage structure can be disturbed in two ways. On the one hand young workers' wages can be relatively too high, e.g. as a consequence of a relatively high minimum-wage level. On the other hand older workers can also be paid relatively too high wages, e.g. if their market power, trade unions or legal protections make their wages rigid at too high a level compared with wages young newcomers in the labour market earn.

As we have no information on marginal productivities, we have to use another indicator for the relative attractiveness of younger and older workers. We will use as an indicator for this hypothesis the relation between vacancies open for younger workers and the total number of vacancies:

$$(VII) \quad ED = V19/V \quad (\text{Data: CBS.})$$

where: ED = experience discrepancy; V19 = number of vacancies open for workers younger than 19 years old; V = total number of vacancies.

If a decrease of the number of vacancies for youths coincides with an increase of labour market frictions, we may conclude that the relative overpay of unexperienced youths has been a cause of this friction. In that case this explanatory variable has a negative sign. If older workers' wages

are relatively too high, we may expect a positive sign.

#### 4. Bumping-down processes

In his job-competition theory Thurow (1975) draws attention on the possibility that an excess of skilled workers will drive less-skilled workers out of employment from their present job-level domain into lower job levels or into unemployment, if relative wages are rigid. Such a process can be characterized as a "bumping-down process". Job-competition theory is often considered of special relevance to the allocation of new entrants in the labour market. However, as the construction industry can be considered a separate labour market segment, one would not expect schoolleavers with a building-craft certificate have to face competition of higher-skilled schoolleavers trained in another craft. But it is possible that within the building labour market bumping-down processes do occur.

First, experienced workers can drive schoolleavers - with or without a certificate - out of employment. This aspect has as a matter of fact already been modelled above in the variable ED. Second, qualified schoolleavers can drive out unqualified new entrants. The extent to which such a bumping-down process occurs, depends on the one hand of the relative supply of qualified schoolleavers and on the other hand of the "absorption capacity" - the entrance possibilities - of the labour market. Both elements are represented in the following indicator:

$$(VIII) \quad BD = (QTS - V19) / E \quad (\text{Data: CBS.})$$

where: BD = bumping-down indicator; QTS = schoolleavers qualified for the building-crafts.

As an increase of the number of certified schoolleavers in relation to the number of vacancies for younger workers may lead to an increase of the extent to which uncertified youths are driven out of employment in the building trades, the expected sign of this variable is a positive one.

#### 5. Secondary labour market

According to dual labour market theory the labour market consists of two different segments (e.g. Edwards, Gordon & Reich 1975). A stable primary

segment with skilled 'career' or 'craft' jobs and an unstable secondary segment with unskilled 'dead-end' jobs. Secondary labour markets are characterized by high quit rates, as labour supply on these market segments is not tied to a certain occupational domain in the way primary workers are.

(2)

Because of high labour mobility, secondary labour markets may face large labour market frictions. As craft-markets also can have a relatively high intra-industry labour mobility, secondary labour markets can best be identified by a high inter-industry mobility (Alexander, 1974), because unskilled workers employed in dead-end jobs are easily inclined to search for jobs in other industries. However, entrance and exit of labour supply in and out of an industry strongly depends on the employment possibilities in the industry. In this way an important fall in employment in the building trade can also force craft-workers to search for jobs in another industry. Therefore, a suitable measure for identifying the relative importance of secondary labour markets can only be derived, if we correct the quit-rate for mutations in the sector's employment. In Van Bergeijk & De Grip (1986) we developed such a corrected measure. This so-called "contrarious mutation percentage" can be calculated by the following equation:

$$(IX) \quad CMP = \frac{RE + FE + Q - |\Delta LS|}{2LS} \quad (\text{Data: EIB.})$$

where: CMP = Contrarious mutation percentage; RE = reentrance in building-trade; FE = first entrance in building trade; Q = quits out of building-trade; LS = labour supply in the building-trade.

As the data used refer to a period going from May in the previous year to May in the year of observation, it is advisable to average the annual data:

$$(10) \quad SAM = \{CMP(t) + CMP(t-1)\}/2$$

where: SAM = secondary labour market indicator.

