CENTRE FOR LABOUR MARKET AND SOCIAL RESEARCH
UNIVERSITY OF AARHUS AND THE AARHUS SCHOOL OF BUSINESS

Job Creation and Destruction, Worker Reallocation and Wages

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Working Paper 97-04
April 1997

Published by

Centre for Labour Market and Social Research
Science Park Aarhus
Gustav Wieds Vej 10C, 8000 Aarhus C, Denmark

Editor: Henning Bunzel

ISSN 0908-8962

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JEL classifications: J

Keywords: Job Creation, Worker Reallocation, Wages, Business Cycle

Abstract

Using Danish firm level data on employment dynamics merged with individual records on all workers in a given firm, various measures of employment and worker reallocation used in the macroeconomics literature are incorporated in a wage equation framework. The effects of job creation/destruction and worker reallocation are estimated using standard panel data techniques. Brief results will go here !!!!!

Acknowledgement

The author would like to thank the Centre for Labour Market and Social Research (Aarhus, Denmark) and the European University Institute (San Domenico di Fiesole, Italy) for their hospitality. Conversations with Paul Bingley, Francis Kramarz, and Niels Westergård-Nielsen are gratefully acknowledged. The usual disclaimer applies.

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1. Introduction

The dynamic features of labor markets and, more particularly, the flows in and out of unemployment have always offered serious challenges to both macro and micro economists. Micro economists have traditionally focused on the composition of unemployment while macro economists have paid enormous attention to its cyclical behavior. More recently, while both Europe and the United States experienced relatively high rates of unemployment, the "Matching" approach to labor market flows has become increasingly popular among those interested in modeling the cyclical behavior of unemployment-employment and employment-unemployment flows using time series data.[1]

Although data on gross labor market flows are able to capture worker turnover and its behavior over the business cycle, they reveal very little (perhaps nothing) about the causes of mobility. Consequently, the nature of the driving economic forces behind worker turnovers has simultaneously raised enormous interest and led economists to investigate the notion of job (employment) reallocation using plant level data. In a series of papers, Davis and Haltiwanger (1990, 1992) have investigated the cyclical behavior of gross job flows (job creation and destruction) in US manufacturing. They report that both significant job creation and destruction coexist at all phases of the business cycle. In particular, the coexistence of both job creation and destruction within narrowly defined industries points out to the importance of firm heterogeneity. They also report that job destruction (strongly counter-cyclical) is more variable than job creation (more or less acyclical) and that, as a consequence, the driving force behind recessions and expansions is job destruction (not job creation). As similar results have been found for European countries (see Burda and Wyplosz, 1994 for a review), theoretical models compatible with those findings have recently been developed and potential explanations for the asymmetric behavior of job creation and destruction have also been advanced. [2]

Despite the increasingly large number of studies concerned with either worker flows or job reallocation, remarkably few studies have tried to analyze both phenomena in conjunction with economic variables at a micro-economic level. For instance, nothing is known about the effect of firm employment reallocation on wages although labor economists have recognized for a

[1] Blanchard and Diamond (1992) use the term "flow approach" to designate a series of papers devoted to the understanding of the dynamics of workers and job flows.

[2] Possible explanantions for the asymmetric behavior of job creation and destruction include the following. Technological progress, non-convexities in adjustment costs functions explained by fixed firing costs, reallocation is more efficient in periods of low productivity and passive learning about firm's initial condition. Blanchard and Diamond (1990) review several of these explanations.It should however be pointed out that none of these hypotheses has, so far, imposed itself as conclusive. The development of models compatible with simultaneous creation and destruction still represents a challenge for current researchers.

long time the potential importance of firm characteristics in models of wages and human capital. Most likely, the absence of data where firm attributes and individual characteristics are merged has prevented labor economists to go beyond including firm size in standard wage equations[3]. The recent development of data containing firm as well as worker information is however likely to remove this oversight.[4]

