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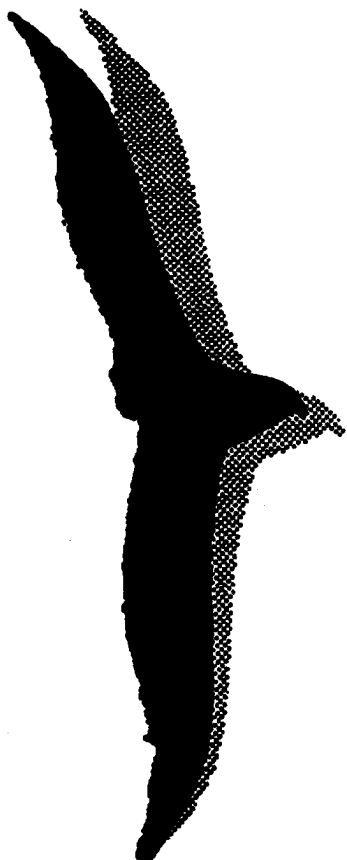
## Serie research memoranda

**Are large firms more efficient in matching jobs  
to job searchers than small firms?**

Lourens **Broersma**

Research Memorandum 1996-10

March 1996



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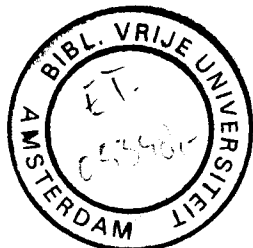
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# ARE LARGE FIRMS MORE EFFICIENT IN MATCHING JOBS TO JOB SEARCHERS THAN SMALL FIRMS?

by



Lourens BROERSMA'

## ABSTRACT

This paper studies the behaviour of firms of different **size** with respect to their behaviour in matching vacant jobs to job searchers. We have **specified** and estimated a matching **function** for firms of different **size** in The Netherlands, according to the number of employees. We found no **difference** in the elasticity of matching jobs to job searchers, but we did find a significant **higher** efficiency of matching jobs to job searchers for **small** firms, compared to larger **firms**. This paper **provides** a number stylized **facts**, based on characteristics of **vacancies** offered by firms of different **size** that give an interpretation of this **difference** in matching **efficiency**. Basically, large firms offer more **vacancies** that require high education, large **firms** offer more part-time **vacancies** and large **firms** look more for employed job searchers and less for unemployed and school leavers.

Keywords: **firm size**, matching function, **efficiency** of matching.

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This paper **benefitted** greatly by the **many** comments of and stimulating discussion with Jan Van Ours.

## 1. INTRODUCTION

For the last two decades, unemployment has been the major **economic** problem in **many** of the Western European countries. Numerous policy measures have been proposed and implemented, but so far unemployment remains high. Lately the emergence and growth potential of small firms has been in focus. Small firms are considered, to a large extent, to be responsible for employment growth, as is argued by **the** seminal paper of Birch (1981) and in various publications of **the** research institutes for small businesses in various countries, like the Small Business Administration (SBA) in the USA and the **Economic** Institute for Medium-Sized and Small Businesses (**EIM**) in The Netherlands. Holzer (1994) shows, using **firm** level data, that small firms have a **higher** vacancy **rate** than large **ones**. Some studies, like Davis et *al.* (1993), stress the **fact** that observed employment growth in small firms is **caused** by statistical pitfalls and that large **firms contribute** more to **employment** growth than small **ones**. Other studies stress that small firms are closely linked to the performance of large firms and should not be **studied** in isolation, like De Jong (1995) for The Netherlands.

These **findings** prompt us to ask if the **process** of matching available jobs to job searchers, is more **efficient** in large than in small **firms**. A **difference** in matching efficiency **may** explain the **difference** in employment growth between **firms** of different **size**. Broersma and Gautier (1995) found that small manufacturing firms in The Netherlands do **contribute** to **employment** growth more than large firms, so we would **expect** small firms to have a **higher** efficiency of matching than large firms.