Of course this SAM-indicator can only be considered as a proxy-variable for the extent to which the building-trade labour market contains secondary segments. As an increase in the importance of such secondary segments may

2. Alexander (1974) identifies secondary labour markets as market segments at which the quit rate exceeds 20% yearly.

cause more labour market frictions, the expected sign of this explanatory variable must be positive.

#### 6. Long-term unemployment

Long-term unemployment can create a "hard core" of unemployed workers, who cannot compete for jobs any longer with those unemployed for only a short period. Such a process is often caused by the fact that long-term unemployment mostly implies a gradual dequalification of previously skilled workers. This dequalification process is reinforced by so-called "negative feedback processes" in which unemployed workers get demotivated and lose their work-discipline. Moreover, the mere possibility of such a dequalification or demotivation process often implies stigmatization of the long-term unemployed, which makes it very difficult for every long-term unemployed worker to compete for a job. The existence of a "hard core" of unemployed workers can be an important cause of the persistence of labour market frictions even if the economy recovers again.

The indicator we use for this possible cause of labour market frictions is the number of workers that is unemployed for six months or longer at the end of November of the previous year as a percentage of total employment:

$$(XI) \quad ULP(-1) = \{UL/E\}(t-1) \quad (\text{Data: CBS})$$

where: UL = number of long-term unemployed (> 6 months); ULP = idem as a percentage of total employment. {4}

The one-year lag in this variable refers to both the gradual process of dequalification and demotivation and the way in which long-term unemployment may prolong labour-market frictions. As an increase of this hard core unemployment can imply higher labour market frictions in the next period, we have to expect a positive sign for this variable.

#### 7. Reschooling

The construction industry's labour market is a suitable ground for

4. It is striking that the term long-term unemployment has been inflating recently. Sometimes the term only refers to unemployment spells of more than 2 or 3 years. We however prefer to use the > 6 months criterium, which was standard up to the seventies.

testing the effectiveness of (re)schooling adult unemployed workers, a labour market instrument aimed at decreasing labour market frictions. Such a test is possible because there exists a rather direct link between this schooling-instrument and the building crafts.

For older workers reschooling is always less profitable than for youths. First, older workers will face higher opportunity-costs when they invest in their human-capital. Second, the period during which they can profit from their investment is shorter. Therefore (re)schooling of older workers will only take place if the greater part of the schooling-costs is subsidized.

In the Netherlands such a subsidized (re)schooling possibility does exist for a long time at the "Centra voor Vakopleidingen voor Volwassenen" (CVVs). Schooling for various building crafts accounts for an important part of these CVV-trainings. As a measure of the effect of this government schooling-instrument we take the number of workers that successfully completed schooling in the year of observation as a percentage of total employment:

$$(XII) \quad CVVP = CVV/E$$

(Data: Ministry of Social Affairs and Employment)

where: CVV = number of certified school-leavers CVV-building crafts; CVVP = idem, as a percentage of total employment.

If an increase of the number of reschooled workers causes a significant decrease of labour market friction, we could judge this labour market instrument effective. In that case the sign of this variable must be negative.

#### IV. RESULTS TIME-SERIES ANALYSES.

The hypotheses formulated in section II will be tested by both methods used in UV-analysis literature: the direct testing method where  $u$  is the dependent variable and the indirect method where  $u_f$  must be explained. Both variables are expressed as a percentage of total employment in construction industry, similar to the way the explanatory variables are defined.

Table 1 shows the most acceptable estimation results for the entire

period 1955-'81, for both testing procedures. It is striking that the two estimation methods differ at some points. The second equation of this table - which includes the reschooling variable CVVP - shows the most acceptable results of the indirect testing method. In the direct method adding the CVVP-variable (equation 1) does not improve the result of the third equation.

TABLE 1: ESTIMATION RESULTS 1962-1981.