Introducing firm employment dynamics (job creation/destruction and job reallocation) in a model of wages and human capital might be justified for four (4) main reasons. First, if firms expanding faster than average pay more (say in order to attract workers), failure to take into account firm expansion (or decline) might seriously bias estimates for the return on human capital investment such as education, experience or tenure. Secondly, analyzing wages jointly with firm employment reallocation policies might shed light on the nature of firm heterogeneity (pointed out by Davis and Haltiwanger, 1992) and therefore help understand how labor force composition within a firm may affect its expansion rate. Thirdly, estimates of the sensitivity of wages to job creation and destruction provide an alternative way of measuring the sensitivity of wages to the business cycle. This is especially true if a relatively large proportion of job creation/destruction is not explained solely by business cycles conditions.[5] Finally, the sensitivity of wages to job creation/destruction can reveal information about wage flexibility in a particular labor market and can also contribute to the understanding of the Europe/ US unemployment differential (see Bertola and Rogerson, 1996).[6]

The main findings may be summarized as follows. There is empirical evidence that workers employed in firms either creating jobs or firms reallocating employment (firms with a high level of turnover) tend to receive higher wages given their stock of human capital. ?????

The paper is constructed as follows. In the next section, I state briefly the objectives which I pursue in this study. The third section is devoted to the presentation of the data set used in the study. The econometric specifications are presented in section 4 while results are discussed in section 5. Some potential avenues for research are identified in the concluding section.

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[3] For an overview of the literature on wages and firm size, see Brown and Medoff (1989).

[4] In a recent paper, Abowd, Kramarz and Margolis (1994) have analyzed a relatively large panel of French private sector firms (or enterprises) and workers and they have investigated the correlation between worker and firm effects.

[5] In the case where job creation/destruction patterns affect wages and are, at the same time, correlated with business cycle conditions, estimates of the sensitivity of real wages to business cycle conditions, obtained from models ignoring job creation/destruction patterns, would obviously suffer the "omitted variable" bias.

[6] The argument is that institutional differences affecting the way wages offered by firms depend on business cycle conditions will also affect the employment adjustments following a positive (or negative) labor demand shock.

2. Objectives

This paper constitutes a first attempt (to my knowledge) to analyze employment reallocation and wages simultaneously. In what follows, I analyze individual longitudinal data on Danish workers along with firm data on employment (size) changes over a period of 12 years. The data set is quite unique and will be presented in section 3.

The main objective is to introduce notions of gross and net job reallocation in a standard human capital framework. To do so, I estimate a standard wage regression equation in conjunction with sample information on firm's job creation and destruction histories using standard panel data methods. Although the data set used in the paper would undoubtedly enable researchers to investigate a very large number of economic issues (some of them will be discussed when I address potential avenues for research), I pay a particular attention to three (3) broad classes of questions;

- The effects on wages of net job creation (or destruction) and worker reallocation after controlling for human capital and the sensitivity of the estimates of the return to human capital to the inclusion of firm employment dynamics variables.
- The robustness of the effects of job creation/destruction and worker reallocation on wages to the inclusion of a business cycle measure (namely the rate of unemployment).
- The interaction between job creation/destruction (as well as worker reallocation) and some workers characteristics such as age, education, experience and tenure.

To do so, I specify log hourly wage equations using standard human capital arguments but I incorporate measures of job creation/destruction and worker reallocation as they are defined in the recent macroeconomic literature and treat them as time varying regressors. Note that both of these notions play a central role in modern macroeconomic models in which labor market search is present. In the IDA data set, I can measure net job creation/destruction quite accurately. In order to evaluate the extent of worker reallocation, I measure the sum of all accessions (those who had no attachment with the current firm in the previous year) and all separations (those who have no attachment with the firm in the following year) and I treat this worker reallocation variable (indicating the amount of turnover in a given firm for a particular year) as an indicator for gross employment reallocation.

3. The IDA Data Set

3.1. Introductory Remarks

The empirical analysis presented in the paper has been carried on the Integrated Data Base for Labor Market Research (IDA) which has been recently created by Danish Statistics from the entire population of Danish firms and Danish workers. The IDA data set is a longitudinal data base (with annual observations) starting in 1980 and it contains both private and public firms. Total employment for each firm is recorded as of November of each year. It is therefore easy to follow the job creation and destruction patterns for each firm over the 1980-1991 period.