In order to **address** this question, we **specify** and estimate a matching function, **where** quarterly data of **filled vacancies** by firms of different **size**, *viz.* firms with less **that** 10 employees, firms with 10-99 employees and firms **with** more than 100 employees, are related to the number of **vacancies** in firms of according to that **size and** the total number of job searchers. We assume that these vacancies **can** be **filled** by unemployed and employed job searchers, but **also** by job searchers not in the labour force (non-participants). The observed **difference** in efficiency **can** be interpreted by the **fact** that large firms offer more **higher** educational jobs, they offer more part-time jobs and search more for employed job searchers to **fill** their **vacancies** than small **firms**.

So **indeed**, there is **evidence** that the **process** of matching jobs to job searchers is more **efficient** in small firms than in large **ones**. The next **section** considers the employment behaviour of firms of different **size** in The Netherlands and gives a **specification** of the matching function. The estimation results of **the** matching function of firms of different **size** and the corresponding efficiency levels are the subject of **section** 3. **Section** 4 gives more detailed **evidence** on the relation between efficiency and firms of different **size**. Finally, **section** 5 concludes.

## 2. EMPLOYMENT BY FIRM SIZE

Table 1 presents an overview of the employment behaviour of firms of different **size**. About 40 percent of employment in The Netherlands is **concentrated** in small and medium-sized firms, *i.e.* firms with less than 100 employees. Even the small firms, with less than 10 employees, still **constitute** some 15 percent of employment. In the **economic** upsurge at the end of the 1980's, **the** employment share of these **small firms** rose three **times** the amount of **the** share of firms **with** 10-99 employees. This was lost again in the subsequent **economic** downturn. Large **firms**, with more than 100 employees, witnessed a declining employment share at the end of the 1980's. The subsequent **economic downturn** showed a falling employment share of small firms, while that of large firms rose. **Broersma** and Gautier (1995) show that there are large job and worker flows underlying these net employment **changes** and that **small** firms are important in the process of job creation and job destruction.

\* Table 1 somewhere here \*

A large number of studies have argued the **importance** small businesses in being the engine of employment, productivity growth and innovation in industrialized countries. See e.g. Acs and Audretsch (1989) and the references therein. Holzer (1994) shows, using firm level data, that small **firms** have a **higher** vacancy **rate** than large firms. We **concentrate** on the employment behaviour **and** try to **provide** an explanation for the frequently observed phenomenon that small firms **contribute** more to employment growth than large firms. **Central** is the question whether small firms are more **efficient** in matching jobs to job searchers than large firms.

The efficiency of matching is linked to the concept of the matching function. The matching function describes the flow of job searchers into employment in terms of the stock of job searchers and **the** stock of available jobs. This process of matching job searchers to available jobs is a **time** consuming process of waiting for and looking for an appropriate match. We assume that the flow of job matches in one period is related to the stock variables at **the** start of that period.

$$F_t = cM(V_{t-1}, S_{t-1}), \quad (1)$$

**where**  $F$  is the flow of job matches,  $M$  is the matching function,  $V$  is the stock of available job **vacancies**,  $S$  is the stock of job **searchers** and  $c$  is a **scale** parameter.

The matching function is **the** analogy of an aggregate production function. It shows that labour market flows **generate** delays in the **finding** of both jobs and workers, even **when** the matching process is extremely **efficient**. The efficiency of the matching process in (1) is

represented by  $c$ . Changes in the value of  $c$  capture changes in the characteristics of workers and jobs and changes in search and hiring behaviour. Usually, the matching process is specified as a Cobb-Douglas function with constant returns to scale. Or

$$F_t = c V_{t-1}^\alpha S_{t-1}^{1-\alpha}, \quad (2)$$

where  $\alpha$  is the positive flow elasticity,  $0 < \alpha < 1$ , which gives the effect of the flow of matches to a change in the stock of available jobs or job searchers.

### 3. MATCHING FUNCTION BY FIRM SIZE

In this section we present the results of a specification analysis on the matching function for firms of three different size classes. We will first of all test the assumption of constant returns to scale. This gives us some preliminary information on the value of the matching elasticity and the level of matching efficiency for each size. The next section provides a more indepth discussion of the efficiency in relation to firm size.