	C	Ln(APE)	Ln(RBT)	Ln(BD)	Ln(ED)	Ln(CVVP)	Ln(V)	D.W.	R2
1.Ln(u)	-8.67 (-5.4)	-1.754 (-5.0)	.753 (3.6)	.583 (1.8)	.977 (2.9)	-.176 (-1.3)	-1.00 (-7.3)	1.61	.93
2.Ln(uf)	-2.42 (-2.9)	-.911 (-4.7)	.469 (3.9)	.593 (3.9)	.597 (2.7)	-.168 (-2.2)		1.63	.84
3.Ln(u)	-7.46 (-5.6)	-1.924 (-5.8)	.635 (3.3)	.797 (2.8)	.873 (2.6)		-.921 (-7.4)	1.56	.93
4.Ln(uf)	-1.63 (-2.0)	-.984 (-4.8)	.393 (3.2)	.688 (4.4)	.497 (2.2)			1.30	.81

t-values are shown in parenthesis; D.W.= Durbin-Watson statistic;  
R2=corrected multiple correlation coefficient

Although all variables in equation 1 have the right sign, the parameter of the bumping-down variable only differs from zero at a 95% confidence interval, while the reschooling variable CVVP is only significant at the 90% level.

The hypotheses explaining significant causes of shifts in labour market frictions, according to both testing methods are:

- the skill composition of labour demand, as represented by the share
- of repair and rebuilding in total building production (RBT);
- the number of apprentices (APE);
- the in relation to their relative productivity - compared with young workers - too highly paid older workers (ED).

Also the bumping-down variable appears to be significant in the most acceptable equation results of both methods (equation 2 and 3). However, in the direct testing method this variable is only significant at a 95% level, if the reschooling variable is added.

The estimation results also show that reschooling of older workers at the CVV's contributes to the elimination of labour market imperfections. Though, only in the indirect method the parameter of this variable differs significantly from zero at the confidence level of 97,5 %. In the direct method the effect of reschooling only meets the 90% level.

It must be noted that the Durbin-Watson statistic for first-order autocorrelation is not really satisfying. The D.W.-values are all in the uncertain region.

#### Secondary labour market

As the relevant data for the SAM-variable are only available since 1962, we can only test the significance of this hypothesis for the period 1962-'81. Table 2 presents the estimation results of the regressions in which this variable is added to equation 3 and 4 of table 1.

TABLE 2: ESTIMATION RESULTS 1962-1981.

	C	Ln(APE)	Ln(RBT)	Ln(BD)	Ln(ED)	Ln(SAM)	Ln(V)	D.W.	R
Ln(u)	-8.17 (-5.0)	-1.892 (-5.6)	.606 (3.4)	.360 (1.1)	.967 (2.6)	.525 (2.0)	-.990 (-7.5)	1.66	.95
Ln(uf)	-2.82 (-4.1)	-1.006 (-6.7)	.294 (3.5)	.348 (2.9)	.500 (2.8)	.222 (1.8)		2.19	.90
Ln(u)	-9.14 (-5.4)	-2.076 (-5.8)	.618 (3.1)	.443 (1.2)	1.091 (2.7)		-.947 (-6.6)	1.55	.93
Ln(uf)	-3.34 (-5.0)	-1.068 (-6.9)	.305 (3.4)	.353 (2.8)	.555 (3.0)			1.97	.89

t-values are shown in parenthesis; D.W.= Durbin-Watson statistic; R2= corrected multiple correlation coefficient

In both testing methods the SAM-variable has the expected sign. However, in both cases the coefficient differs significantly from zero at a 90% confidence level only. Moreover, in the direct method the bumping-down variable becomes insignificant. This however is mainly a result of the shortening of the testing period, as appears out of the added estimation results of the equations without the SAM-variable over the shorter period 1962-'81.

The OLS-estimates over this period show an improvement of both the

Durbin-Watson and the R2-statistic compared with the estimation results over the period 1955-1981.

Long-term unemployment

The dequalification/stigmatization hypothesis does not appear to be a significant argument for the development of labour market imperfection in the construction industry. The coefficients of the ULP-variable do have the right sign, but in no equation they differ significantly from zero (Table 3).

TABLE 3: ESTIMATION RESULTS 1955-1981.