Although the unit of reference in the IDA data set is the firm, it also contains information on each employed individual as of the last week of November. This information is actually obtained by registered data on all Danish labor force participants. It is therefore possible to follow individual wages over a maximum of twelve (12) year for a given individual. Generally speaking, the data set contains more information about workers than firms. For instance, profitability and productivity variables are not available for confidentiality issues.

The relatively long period over which information has been collected is interesting for microeconomic and macroeconomic reasons. With the availability of several observations on both firms and workers, individual and firm effects can more easily be identified from structural effects of interest. Also, data on the period covering 1980 until 1991 imply that we observe a full business cycle. The important stages are described as follows; a recession from the beginning of the sample until 1982, an expansion from 1983 until 1986 and a relative stagnation from the late eighties until 1991.

3.2. Sampling Method

In this study, I work with a sample extracted from the original database[7]. I analyze a random sample of 5% of all private sector workplaces (establishments). This amounts to 1,000 Danish workplaces. Only private sector workplaces with 5 to 500 primary employees have been sampled[8]. They were selected based on a identification number randomly generated to all firms

[7] The entire IDA population of firms is used to investigate the cyclical behavior of worker and job flows in Albaek and Sørensen (1994) while the sample used in this paper is also used by Bingley and Westergård-Nielsen (1995) in order to investigate individual wage growth within and between establishments.

[8] A primary employee is an employee whose main source of earnings is his/her salary with this particular worplace.

in the population. A workplace is a legally registered unit which a single physical address. In Denmark, approximately 30% of establishments are actual firms while the remaining 30% of workplaces belong to multi-plant firms. Identification of multi-plant firms from single plant firm is not possible in the sample that I have. These firms were created either in or before 1980 and they are followed until the end of the sample period (1991). As firms disappear (either for bankruptcy or any other reason), new firms are added to the sample so that the total number of firms (in a given year) always exceeds 1000. The re-sampling of firms was done with the restriction that newly added firms would be of a similar size (within a range of 10 employees). Firms either in the agricultural or mining sector have been excluded.

For all firms in my sample, workers attached to the workplace (as of November of each particular year) are matched and information is gathered by Statistics Danmark through various administrative registers. Information at the worker level contains education, experience, earnings, hours of work, occupation, marital status and number of children. Experience is the number of years of actual employment recorded by the mandatory labor market pension administration (ATP). Earnings data come from tax records while hours of worked come from ATP files. Both are used to compute an hourly wage rate. One of the distinctive features of IDA is that total cumulated experience (measured as the sum of all employment periods since entering the labor force) is reported and therefore allows me to avoid potential experience measures which are typically used in the literature. As a consequence, I am able to identify age effects from experience effects. Furthermore, as the sample contains a sufficiently large number of individuals who acquire additional education after having entered the labor force, I can also estimate the effects of education in a fixed effects framework. Note that the structure of the data also enables to construct a tenure variable even though tenure is not reported per se. However, this variable is left censored for those whose employment relationship was initiated before 1980.

At the level of the workplace, I have information on ownership type, size (used to compute job creation/destruction), region (8 administrative regions) and industry. Industry is a single digit SIC classification which has actually been aggregated from a three digit occupation.

The criteria for being in the sample are as follows. First, the wage reported must be valid; that is neither 0 (approximately 7% of all observations have a wage of 0) nor top coded at 500 DKr per hour (only 0.1% of the observations are top coded). I restrict the sample to full-time workers only (25 hours per week or more). As Danish Statistics impute a quality index for each wage reported in registered data, I only analyze individual observations which have the

maximum quality (that is the minimum measurement error).[9] It should be noted that none of these conditions imply any restrictions on firms. After imposing those restrictions, I am left with 40,000 observations for males (number of individuals multiplied by periods) and 20,000 for females. On average, every individual is observed between 3 or 4 times in the sample.
As the original data set is quite large, it is possible (actually, more convenient) to stratify my sample based on sex and date of birth . As a result, I work with four (4) different samples;