The model we start with is equation (2), without assuming of constant returns to scale. When this model is log-linearized and  $i$  refers to the size of the firm, we find,

$$\log F_{i,t} = \mu_i + \alpha \log V_{i,t-1} + \beta \log S_{t-1}. \quad (3)$$

We have quarterly data for 1988.4-1994.4 on the stock of vacancies and the flow of filled vacancies, disaggregated by firm size. The three size classes we distinguish are small firms, with less than 10 employees, medium-sized firms, with 10-99 employees and large firms, with more than 100 employees. This yields  $V_i$  and  $F_i$  in (3). The stock of job searchers,  $S$ , consists of unemployed and employed job searchers and job searchers not in the labour force. We assume that job searchers do not distinguish the size of the firm when applying for a job, so they are willing to fill a vacant job in a firm of any size. We furthermore assume that the stock of employed job searchers is a fraction of total employment. See also Van Ours (1995). Boeri (1995) reports a relatively high fraction of 10 percent for The Netherlands. Scattered labour market surveys for The Netherlands show that some 7 percent of the non-participants search for a job. In other words, the stock of job searchers equals  $S = U + \phi_1 E + \phi_2 N$ , where  $U$  is the number of unemployed,  $E$  is the number of employed,  $N$  is the number of non-participants,  $\phi_1 = 0.10$  and  $\phi_2 = 0.07$ .

We have estimated model (3) using our data on the different size classes jointly, to get a pooled cross-section time series model. For simplicity, we have specified this model as a fixed-effect model. The null hypothesis of  $\alpha + \beta = 1$  yields  $F(1,67) = 0.038$ . This implies that the assumption of constant returns to scale cannot be rejected at any reasonable significance level.

Table 2 gives the estimation results **when** constant returns to scale is imposed and we have relaxed the assumption of a **fixed** elasticity for **each** of the **size** classes. These results show that the matching elasticities in the firms of different **size** are **all** approximately the same, namely O.S. Firm **size** has no effect on the elasticity of job matching. An **F-test** on the restriction of **equal** matching elasticities **across** firms of different **size**, yields  $F(2,66)=0.359$ , which implies that this hypothesis of equal elasticities cannot be rejected either. There is only weak **evidence** that firms with 10-99 employees have a slightly lower elasticity.

\* Table 2 somewhere here \*

**Second** and more important, with the fixed **firm-size effects**, we **can** give a preliminary answer to the question on the efficiency of job matching of firms of different **size**. Table 3, **reports** these efficiencies, with the 95 percent **confidence** interval. This Table shows that there is a significant **difference** in job matching efficiency, **where** small firms, with 1-9 employees are most **efficient**, followed by medium-sized firms, with 10-99 employees. Large firms, **with** more than 100 employees, have lowest **efficiency**.

\* Table 3 somewhere here \*

**However**, before we **can** derive more permanent conclusions, we **will** first conduct a more thorough investigation into this matching **efficiency** using more disaggregated data. Only **then can** we infer with more certainty whether these **difference** in efficiency are really linked to the **size** of the **firm** and **provide** possible explanations.

#### 4. INTERPRETING THE DIFFERENCES IN EFFICIENCY

The **first** argument that **comes** to mind to shade our **finding** that small firms are more efficient in matching jobs to job searchers, is that in reality it is not the **size** of the firm that matters, but instead it is the sector in which the **firm** operates that **causes** the **difference**. One way to examine this premise is to estimate a similar matching function as (3), but with data disaggregated not only by **firm size**, but **also** by sector. Assuming constant returns to scale,

$$\log\left(\frac{F_{s,i,t}}{S_{s,t-1}}\right) = \mu_{s,i} + \alpha_i \log\left(\frac{V_{s,i,t-1}}{S_{s,t-1}}\right) + \epsilon_{s,i,t} \quad (4)$$

**where** index  $s$  refers to sector and  $i$  refers to **firm size**. As a **first** step, Table 4 presents **the**

employment by sector and firm **size** in The Netherlands for 1994. Employment in **small firms** is particularly high in agriculture and commercial services. Large firms are important in **the** non-commercial service sector. The overall employment share of small firms in commercial services is relatively high.

