A study of Wage dispersion
The Burdett-Mortensen Model applied to:
Swedish white collar workers between 1973 and 1989

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Abstract

This essay deals with wage dispersion, the Burdett-Mortensen model is applied to a set of data collected from the year 1973 – 1989. The Burdett-Mortensen model aims to explain the reasons for wage dispersion between similar able individuals. The purpose of this essay is to test the Burdett-Mortensen model accuracy in explaining wage dispersion between similar able people, by applying it to male supervisors in Sweden between 1973 and 1989. The results of this test are mixed, meaning that no clear judgment can be done to validate or reject the accuracy of the assumptions made by the authors of this model. These results leads to the conclusion that further more expansive test of this model is required to make such a judgement.
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Section 1

Intro

Wage dispersion is a fascinating aspect of economics. A pure market economy suggests that one should get the marginal revenue of what one produces. This means that an individual’s wage is only dependent on what this individual produces, to such an extent that everyone has an individual salary that reflects what one has produced precisely. The implication is that two individuals performing the same task and producing the same amount of goods should receive the same wage. There are however no real pure market economies in the world, as a result wage setting decisions must be made by some other means. Like a common wage for all performing the same task regardless of productivity level. The wage setting decisions are so complex that it is observable that two individual having basically the same productivity level are being paid different wages. There are different theories and suggestions why this is the case, this essay will deal with one of those theories, the Burdett-Mortensen model, which tries to explain why similar people are paid different wages.

Aim

The aim of this essay is to observe the wage dispersion of Sweden’s white collar workers between 1973 and 1989 and use the Burdett-Mortensen model to explain this dispersion. In order to achieve this aim this essay has two objectives, first to examine the wage dispersion of one group of Swedish white collar workers, male supervisors. Second to credit or discredit this wage dispersion to a reasonable extent to the Burdett-Mortensen model.
Approach

This paper is divided into four sections, the first section explains the reason for choosing this topic, the aim of the essay and the means of how to achieve this aim. The second section will deal with equilibrium wage dispersion theory, namely the Burdett-Mortensen model, describe the Swedish law/system concerning job security and the wage setting policy of the time, which the data was collected from. The third section will be devoted to presenting the data collected, how it is to be processed and the results. The fourth and final section will analyse the results from the data and draw a reasonable conclusion from it and show if the aim of this essay has been achieved.
Section 2

Equilibrium wage dispersion

This theory suggests that two different wages can be observed for the same type of employment or ability. The core of this idea is that there are different types of preferences for people with the same ability. An example of this phenomenon is the cost of finding a better employment, where you have two job offers in which one pays more than the other. There is a cost of seeing both offers and no cost of seeing one offer, so those able will observe the two offers and pick the one that pays the most, while others will only see one offer at the time and accept it.¹

The previous example may be abstract, to clarify it, imagine that you are unemployed and you need a job that pays enough to sustain your regular living expenses. Each day you do not have a job is costing you future earnings since you have none, it then seems reasonable that one would take the first job that would sustain your future expected earnings. In this scenario you only observe one acceptable offer at the time, which is the offer above your ‘reservation wage’ as unemployed. However if you already have a job and receive job offers while on the job you will observe two offers, that is the wage you are already earning and the one offered. Since you already have a job your reservation wage is higher than if you had no job.²

The reservation wage is the minimum wage one would accept to take a job offer. If your reservation wage is 100 sek/h then you will only take employments that pay more or equal to 100 sek/h. However the reservation wage does not entirely depend on monetary compensation, it can also be a matter of taste, meaning how much a person likes to work or the current working situation this person has. Given an individual that likes to work or his/her work environment the reservation wage in monetary terms for set individual will be lower than for an individual that does not care for work or his/her working conditions for that particular employment.³

¹http://databas.bib.vxu.se:2642/article?id=pde2008_L000220&q=wage%20dispersion&topicid=&result_number=5
²http://databas.bib.vxu.se:2642/article?id=pde2008_L000220&q=wage%20dispersion&topicid=&result_number=5
³Labour Economics (Borjas 2008) s. 41-42
The core idea of equilibrium wage dispersion is that similar people are paid different wages.\(^4\) In order to quantify this idea Burdett and Mortensen have built a model, which I will now explain in detail. For simplicity assume that all workers and firms are identical, also that all firms contact at random a finite amount of workers, where some are employed and some are not.\(^5\)

The Burdett-Mortensen model will now be presented in two parts, first a brief mathematical part followed by a more detailed explanation of what the mathematical part represents.