- Males aged between 35-40 (in1981)
- Males aged between 30-34 (in 1981)
- Females between 35-40 (in 1981)
- Females between 30-34 (in 1981)

Finally, as the tenure variable available is only reliable from 1980 onward, it means that tenure for every job started before 1980 is left censored and cannot be included. Sampling only individuals who have started a new job beyond 1980 would introduce clear selection-bias as those individuals more mobile would be more likely to be sampled. As a consequence, I select a sample of new entrants. I define a new entrant who has entered the labor force (one of the sampled firm) with no prior experience reported (total experience is not left censored). This means that I can incorporate tenure (to analyze how job creation/destruction interacts with tenure) on two samples of relatively young workers;

- Males entering the labor market between 1981 and 1991.
- Females entering the labor market between 1981 and 1991.

Sample statistics for each sample is presented in appendix 1.

4. The Econometric Methodology

The econometric estimates presented in this study are based generally on standard wages regression functions. We begin by considering earnings regression equations which are specified according to human capital theory but also incorporate firm characteristics and, in particular, firms job creation/destruction and reallocation histories. Initially, these variables are assumed to be exogenous. Subsequently, I proceed with models where job creation and destruction are allowed to be endogenous[10].

[9] It turns out that for full time workers, the fraction of observation discarded is 8% only.
[10] Given the structure of the IDA data set, it is however impossible to incorporate match specific effects. In order to do so, I would need to observe individuals employed with distinct firms for a relatively long period.

4.1. The Wage Regression Function

The basic wage regression function is represented as follows:

$$Logw_{ijt} = X_{it}\beta + Z_i\alpha + W_{jt}\lambda + S_{jt}\gamma + \Psi_{jt}\left(E_{jt}, E_{jt-1}\right)\theta + \delta_t + \eta_i + \vartheta_j + \epsilon_{it} \qquad (1)$$

where w_{ijt} denotes the real hourly wage rate of individual i, employed in firm j at time t and E_{js} denotes employment of firm j at time s. X_{it} is a vector of time varying individual specific regressors such as age, experience and education. The vector Z_i contains individual specific regressors which are time invariant (sex, occupation). Firm specific time invariant attributes such as region and industry are contained in W_{ijt} while the scalar S_{jt} represents the size of firm j at time t. S_{jt} is computed as follows;

$$S_{jt} = \frac{E_{jt} + E_{jt-1}}{2} \qquad (2)$$

Individual specific effects are represented by the term η_i while δ_t plays the role of a time specific effect. The function Ψ_{jt} represents potential measures of job creation and destruction patterns. In this paper, we consider measures of job creation/destruction similar to those used in the macroeconomic literature. I define job creation, χ_{jt}, as

$$\chi_{jt} = \frac{E_{jt} - E_{jt-1}}{S_{jt}} \qquad (3)$$

Finally, I also work with a gross job reallocation rate. If we denote the number of new entrants in firm j at time t by N_{jt} and the number of individuals exiting firm j at time t by M_{jt}, then the gross job reallocation rate, ς_{jt}, is given by[11]

$$\varsigma_{jt} = \frac{N_{jt} + M_{jt}}{S_{jt}} \qquad (4)$$

The error term, ε_{it}, is assumed to follow a normal distribution

$$\varepsilon_{it} \sim i.i.d.N(0, \sigma_\varepsilon^2)$$

It is important to note that

[11] As χ_{jt} and ς_{jt} represent a lower bound and an upper bound for employment reallocation, I also work with an average of these values and estimate how this average affects wages.

- I ignore the introduction of firm specific effects as practically no worker is observed in a different firm[12].
- I ignore mobility as wages of job leavers are typically unknown.

Estimation methods for equation (1) vary according to whether or not η is assumed to be fixed (a nuisance parameter) or random.

- When η is assumed to be a fixed (unknown) parameter,

least squares are typically applied to a modified equation (1) where regressors are measured in deviations from mean or, occasionally, in first differences.

- When individual effects are assumed to be random,

$$\eta_i \sim i.i.d.N(0, \sigma_\eta^2)$$

generalized least squares techniques are applied to (1).