\* Table 4 somewhere here \*

In order to assess whether it is in **fact** the sector that **causes** the differences in matching efficiency and not **the firm size**, we have estimated model (4) using quarterly data **disaggregated** to sector and **firm size**. If this model yields the same **ordering** in **the** matching efficiency for **all** sectors as our model in Table 2, we **can** safely **state** that **the** differences in matching efficiency found earlier are not **caused** **sectoral** differences in efficiency.

Table 5 shows **the** estimation results for the matching model (4). Opposite to **the** model in Table 2 we do **find** here that there is a significant **difference** in matching elasticity between **firms** of different **size**. A standard **F-test** on the equality of the matching elasticities yields  $F(2,480)=8.484$ . In Table 2, these elasticities were approximately equal. If the equality of matching elasticities is nevertheless imposed on the model of Table 5, we **find** a similar value as in Table 2, *viz.* 0.516.

\* Table 5 somewhere here \*

If we consider the **efficiency** of matching of the model in Table 5, then we do **find** that in **each** sector, with a possible exception of construction, **efficiency** is highest for **small** firms and lowest in large firms. This **result** corroborates our conclusions from Table 3. The **difference** in efficiency by **firms** of different **size** is particularly strong in agriculture, wholesale and retail trade and in the **banking** sector, whereas it is relatively small between firms with 1-9 and with 10-99 employees in manufacturing, transport and non-commercial services. **All** in all, we **find** that the sector a firm of **specific size** operates in hardly **affects** the ranking of their matching **efficiency**. This **means that** the differences in matching efficiency between firms of different **size** are not related to the sector. **Can** we sort **out** the **mechanisms** through which this effect occurs?

We **can** pose several hypotheses in order to interpret the differences in matching efficiency between small and large firms, which **will** later be investigated. First, it **may well** be the case that small firms have less **vacancies** for highly educated **persons** than **large** firms. The **higher** the education needed to **fill** a vacancy, the **longer** it takes to fill the vacancy. **Second**,



small firms **may** have less part-time **vacancies** to offer than large firms. It takes more **time** to fill a part-time vacancy than a full-time vacancy, because the majority of job searchers wants a full-time job. In **the** Labour Population Survey by **Statistics** Netherlands for the early 1990's some 20 percent of the vacant jobs were of less than 20 hour per week. At **the** same **time**, no more than 20 percent of the unemployed searched for a job of less **than** 20 hours and only 10 percent of employed **persons** working more than 20 hours searched for a job of less than 20 hours. This implies that it is relatively difficult to match a part-time job searcher to a part-time vacancy. Third, in large firms a vacancy is more **often** still occupied, whereas in a small firms it is not. This **means** that **vacancies** in small firms **can** be **filled** more quickly **than** in large firms. Fourth, large **firms** have more **vacancies** that are difficult to fill than small firms. This premise is related to our **first** hypothesis that large firms offer more jobs for which a high education is required than small **firms**. Fifth, small firms have more **vacancies** for school leavers **than** large firms. This implies that large firms **rely** more on job-to-job movers to **fill** their **vacancies**, **who** are generally restricted by a **specific** term of **notice** before they **can** move to another job. Sixth, large firms spend more **time** searching for a suitable **candidate** than small firms, because large firms **often** have a recruitment department, with a well-trained staff, to do so. Seventh, small firms tend to report a vacancy to the Public Employment Office (PEO) more **often** than do large firms. Van Ours (1994) shows that mainly unemployed job searchers are reached **when** a vacancy is reported to **the** PEO. In combination with point **five**, this implies that large firms more **often** look for employed job searchers, whereas small firms more **often** look for school leavers and unemployed to fill their **vacancies**.