	C	ln(LLWP)	ln(RBT)	ln(BD)	ln(ED)	ln(ULP)	ln(CVVP)	ln(V)	D.W.	R2
ln(u)	-7.06 (-5.2)	-1.623 (-3.9)	.531 (2.5)	.624 (1.9)	.859 (2.6)	.061 (1.2)		-.930 (-7.5)	1.62	.93
ln(uf)	-1.44 (-6.8)	-.857 (-4.8)	.346 (3.2)	.619 (6.3)	.491 (1.9)	.027 (.2)			1.27	.80
ln(u)	-8.16 (-4.8)	-1.543 (-3.6)	.652 (2.7)	.480 (1.4)	.949 (2.8)	.049 (.9)	-.148 (-1.1)	-.998 (-7.2)	1.61	.93
ln(uf)	-2.32 (-2.5)	-.862 (-3.4)	.447 (3.2)	.568 (3.3)	.591 (2.6)	.011 (.3)	-.162 (-2.0)		1.63	.84

t-values are shown in parenthesis; D.W.= Durbin-Watson statistic; R2= corrected multiple correlation coefficient

What we have not discussed yet, are the often remarkable differences between the coefficients in both testing methods. The always significant variables RBT, APE and ED have estimated parameter values in the direct method that are more than twice the the values in the indirect method. The same applies for the SAM-variable. For the other variables - BD and CVVP - the difference is much less. One of the reasons for these differences is the fact that in the indirec method the coefficient of V is not an estimation result, but annually calculated by filling in the actual values of S and D in equation II. This avoids the influence of stochastic disturbances in the friction parameter on the estimation results of the other variables. However, the main explanation for the differences is of course the different specification of the equations of the direct (UV-relation) and the indirect (CES-employment relation) method.



As most of the explanatory variables only claim to have a proxy-character, we cannot possibly interpret the coefficients too strictly. Therefore the main purpose of our analysis can only be determining whether the signs of the explanatory variables corresponds with the hypotheses tested. One might however wonder if the coefficients of the APE-variable in the direct method is theoretically correct, as it is considerably smaller than -1. Nevertheless, one should be careful on this point. Undoubtedly a great part of the craft training occurs within the formal apprenticeship trainings, but in the construction industry there also are several other formal trainings or jobs with considerable on-the-job training. In as much as the APE-variable is correlated with the development of these alternative trainings, it is possible that the APE-variable also represents the influences of the alternative trainings. Moreover, it should be noted that the estimated coefficients in the direct method equation show the elasticity of total unemployment in relation to the explanatory variables, while the indirect method equation shows the effect of the explanatory variables on labour market friction.

Apart from the bumping-down variable, the value of the coefficients of the significant variables is hardly sensitive for adding additional variables to the regressions. The bumping-down variable is also the only variable, which coefficient considerably changes when the testing period is shortened from 1955-'81 to 1962-'81. This too makes that we have to doubt if (this specification of) the bumping-down hypothesis offers an adequate explanation of an increase in labour market imperfections in the Dutch construction industry.

#### V. ADDITIONAL CAUSES.

It may be interesting to combine the 'traditional' job search framework with the matching framework presented above. The more so as the Durbin-Watson statistic of most of the OLS-estimates in section IV were not in the decisive range. This may indicate the existence of other causes of labour market imperfections, not represented by the explanatory variables included

in the above equations. Therefore we also tested the significance of the well-known job-search hypothesis, according to which an increase of the relative height of the average social benefits compared with average net-wages will result in a lengthening of search time of the unemployed workers. The variable we use is the so-called wage-benefit ratio (WBR):

$$(XIII) \quad WBR = w/ub$$

where:  $w$  = average net wage;  $ub$  = average net unemployment benefit

This variable must therefore have a negative sign on theoretical grounds. As an indicator we use the macro-economic data developed by Den Broeder *cs.*(1985), assuming that the development of this macro-economic wage-benefit ratio parallels the development of the wage-benefit ratio in the construction trade. These data only go back as far as 1960. Table 4 shows the best results of the OLS-estimates of equations with the additional WBR-variable.