The advantages and disadvantages of each approach are relatively well known to labor economists. Fixed effects techniques imply an important reduction in degrees of freedom when the number of individuals (i in this case) is big. Furthermore, fixed effects techniques do not allow to estimate the effect of time invariant regressors. Random effect models, which assume that the individual effect is a random variable, require to estimate a much smaller number of parameters and also allow time invariant regressor. However, potential correlation between individual effects and regressors (possible when regressors are endogenous) may constitute a serious drawback. Hausman (1979) has proposed the following specification test based on the observed difference between the random effect estimator (δ_{gls}) and the fixed effect estimator (δ_w);

$$\mathbf{H} = (\delta_{gls} - \delta_w)' \left[Var(\delta_w) - Var(\delta_{gls})\right]^{-1} (\delta_{gls} - \delta_w) \tag{5}$$

As the fixed effects estimator is always consistent, a larger value of **H** provides evidence in favor of the fixed effect estimator.

5. Results

In this section, I discuss the main empirical results. First, I will describe those obtained from model specifications where firm employment dynamics variables are incorporated in a standard regression model (with no business cycle variables except for a time specific effects) and no

[12] In my sample of males, only.....are observed in a different firms. In the sample of females, only.....

interaction. In Section 5.2 I analyze the consequence of introducing the rate of unemployment simultaneously with employment dynamics variables and, finally (in Section 5.3), I investigate which categories of workers are more sensitive to job creation/destruction and labor reallocation.

5.1. The Effects of Employment Dynamics on Wages

The results obtained when employment dynamics variables. I present fixed effect estimates for three samples; males between 31 and 34 years old, males between 35 and 39 years old and females..... For each group, I report estimates where job creation and worker reallocation affect log wages linearly (column 1 and 2 respectively) and where they are allowed to enter the log wage equation non-linearly.

The parameters raising the most interest are those associated with job creation/destruction (χ_{jt}) and employment reallocation (ς_{jt}). As both of these variables are expressed as a ratio (percentage), the estimated coefficients admit an elasticity representation. Overall, the estimates indicate that workers employed in firms creating jobs (columns 1 and 3) receive higher wages. For males between 31 and 34, the estimates is around 1.9% while it is much higher for males between 35 and 40 (around 4.9%). In both cases, there is evidence that job creation affects log wages non-linearly. The quadratic specification implies that, for males between 31-34 and between 35-40, the effect of job creation increases with job creation. For females, the effect is significant only in the quadratic specification and is much smaller than for males.

The effect of worker reallocation (column 2 and 4) is also positive around 1% for both males and females (although much less significant than job creation) when the effect is linear. However, when non-linearities are introduced, worker reallocation will typically reduce wages at low levels of reallocation and increase wages at higher levels. However, the relatively low level of significance seem to indicate that worker reallocation is not as important as job creation.

$TABLE1A$

Estimates for Males (31–34)- Fixed Effects

(Asymptotic t-ratios in Brackets for parameter estimates)

	1	2	3	4
Exp	0.0272 (9.31)	0.0198 (7.87)	0.0276 (9.27)	0.0199 (7.93)
Exp^2	-0.0012 (12.24)	-0.0023 (3.08)	-0.0012 (12.19)	-0.0002 (0.24)
Educ	0.0276 (27.5)	0.0065 (6.12)	0.0276 (27.56)	0.0064 (1.60)
χ_{jt} .	0.0179 (1.40)	-	0.0098 (0.75)	-
$\chi_{jt}^{\ 2}$		-	0.0396 (2.35)	-
ς_{jt}	-	0.0144 (1.99)	-	-0.0128 (0.66)
ς_{jt}^2		-	-	0.0211 (1.66)
Size				
# of Ind.	1326			

$TABLE1B$

Estimates for Males (35–40) Fixed Effects

(Asymptotic t-ratios in Brackets for parameter estimates)