**Tables** 6, 7 and 8 present **evidence** on these hypotheses for 1990-1994 and 1993-1994 in The Netherlands. In Table 6, the percentage of **vacancies** by **size** and level of education are presented. What immediately becomes **clear** is that large firms have more **vacancies** for **higher** educated **persons** (level 5 and 6) than small firms. In small firms only some 17 percent of the **vacancies** need **higher** educated **persons**, whereas for large firms this is 25 percent of the number of **vacancies**. A vacancy that **needs** a high level of education is relatively difficult to **fill**. Hence, this might **very well** be a reason for large firms to be less **efficient** in matching **vacancies** to job searchers.

\* **Tables** 6, 7 and 8 somewhere here \*

A **longer** vacancy duration implies the **firm** **needs** a **longer time** to search and more **vacancies** **may** be labelled 'difficult to fill'. Information on search **time** and other **characteristics** are presented in Table 7. Table 7 shows **that** small and medium sized firms **fill** about 60 percent of their **vacancies** within three months. Large firms, **however**, have **filled** only 50 percent of their **vacancies** in that period. So, the **fact** that large **firms** offer more **vacancies**

that require a high education, which **may cause** more search **time**, is **confirmed** by the **fact** that **indeed** large firms search **longer** than small **ones** to **fill** their **vacancies**. On the other hand, Table 7 and **also** Table 8 show that this does not imply that large **firms** have more **vacancies** that are difficult to **fill**. In **fact**, small firms have the highest proportion of **vacancies** difficult to **fill**. In other words, this outcome does not **confirm** our hypothesis. Nevertheless, the concept of a vacancy being ‘difficult to **fill**’ is a bit tricky. In the questionnaire, **firms can** label **vacancies** ‘difficult to **fill**’ at their own discretion; there are no **objective** criteria that underlie **this** concept. It **may**, therefore, **very well** be the case that small firms have the perception that a vacancy is difficult to fill in an earlier stage than large firms. The **fact** that large firms usually have a **specific** and well-trained recruiting **department**, whereas in a small **firm** the manager usually does the hiring, **may** give rise to that **difference** in perception.

Table 7 shows that some 20 percent of the **vacancies** offered by small **firms** are part-time, whereas for large firms this is 30 percent. Table 8 **indicates** that this is especially true for **vacancies** with education level 3 and 4. This in itself **may** explain why matching job searchers and **vacancies** is less **efficient** for large firms. There are relatively few part-time **vacancies** and **also** relatively few job searchers searching for a part-time job. From a matching point of view, this **means** that those jobs and job searchers are difficult to match. Of course, the same is true for small and medium-sized firms, but their part-time **vacancies** are roughly equal to or smaller than the **vacancies** that are difficult to **fill**. In those **size** classes part-time **vacancies may** be among the ‘difficult to **fill**’. For large firms this is not the case. Moreover, Table 4 revealed that employment in large firms is **concentrated** in the non-commercial sector (**SBI** 9). In that sector we typically **find** institutions of education, health **care** and government. They **also** offer most of the part-time jobs.

According to Table 7, large firms offer less **vacancies** for school leavers **than** small **ones**. This is particularly the case at a medium and **higher** educational level. If we assume that none of **the** firms prefers unemployed over other job searchers, this implies that large **firms** **depend** more on employed job searchers to **fill** their **vacancies** than small **ones**. Since employed job searchers, in particular those with a **higher** education, have a minimum term of **notice**, this **means** it takes more **time** for a large **firm** to **fill** a vacancy, **and** hence the matching **process** is less **efficient**.

There is hardly **any difference** between firm **size** and the **fact** whether a vacancy is still occupied, *i.e.* the employee **filling** the vacancy has not yet left. For **all** firms this amounts to some 20 percent of **all vacancies**. There is only weak **evidence** from Table 8 that in large firms **vacancies** requiring **higher** education are more **often** still occupied **than** in small firms. If this were true, it would **mean** that small firms have to start searching earlier than large firms. The **latter can afford** to wait until the job is **left**. This **also** implies a lower efficiency of matching for large firms.