TABLE 4: ESTIMATION RESULTS 1962-1981.

	C	Ln(APE)	Ln(RBT)	Ln(BD)	Ln(ED)	Ln(SAM)	Ln(WBR)	Ln(V)	D.W.	R2
Ln(u)	-7.77 (-3.6)	-1.826 (-4.4)	.578 (2.8)	.334 (.9)	.923 (2.3)	.534 (1.9)	-.601 (-.3)	-.967 (-6.2)	1.54	0.94
Ln(uf)	-2.22 (-3.0)	-.813 (-4.5)	.250 (3.0)	.208 (1.5)	.407 (2.3)	.257 (2.2)	-1.318 (-1.6)		1.83	0.91
Ln(u)	-8.17 (-5.0)	-1.892 (-5.6)	.606 (3.4)	.360 (1.1)	.967 (2.6)	.525 (2.0)		-.990 (-7.5)	1.66	0.95
Ln(ua)	-2.82 (-4.1)	-1.006 (-6.7)	.294 (3.5)	.348 (2.9)	.500 (2.8)	.222 (1.8)			2.19	0.90

t-values are shown in parenthesis; D.W.= Durbin-Watson statistic; R2= corrected multiple correlation coefficient

The WBR-variable has the expected sign in both the direct and indirect testing method, but it only appears significant at a 90% level in the second equation of table 4. In the direct method the variable does not have any additional explanatory value. Moreover, the addition of this job-search theory variable does not have a positive influence on the Durbin-Watson statistic either.

Possible other additional hypotheses also could be sought in yet another direction. As pointed out in section II labour market imperfections can also

be caused by geographical frictions between various regional labour markets. Especially for the construction industry there are indications of such an unequal regional dispersion of unemployment and vacancies. As data on these are only available since 1978, it is not possible to include a suitable variable representing these geographical dispersion in time-series research.

## VI. CONCLUSIONS.

In contrast with most other research on causes of labour market friction, this paper reports on research focussing on hypotheses from a human-capital - or related institutionalist theory - "matching" framework. Some of these imperfect matching hypotheses appear to be able to explain the development of labour market frictions in the Dutch construction industry to some extent in the period considered. According to both the direct and the indirect testing method, several variables representing these hypotheses can be seen as significant causes of labour market frictions in this industry. These causes are: the development of the skill-composition of labour demand (RBT), the apprenticeship possibilities (APE) and the too high relative wages of older workers (ED).

The relevance of the development of apprenticeship possibilities confirms the importance both unions and employers in construction industry attach to apprenticeship training at the moment. Within the building trade, the change in the skill composition of labour demand as a result of the increased importance of repair and rebuilding is also broadly held responsible for the existing friction unemployment. The fact that relative wages of older workers would be too high compared with youths' wages, however, is not heard publicly. As the variable used to test this hypothesis has much more a proxy-character than the two other always significant explanatory variables, we have to be careful in interpreting the significance of the experience-discrepancy variable.

Moreover there is some indication of bumping-down processes by which certified school-leavers are crowding out school-leavers without a building-trade school certificate (QTS). However, the results of this variable are

not very stable. The same can be said of the hypothesis, which states that the existence of a secondary labour market segment of unskilled workers also implies an increase of labour market frictions. Moreover, estimation results do indicate a weakly significant negative effect of the reschooling of unemployed adult workers on the level of friction unemployment in the construction industry. The long-term unemployment hypothesis does not contribute significantly to the explanation of labour-market imperfections in the construction industry in the period considered.

An important policy implication of this research undoubtedly is that it is highly important to stimulate an increase of the apprenticeship possibilities in the construction industry, as the development of the number of apprenticeships appeared to be a principal cause of labour market imperfections in the building trades. The research presented in this paper also indicates that it is recommendable to increase the skill level of the workers in the building trade. This will probably solve the skill-mismatch on the labour market caused by the transition from the often large-scale new building project to repair and rebuilding projects, which can be seen as a structural development, requiring relatively more skilled craft-workers. Furthermore, a relative decrease of the number of unskilled workers may induce a decrease of parts of the building trade labour market that can be characterized as secondary labour markets in which - usually unskilled - workers frequently face periods of unemployment.