	1	2	3	4
Exp	0.0228 (5.45)	0.0101 (2.95)	0.0257 (5.39)	0.0235 (6.17)
Exp^2	-0.0008 (7.11)	-0.0002 (2.39)	-0.0008 (7.03)	-0.0009 (0.91)
Educ	0.0355 (23.9)	0.0333 (9.41)	0.0367 (23.96)	0.0097 (2.99)
χ_{jt}	0.0488 (2.75)		0.0396 (2.16)	-
$\chi_{jt}^{\ 2}$	-		0.0465 (2.00)	-
ς_{jt}	-	0.0087 (0.80)	-	-0.0496 (1.37)
ς_{jt}^2	-		-	0.0310 (1.51)
Size				
# of Ind	718			

$TABLE1C$

Estimates for Females-Fixed Effects

(Asymptotic t-ratios in Brackets for parameter estimates)

	1	2	3	4
Exp	0.0157 (3.71)	0.0086 (3.72)	0.0059 (2.38)	0.0154 (3.62)
Exp^2	-0.0075 (0.96)	-0.0030 (5.56)	-0.0004 (5.16)	-0.0074 (0.92)
Educ	0.0079 (1.78)	0.0274 (12.05)	0.0240 (9.88)	0.0076 (2.72)
χ_{jt}	-0.0036 (0.44)	-	-0.0023 (0.39)	-
χ_{jt}^2		-	0.0024 (0.22)	-
ς_{jt}	-	-0.0174 (1.72)	-	-0.0014 (0.76)
ς_{jt}^2		-	-	-0.0201 (0.41)
Size				
# of Ind	974			

5.2. The Effects of Job Creation and the Business Cycle

As I have argued before, the estimates of the effects of job creation/destruction and worker reallocation can be questioned if business cycles conditions (affecting both wages and job creation) are omitted from the regression. In Table 2A, 2B and 2C I have investigated the robustness of the effects of job creation and worker reallocation when the rate of unemployment is included. In Table 2D and 2E, I investigate how the effect of job creation/destruction vary over the business cycle.

5.2.1. Introducing the Business Cycle

Generally speaking, the effects of job creation/destruction on wages remain an important factor. in particular, in the case where it is allowed to be non-linear. Again, the effect of job creation is stronger for males while the effect of worker reallocation is not as precisely estimated. In all cases, there is a negative effect of the rate of unemployment on wages. Generally, the decrease in wages following a 1% increase in the rate of unemployment is between 0.5% and 1%. It is significant in all cases.

$TABLE2A$

Estimates for Males (31-34)- Fixed Effects

(Asymptotic t-ratios in Brackets for parameter estimates and pvalue for Hausman statistic)

	1	2	3	4
Exp	0.0285 (9.51)	0.0188 (7.31)	0.0188 (7.31)	0.0189 (7.34)
Exp^2	-0.0012 (12.4)	-0.0005 (0.68)	-0.0005 (0.66)	0.0005 (0.64)
Educ	0.0276 (27.6)	0.0166 (1.62)	0.0267 (1.63)	0.0096 (1.61)
χ_{jt}	0.0185 (1.74)	-	-0.0021 (0.06)	-
$\chi_{jt}{}^2$	-	-	0.0155 (1.92)	-
ς_{jt}	-	0.0125 (1.71)	-	-0.0183 (0.93)
ς_{jt}^2	-	-	-	0.0237 (1.80)
Urate	-0.0077 (2.32)	-0.0025 (1.70)	-0.0292 (1.98)	-0.0027 (1.83)
Size				
# of Ind				

$TABLE2B$

Estimates for Males35–40 Fixed Effects

(Asymptotic t-ratios in Brackets for parameter estimates and pvalue for Hausman statistic)

	1	2	3	4
Exp	0.0239 (5.67)	0.0214 (5.48)	0.0237 (5.62)	0.0213 (5.48)
Exp^2	-0.0092 (7.32)	-0.0003 (0.33)	-0.0009 (7.25)	-0.0004 (0.35)
Educ	0.0356 (24.0)	0.0064 (1.95)	0.0356 (24.0)	0.0065 (1.20)
χ_{jt}	0.0492 (2.77)	-	0.0095 (1.18)	-
$\chi_{jt}{}^2$	-	-	0.0473 (2.03)	-
ς_{jt}	-	-0.0040 (0.75)	-	-0.0615 (2.14)
ς_{jt}^2	-	-	-	0.0452 (2.15)
Urate	-0.0104 (2.20)	-0.0048 (2.22)	-0.0105 (2.23)	-0.0054 (2.46)
Size				
# of Ind				