Finally, small firms more **often** report a vacancy to the Public Employment Office (PEO) **than** large firms. This is probably linked to level of education of the **vacancies**. **Vacancies** that require only a low education are more **often** reported to **the** PEO and these **vacancies** are **concentrated** in small firms. On the other hand, large **firms** more **often** post their vacancy in newspapers and the like. Van Ours (1994) and Lindeboom et *al.* (1994) show that advertisement basically reaches employed job searchers, whereas reporting to the PEO basically reaches unemployed job searchers. This confirms our premise that large firms more **often** look of employed job searchers, which results in a **longer** vacancy duration.

Summarizing, we **can state** that **several** characteristics of **vacancies** offered by firms of different **size may** lead to **longer** vacancy duration, and hence less efficient job matching, in large **firms**. Large firms tend to offer more **vacancies** that require **higher** education than small firms. Large firms offer more part-time **vacancies** than small firms. Large **firms** offer less **vacancies** for school leavers and unemployed and more for employed job searchers than small firms. **All** these observations lead to **longer** vacancy durations and hence lower matching **efficiency** for large firms.

## 5. CONCLUDING REMARKS

This paper has investigated whether there exists a **difference** between firms of different **size**, with respect to their efficiency of matching jobs to job searchers. First of all, we found no significant **difference** in the matching elasticity between firms of different **size**. This implies that **all** firms **benefit** in the same way from an increase in the number of job searchers. We implicitly assume that job searchers search for **any** appropriate job, irrespective of the **size** of **the** firm. We did **find, however**, that small **firms** are significantly more efficient in matching vacant jobs to job searchers than **large(r)** firms. **This may provide** one possible explanation for the frequently observed phenomenon that small firms **contribute** more to the growth of employment than large firms.

The empirical investigation we have conducted gives no **evidence** for the premise that in **fact** the **sectoral** differences between firms **cause** this **difference** in matching efficiency. We do give a number of possible interpretations for this **difference**. We find that large firms offer more **vacancies** requiring a high level of education than small firms. Large firms **also** offer more part-time **vacancies** than small **ones**. Finally, large firms tend to look for employed job searchers to **fill** their **vacancies**, whereas small firms tend to look more for school leavers and unemployed. These **facts** increase the vacancy duration of large firms and thus **provide** an explanation for the low **efficiency** of matching for large firms that we have observed.

## REFERENCES

- Acs, Z.J. and D.B. Audretsch, 1989, 'Editor's Introduction' *Small Business Economics*, 1, 1-5.
- Birch, D.L., 1979, 'Who Creates Jobs?', *Public Interest*, 65, 3-14.
- Boeri, T., 1995, 'On the Job Search and Unemployment Duration', EUI Discussion Paper No. 38.
- Broersma, L., 1996, 'Job Searchers, Job Matches and the Elasticity of Matching' Research Memorandum No. 4, Free University Amsterdam.
- Broersma, L. and P.A. Gautier, 1995, 'Job Creation and Job Destruction by Small Firms: An Empirical Investigation for the Dutch Manufacturing Sector', forthcoming in *Small Business Economics*.
- Davis, S. J. Haltiwanger and S. Shuh, 1993, 'Small Business and Job Creation: Dissecting the Myth and Reassessing the Facts', NBER Working Paper No. 4492, Cambridge MA.
- De Jong, H.W., 1995, 'Prestaties van grote ondernemingen' (Achievements of large enterprises), *Economisch Statistische Berichten*, 80, 22 maart 1995 (in Dutch).
- Holzer, H.J., (1994), 'Job Vacancy Rates in the Firm: An Empirical Analysis', *Economica*, 61, 17-36.
- Lindeboom, M., J.C. Van Ours and G. Renes, 1994, 'Matching Employers and Workers: An Empirical Analysis of the Effectiveness of Search', *Oxford Economic Papers*, 46, 45-67.
- Van Ours, J.C., 1994, 'Matching Unemployed and Vacancies at the Public Employment Office', *Empirical Economics*, 19, 37-54.
- Van Ours, J.C., 1995, 'An Empirical Note On Employed and Unemployed Job Search', *Economics Letters*, 49, 447-452.