Although the reschooling variable only appeared to have a weakly significant effect on friction unemployment in the construction industry, we may carefully conclude the reschooling of adult workers in the CVVs probably has some effect in fighting friction unemployment.

The significant positive sign of the experience discrepancies variable is also important from a policy point-of-view, as it rejects the nowadays often heard supposition that a decrease of relative youth wages will improve the functioning of the labour market. For the construction industry labour market this does not appear to hold true. However, as has been said before, the rather indirect proxy-character of the explanatory variable representing

the experience-discrepancy hypothesis makes that we have to be careful in interpretating the significance of this variable.

The above shows an imperfect matching framework offers good possibilities to explain labour market imperfections in UV- or employment relations analyses. Adding a well-known job-search theory variable, the wage-benefit ratio, did not improve the estimation results of the equations.

Andries de Grip.

### References

- Alexander, A.J. (1974), "Income, Experience and Internal Labour Markets in: Quarterly Journal of Economics, 1974, pp. 63-85.
- Berg, D.J. van den (1982), "Specification and Estimation of the Unemployment-vacancy Curve in the Period 1956-1979", in: De Economist, 1982, pp. 397-419
- Bergeijk, K. van; A. de Grip (1986), "Bestaan en ontwikkeling van interne arbeidsmarkten in Nederland", in: Sociaal Maandblad Arbeid, 1986 (forthcoming).
- Broeder, G. den; J.A.M. Heijke; J. de Koning (1984), "Friction Between Supply and Demand on the Netherlands Labour Market", series: Foundations of Empirical Economic Research, 1984/2, Netherlands Economic Institute, Division of Labour-Market Research, Rotterdam, 1984.
- Broeder, G. den; J.A.M. Heijke; J. de Koning (1985), "Een vastgelopen arbeidsmarkt; kan het ook anders?", in: Economisch Statistische Berichten 1985, pp. 772-776, 779.
- Brown, A.J. (1975), "UV Analysis", in: G.D.N. Warwich (ed), The Concept and Measurement of Involuntary Unemployment; Allen & Unwin, London, 1976, pp. 134-145.
- Driehuis, W.(1978), "Labour Market Imbalances and Structural Unemployment", in: Kyklos, 1978, pp. 638-661.
- Edwards, R.C.; M. Reich; D.M. Gordon (1975), "Labor Market Segmentation", Lexington Books, Lexington, Mass.
- Evans, G.J. (1975), "A Note on Trends in the Relationship Between Unemployment and Unfilled Vacancies", in: Economic Journal, 1975, pp. 135-139.
- Gujariti, D. (1972), "The Behaviour of Unemployment and Unfilled Vacancies: Great Britain 1958-1971", in: Economic Journal, 1972, pp. 195-204.
- Heijke, J.A.M. (1982), "Arbeidsallocatie en loonstructuur", in: J.C. van Ours; C. Molenaar; J.A.M. Heijke; De wisselwerking tussen schaarsteverhoudingen in het arbeidsbestel, WRR, V-26; Staatsuitgeverij, 's Gravenhage, 1982, pp. 207-302.
- Heijke, J.A.M. (1983), "The Performance of the Wage Mechanism in the Building Trade", series: Foundation of Empirical Economic Research, 1983/9, Netherlands Economic Institute, Division of Labour-Market Research, Rotterdam, Oct. 1983.