$TABLE2C$

Estimates for Females- Effects

(Asymptotic t-ratios in Brackets for parameter estimates and pvalue for Hausman statistic)

	1	2	3	4
Exp	0.0153 (3.59)	0.0074 (3.12)	0.0732 (3.11)	0.0150 (3.52)
Exp^2	-0.0062 (0.72)	-0.0036 (4.97)	-0.0036 (4.96)	-0.0006 (0.75)
Educ	0.0078 (7.34)	0.0275 (12.0)	0.0273 (11.9)	0.0074 (1.73)
χ_{jt}	0.0002 (0.23)	-	-0.0012 (0.21)	-
$\chi_{jt}{}^2$	-	-	0.0032 (0.78)	-
ς_{jt}	-	-0.0107 (1.06)	-	0.0174 (0.88)
ς_{jt}^2	-	-	-	-0.0212 (1.23)
Urate	-0.0018 (1.70)	-0.0037 (2.51)	-0.0041 (2.88)	-0.0016 (1.97)
Size				
# of Ind				

5.2.2. The effect of Job Creation over the Business Cycle

TABLE 2D

Estimates for Males 31–34-Fixed Effects

	1	2	3	4
	Males 31-34	Males 31-34	Males 35-40	Males 35-40
χ_{jt} ·	0.0510 (0.88)		0.0400	
χ_{jt}^2	0.0161 (1.99)		0.0518 (2.20)	
χ_{jt} ∗ urate	-0.0054 (0.89)		0.0032 (0.36)	
ς_{jt}		0.0688		0.0441 (0.49)
ς_{jt}^2		0.0158		0.0440 (2.09)
ς_{jt} ∗ urate		-0.0110 (1.87)		-0.0465 (2.43)
Urate	-0.0027 (1.84)	-0.0187 (2.73)	-0.0049 (2.27)	-0.0043 (0.95)
# of Ind				

TABLE 2E

Estimates for Females 31–34-Fixed Effects

	1	2
	Females 31-34	Females 31-34
χ_{jt} ·		
χ_{jt}^2		
χ_{jt} ∗ urate		
ς_{jt}		
ς_{jt}^2		
ς_{jt} ∗ urate		
Urate		
# of Ind		

5.3. Employment Dynamics and Individual Characteristics

$TABLE3A$

Estimates for Males 31–34-Fixed Effects

	1	2	3	4
χ_{jt} .	0.0441 (0.95)		-0.0031 (0.16)	
χ_{jt}^2	0.0396 (2.34)		0.0166 (2.06)	
$\chi_{jt} *$ educ	-0.0012 (0.65)			
$\chi_{jt} *$ exp			0.0001 (0.10)	
ς_{jt}		-0.0437 (1.34)		0.0266 (0.87)
ς_{jt}^2		0.0247 (1.76)		0.0230 (1.64)
$\varsigma_{jt} *$ educ		-0.0022 (0.97)		
$\varsigma_{jt} *$ exp				-0.0027 (1.92)
Urate	-0.0078 (2.36)	-0.0027 (1.82)	-0.0042 (2.88)	-0.0026 (1.64)
Size				
# of Ind				

$TABLE3B$

Estimates for Males (35–40)-Fixed Effects

	1	2	3	4
χ_{jt} .	-0.0187 (0.28)		-0.0068 (0.22)	
χ_{jt}^2	0.0464 (1.99)		0.0063 (1.82)	
$\chi_{jt} *$ educ	-0.0004 (1.54)			
$\chi_{jt} *$ exp			0.0007 (0.46)	
ς_{jt}		-0.0005 (0.11)		-0.0032 (0.40)
ς_{jt}^2		0.0457 (2.18)		0.0447 (2.12)
$\varsigma_{jt} *$ educ		-0.0053 (1.63)		0.0017 (0.89)
$\varsigma_{jt} *$ exp				
Urate	-0.0105 (2.22)	-0.0054 (2.49)	-0.0063 (2.96)	-0.0069 (3.22)
Size				
# of Ind				