**DATA APPENDIX**

- $F_{i,t}$  Flow of **filled vacancies** by **firm size  $i$**  in period  $t$ .  
source: **Central** Bureau of Statistics, ***Sociaal economische maandstatistiek***.
- $V_{i,t}$  Number of vacant job by **firm size  $i$**  in period  $t$ .  
source: **Central** Bureau of Statistics, ***Sociaal economische maandstatistiek***.
- $S_t$  Number of job searchers, defined as  $S_t = U_t + 0.10E_t + 0.07N_t$ , where
- $U_t$  Number of registered unemployed in period  $t$ .  
source: **Central** Bureau of Statistics, ***Sociaal economische maandstatistiek***.
- $E_t$  Number of employed in period  $t$ .  
source: **Central** Bureau of Statistics, ***Sociaal economische maandstatistiek***.
- $N_t$  Number of **persons** not in the labour force in period  $t$ , which is determined as  $P1464 - E - U$  and
- $P1464$ , Population of working age, **i.e.** from 14 to 64 years old, in period  $t$ .  
source: Central Bureau of Statistics, ***Statistical Yearbook***. **The** quarterly series has been constructed through interpolation.

The data on **vacancies** and **filled vacancies** by sector and **firm size**, used to estimated the model of Table 5, are unpublished series by the **Central** Bureau of Statistics. The job searchers are assumed not to distinguish **firm size** in their search behaviour, but employed job searchers are assumed to search for another job in the same sector. Cf. **Broersma** (1996).

**Table 1. Average employment share and growth of employment share of firms of different size in different periods in The Netherlands, in percentages.**

	employment share			growth of employment share		
	< 10	10-99	> 100	< 10	10-99	> 100
1989.1-1990.4	16.9	27.4	55.7	0.15	0.05	-0.07
1991.1-1994.4	15.0	27.7	57.2	-0.47	-0.16	0.21
1989.1-1994.4	15.7	27.6	56.7	-0.26	-0.09	0.12

Source: CBS, Sociaal economische maandstatistiek.

**Table 2. Estimation results of model (3), based on pooled cross-section time series.**

Dependent variable:	$\log(F_{i,t}/S_{i,t-1})$			
<b>constant</b>	-0.996	(-7.413)	-1.048	(-11.44)
<b>group dummies</b>				
D <sub>10-99</sub>	-0.230	(-1.128)	-0.076	(-2.578)
D <sub>&gt;100</sub>	-0.179	(-0.713)	-0.198	(-6.714)
<b>log of VS-ratio in t-1 for</b>				
firms with 1-9 employees	0.526	(14.77)		
firms with 10-99 employees	0.485	(12.14)		
firms with more than 100 employees	0.532	(9.173)		
all firms			0.512	(21.40)
<hr/>				
<b>R<sup>2</sup></b>	0.879		0.877	
<b>σ</b>	0.103		0.102	
<b>n×T</b>	72		72	

**Table 3. Labour market efficiency by firm size, based on Table 2 column 2.**

Labour market efficiency for		95 percent confidence interval
firms with 1-9 employees”	1	
firms with 10-99 employees	0.927	[0.875 - 0.9821
firms with > 100 employees	0.820	[0.774 - 0.8691

<sup>a</sup> efficiency for firms with 1-9 employees has been normalized to 1



**Table 4. Employment share by sector and size in 1994, percentage of total employment.**

No. of employees	agr.	mfg./con.	comm.s.	non-comm. s	total
1-9	56	11	22	7	15
10-99	34	34	28	20	27
> 100	10	55	50	73	58
total	100	100	100	100	100
Employment-share"	2	24	43	31	100

<sup>a</sup> Share of sector in total number of jobs (in percentages).

Source: CBS, Sociaal economische maandstatistiek.