\textit{Mathematical aspect}

A \((w) = \) acceptance probability, assumptions; all unemployed accept employment above a common reservation wage value denoted as \(R\). All employed accept an employment offer above the current wage

\[ A (w) = u + (1 – u) G (w) \]  
\text{(eq 1)}

Where: \(u = \) unemployment rate and \((1 – u) G (w)\) fraction of workers earning less than the offered wage

\(J (w) = \) the value for a company (employer) to hire a worker at wage = \(w\)

Where: \(w = \) offered wage, \(r = \) discount rate, \(\delta = \) job destruction rate, \(p = \) marginal productivity that the worker would yield, \(\lambda = \) rate of job offers, \((1 – F (w)) = \) probability that the offer exceeds the current wage and \(F (w) = \) distribution of the wage setting decisions of all other firms. The expression \(\lambda [1- F (w)]\) is the continuous quitting rate over time.

\[ J (w) = \frac{p – w}{r + \delta + \lambda [1- F (w)]} \]  
\text{(eq 2)}

Then the expected value of acquiring a worker dependent on the offered wage is:

\[ V (w) = A (w) \cdot J (w) = \frac{[u + (1-u) G (w)] \cdot p – w}{r + \delta + \lambda [1- F (w)]} \]  
\text{(eq 3)}

Assuming that all unemployed workers will accept all offers above \(R\) and employed workers only accept offers above their current wage, the job acceptance rate is the unemployment rate and the quit rate is the rate of job offers. Since the assumption was that all firms (employers)

\(^4\) Wage differentials, Employer size, and unemployment (Burdett & Mortensen) p. 258  
\(^5\) Wage dispersion, Why are similar people paid differently (Mortensen) p. 35
are identical there is also an upper limit of the wage a firm can offer denoted as $\bar{w}$, which yields an equilibrium distribution for $F(w)$ in order to have an equal profit condition and a max profit condition.

$$V(w) = A(w) \cdot J(w) = \left[ u + (1-u) G(w) \right] \frac{p - w}{r + \delta + \lambda [1 - F(w)]} = \frac{u(p - R)}{r + \delta + \lambda} \quad (eq \ 4)$$

Where the wage offered by all the firm is a set of offers ranging from $R$ to $\bar{w}$ and $F(\bar{w}) = 1$

The technical parts of model just explained are from three sources explaining the same model, Mortensen’s Book\(^6\), an article written by Burdett and Mortensen\(^7\) and a brief article in the database “Dictionary of Economics online”\(^8\)

**The Burdett-Mortensen model**

Equation one (eq 1) explains the probability of hiring a worker after setting a predetermined wage, it also accounts for the behaviour of an employee when receiving a job offer. In this equation $u$, (the unemployment rate) represents the probability that the targeted worker is unemployed, and $(1 - u) G(w)$ is the fraction of workers earning less than the wage offered. If the assumption that all unemployed workers will accept employment above a common reservation wage and all employed workers will accept a wage above their current. Then this equation tells us how a worker behaves when looking a job offer, when s/he is unemployed and employed.\(^9\)

Equation two (eq 2) quantifies how much a worker is worth to the employer. In simple terms the value of a worker for the firm is the difference in his/her productivity and wage earned, $p - w$ in equation two. The discount rate, job destruction rate and the continuous quitting rate are there to represent the possibility of a worker leaving employment, which employers must consider.\(^10\)

The product of the probability that a worker accepts employment (eq 1) and the value of that worker once employed (eq 2) is the expected profit per worker, which results in equation three (eq 3). This equation represents what an employer must take into consideration when setting a wage, the acceptance probability this wage will yield and how effective it will