$TABLE3C$

Estimates for Females-Fixed Effects

	1	2	3	4
χ_{jt} .	0.0476 (1.03)		-0.0099 (0.50)	
χ_{jt}^2	0.0399 (2.36)		0.0187 (2.32)	
$\chi_{jt} *$ educ	-0.0034 (0.84)			
$\chi_{jt} *$ exp			0.0005 (0.41)	
ς_{jt}		-0.0435 (1.33)		0.0373 (1.25)
ς_{jt}^2		0.0222 (1.85)		0.0177 (1.82)
$\varsigma_{jt} *$ educ		0.0029 (0.99)		
$\varsigma_{jt} *$ exp				-0.0028 (2.05)
Urate	-0.0078 (2.359	-0.0016 (2.63)	-0.0039 (2.39)	-0.0038 (2.55)
Size				
# of Ind				

5.4. Model with Tenure

$TABLE4A$

Estimates for Males-Fixed Effects

	1	2	3	4
Exp				
Exp^2				
Educ				
Tenure				
χ_{jt}				
$\chi_{jt} * tenure$				
ζ_{jt}				
$\zeta_{jt}^2 * tenure$				
Urate				
Size				
# of Ind				

$TABLE4B$

Estimates for Females-Random Effects

	1	2	3	4
Exp				
Exp^2				
Educ				
Tenure				
χ_{jt}				
$\chi_{jt} * tenure$				
ζ_{jt}				
$\zeta_{jt}^2 * tenure$				
Urate				
Size				
# of Ind				

$TABLE4C$

Estimates for Females-Fixed Effects

$TABLE4D$

Estimates for Females-Random Effects

6. Conclusion

Using panel data techniques, I have investigated the empirical relationship between wages and various measures of employment reallocation used in a newly emerging macroeconomics literature. I found a positive correlation between wages paid and either net job creation or gross employment reallocation. However, estimates from simultaneous panel systems reveal that this relationship is actually a composition effect; that is workers with high level of ability (receiving more than expected given age, experience and education) tend to work in firms that have higher employment reallocation rate and higher job creation rate. This result points out the importance of labor force composition (within a given firm) in explaining firm heterogeneity as measured by an idiosyncratic growth rate. Among other things, it implies that firms with higher level of workers turnovers and higher job creation rates might have hiring policies aimed at hiring better workers and might therefore search for new employees in restricted segments of the labor market. For instance, if more dynamic firms recruit only employed workers (as opposed to those unemployed), this might explain why empirical labor economists typically find that employed job search is more effective than unemployed search (see Belzil 1996). An interesting avenue for future research is to link firm heterogeneity and search methods efficiency over the business cycle.

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APPENDIX 1

SAMPLE STATISTICS (averaged over years)

	Males	Males	Males
	35-40	30-34	New entrants
Hourly Wage			
Experience			
Age			
Education			
Tenure			
job creation (%)			
job reallocation (%)			
size			
# of periods (average)			
# of individuals			

SAMPLE STATISTICS (averaged over years)

	Females	Females	Females
	35-40	30-34	New entrants
Hourly Wage			
Experience			
Age			
Education			
Tenure			
job creation (%)			
job reallocation (%)			
size			
# of periods (average)			
# of individuals			

COMMENTS

Real Wages: Hourly wages measured in Danish Kroner per hour. Wages are measured in November of each year.

χ : averaged over all years during which the individual is employed with a given firm. Total employment in each firm is computed from the number of primary job holders in November of each year.

ς : averaged over all years during which the individual is employed with a given firm. Gross employment reallocation is defined as the number of newcomers plus number of leavers divided by firm size.

% Stayers: fraction of all workers (in a given year) who were employed with same firm as the preceding year averaged over year.

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ISSN 0908-8962

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CLS is funded by The Danish National Research Foundation