- Holden, K.; D.A. Peel (1975), "The Determinations of Unemployment and the 'UV' relationship", in: Applied Economics, 1975, pp. 251-255.
- Holt, Ch.C. (1970), "How Can the Phillips Curve Be Moved to Reduce Both Inflation and Unemployment?", in: E.S. Phelps e.a., Microeconomic Foundations of Employment and Inflation Theory, Macmillan, London & Basingstoke, 1971, pp. 224-256.
- Koning, J. de (1982), "Interpretation, Volume and Causes of the Shifts in the UV-Relation in the Netherlands in the Period 1947-1980", series: Foundations of Empirical Economic Research, 1982/4, Netherlands Economic Institute, Rotterdam, 1982.
- Kuipers, S.K.; F.H. Buddenberg (1978), "Unemployment on Account of Market Imperfection in the Netherlands Since the Second World War", in: De Economist, 1978, pp. 390-412.
- Muysken, J.; Chr. de Neubourg; H. van der Burg (1982), "Regional and Occupational Labour Market Imperfections, the Netherlands, 1955-1980", Inst. of Econ. Research, Faculty of Economics, Universiteit of Groningen, Research Memorandum nr. 105, aug. 1982.
- Nickel, S.J. (1982), "The Determinants of Equilibrium Unemployment in Great Britain", in: Economic Journal, 1982, pp. 555-575.
- Neubourg, Chr. de (1985), "The Origin and Insignificance of Labour Market Imperfection in the Netherlands: Another Note on the Specification of the UV curve 1955-1980", in: De Economist, 1985, pp. 64-77.
- Ours, J.C. van (1982), "De wisselwerking tussen schaarsteverhoudingen en beloningsstructuur; een empirische analyse van drie bedrijfstakken", in: C.J. van Ours; C. Molenaar; J.A.M. Heijke; De wisselwerking tussen schaarsteverhoudingen in het arbeidsbestel, WWR, V-26, Staatsuitgeverij, 's Gravenhage, 1982, pp. 11-89.
- Reid, F.; N.M. Meltz (1979), "Causes of Shifts in the Unemployment-Vacancy Relationship: An Empirical Analysis for Canada", in: The Review of Economics and Statistics, 1979, pp. 470-475.
- Taylor, J. (1972), "The Behaviour of Unemployment and Unfilled Vacancies: An Alternative View", in: Economic Journal, 1972, pp. 1352-1365.

Serie Research Memoranda (1)

- 1981-1 E. Vogelvang A quarterly econometric model for the Price Formation of Coffee on the World Market
- 1981-2 H.P. Smit Demand and Supply of Natural Rubber, Part I
- 1981-3 R. Vos The political Economy of the Republic of Korea; A proposal for a model framework of an open economy in the ESCAP-region, with emphasis on the Role of the State
- 1981-4 F.C. Palm Structural Econometric Modeling and Time Series Analysis - Towards an Integrated Approach
- 1981-5 P. Nijkamp in co-op. with H.v. Handenhoven and R. Janssen Urban Impact Analysis in a Spatial Context: Methodology and Case Study
- 1981-6 R. Ruben Primaire exporten en economische ontwikkeling
- 1981-7 D.A. Kodde Het genereren en evalueren van voorspellingen van omzet en netto winst: een toegepast kwantitatieve benadering
- 1981-8 B. Out Financiële vraagstukken onder onzekerheid
- 1981-9 P.van Dijck and H. Verbruggen A Constant-Market-Shares Analysis of ASEAN Manufactured Exports to the European Community
- 1981-10 P. Nijkamp, H.de Graaff and E. Sigar A Multidimensional Analysis of Regional Infrastructure and Economic Development
- 1981-11 P. Nijkamp International Conflict Analysis
- 1981-12 A.J. Mathot L'Utilisation du Cr dit lors de l'Achat d'une Voiture
- 1981-13 S.P. van Duin en P.A. Cornelis Onderzoek naar levensomstandigheden en opvattingen over arbeid bij mensen zonder werk, deel I
- 1981-14 W. van Lierop and P. Nijkamp Disaggregate Models of Choice in a Spatial Context
- 1981-15 Hidde P. Smit The World Vehicle Market
- 1981-16 F.C. Palm Structural Econometric Modeling and Time Series Analysis: An Integrated Approach
- 1981-17 F.C. Palm and Th.E. Nijman Linear Regression Using Both Temporally Aggregated and Temporally Disaggregated Data
- 1981-18 F.C. Palm and J.M. Sneek Some econometric Applications of the exact Distribution of the ratio of Two Quadratic Forms in Normal Variates