**Table 5. Estimation results of matching model, based on pooled cross-section time series by sector and firm size.**

Dependent variable:		$\log(F_{s,i,t}/S_{s,t-1})$	
sector $s$	size $i$		
<i>group dummies</i>			
agriculture	1-9	-1.347	(9.116)
	10-99	-2.171	(10.94)
	> 100	-4.097	(15.76)
manufacturing	1-9	-1.598	(11.13)
	10-99	-1.634	(11.39)
	> 100	-2.318	(17.94)
construction	1-9	-1.649	(12.03)
	10-99	-1.645	(10.96)
	> 100	-2.967	(16.69)
trade	1-9	-1.304	(9.359)
	10-99	-1.727	(10.16)
	> 100	-2.547	(14.75)
transport	1-9	-1.629	(9.702)
	10-99	-1.743	(9.424)
	> 100	-2.968	(17.65)
banks	1-9	-1.770	(11.69)
	10-99	-2.237	(12.72)
	> 100	-3.085	(18.61)
non-comm. s.	1-9	-1.401	(9.953)
	10-99	-1.601	(9.902)
	> 100	-1.706	(13.04)
<i>log of VS-ratio in t-1</i>			
all	1-9	0.579	(22.94)
	10-99	0.532	(18.38)
	> 100	0.426	(15.34)
R <sup>2</sup>		0.943	
$\sigma$		0.239	
n×T		504	

**Table 6. Vacancies by firm size and level of education, averages of 1993-1994 in percentages of the total vacancies per size class.**

education level"		2	3	4	5	6	unknown	all
size	1-9	1.5	43.5	36.5	15.0	2.0	1.5	100.0
	10-99	1.0	43.0	32.5	18.0	3.0	2.5	100.0
	> 100	2.0	29.5	33.0	21.5	3.5	10.5	100.0
	all	2.0	37.0	34.0	19.0	3.0	5.0	100.0

<sup>a</sup> 2: primary level education; 3: lower general and vocation education; 4: preparatory higher and scientific education and intermediate vocational education; 5: first phase of higher vocational and scientific education; 6: second phase of higher vocational and scientific education.

Source: CBS, Vacancy Survey.

**Table 7. Vacancies (x 1000) by firm size and other characteristics, 1990-1994.**

vacancy		for school leaver	< 20 hrs	still filled	search < 1 m.	diffkult 1-3 m. to fill	reported at PEO <sup>a</sup>	total
size	1-9	40	20	18	35	23	31	19.5
	10-99	37	15	17	35	25	30	20.4
	> 100	34	28	18	31	21	27	24.6
	all	39	21	17	34	23	31	64.5

<sup>a</sup> PEO: Public Employment Office  
Source: CBS, Vacancy Survey.

**Table 8. Vacancies by firm size, education level and other characteristics, 1993-1994.**

size	education <sup>a</sup>	vacancies (×1000)	school leavers (%)	< 20h. (%)	still occupied (%)	search < 1 m. 1-3 m. (%) (%)		advertise (%)	PEO (%)	difficult to ml (%)
1-9	2	0.2								
	3	4.5	48.5	21.5	17.0	44.0	16.5	26.0	37.0	29.5
	4	3.9	26.0	16.0	24.0	49.0	13.5	26.0	27.0	25.0
	5	1.6	14.0	18.5	14.0	34.5	20.5	34.5	21.5	30.0
	6	0.2								
	unknown	0.2								
10-99	2	0.1								
	3	4.5	58.5	19.5	16.0	47.0	28.0	31.5	25.5	18.5
	4	3.4	29.5	10.5	24.0	49.0	19.5	42.5	24.5	22.0
	5	1.9	13.5	8.0	19.0	34.0	31.5	52.5	13.5	27.0
	6	0.4								
	unknown	0.3								
> 100	2	0.4								
	3	4.5	54.5	33.5	18.5	47.5	16.0	29.0	32.5	7.0
	4	5.1	23.0	20.0	25.5	40.5	19.5	34.0	22.0	13.0
	5	3.4	10.5	9.0	23.0	29.5	26.0	47.0	18.0	24.0
	6	0.6								
	unknown	1.6								

<sup>a</sup> 2: primary level education; 3: lower general and vocation education; 4: preparatory higher and scientific education and intermediate vocational education; 5: first phase of higher vocational and scientific education; 6: second phase of higher vocational and scientific education.

Education levels 2 and 6 have been omitted due to observations falling below the threshold of 100 vacancies.

Source: CBS, Vacancy Survey.