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\(^{6}\) Wage dispersion, Why are similar people paid differently (Mortensen) p. 35-47

\(^{7}\) Wage differentials, Employer size, and unemployment (Burdett & Mortensen) p. 257-273


\(^{9}\) Wage dispersion, Why are similar people paid differently (Mortensen) p. 36-37

\(^{10}\) Wage dispersion, Why are similar people paid differently (Mortensen) p. 38
be in retaining employees when considering other firms wage setting decisions. Equation four (eq 4), represents an equilibrium, that yields a distribution of wage offers ranging from the common reservation wage \( R \) and \( \bar{w} \). This distribution of different wages is created since it is assumed that firms do not cooperate in order set a common wage. It is also assumed that the wage setting decisions are continuous, meaning that firms adapt to their situations and set different wages overtime.\(^{11}\)

Equation four represents the decision of a firm for setting a wage for hiring workers at one time. The distribution of wages already in the economy \( F(w) \) and the part of workers earning \( G(w) \) are taken as givens. The assumptions given by equation one, employed workers would only quit a job if they found an employment that paid better, and firms only set wages above or equal to \( R \) otherwise no one would accept the job offer. However equation two tells us that a worker would become unemployed if the job got destroyed which this model quantifies as the job destruction rate \( \delta \). When dealing with identical workers, unemployed workers would find employment at the job offer rate denoted as \( \lambda \). Besides dealing with identical workers another assumption in this model is that the job offer rate is the same for employed and unemployed workers.\(^{12}\)

If the employment market is working perfectly according to neo classical theory where there is no unemployment and all workers are receiving their marginal product as wage and then there would be no wage dispersion.\(^{13}\) The Burdett-Mortensen model takes this into account, in equation one the unemployment rate \( (u) \) should be approaching zero and in equation two the wage paid by the firm \( (w) \) should be approaching the employees’ marginal productivity \( (p) \) in order to have no wage dispersion. However wage dispersion is observed, it then stands to reason that this wage dispersion can be gauged, this is the objective of the Burdett-Mortensen model. Equation 4 shows an equilibrium assuming that there is wage dispersion from wages ranging from \( R \) and \( \bar{w} \), where \( R \) is the common reservation wage and \( \bar{w} \) is the highest a firm can pay without suffering losses.\(^{14}\)

The conclusion that the Burdett-Mortensen model draws is that market imperfection causes wage dispersion between similar able people. Mortensen’s book goes into deeper technical details how this holds true in a theoretical level. This is not a theoretical paper, the aim is not to determine how accurate the model’s assumptions are, but how well

\(^{11}\) Wage dispersion, Why are similar people paid differently (Mortensen) p. 39

\(^{12}\) Wage dispersion, Why are similar people paid differently (Mortensen) p. 40 – 41

\(^{13}\) Labor Economics (Borjas) p. 164

\(^{14}\) Wage dispersion, Why are similar people paid differently (Mortensen) p. 43 – 44
these assumptions can gauge wage dispersion in Sweden’s white collar workers between 1973 and 1989.

The Burdett Mortensen model explained above shows that given that the firms do not cooperate and set a common wage, there will be a distribution of wages depending on each firms’ wage setting decision, these wages will range from the common reservation wage $R$ to $\bar{w}$. If a firm sets a wage below $R$ then no one would accept their job offer and if a firm sets a wage above $\bar{w}$ then this firm will earn less or negative profit. This model allows for on job searching even when employed since it assumes that the cost of seeing a job offer is very low.\textsuperscript{15}

\textbf{Institutional reality}

It is important to keep in mind that most developed western economies have quite specific legal frameworks for their labour markets, Sweden is no exception. The collective bargaining system which Sweden used during the time the data collected is from must be mentioned in order to understand the wage dispersion or the lack of it.

Sweden has a set of labour laws, which are the standard, called LAS; these are a set of laws within the Swedish justice code.\textsuperscript{16} What is noteworthy about this set of laws is that most of them can be overruled by the collective bargain system, which Sweden uses. The employer and a union (collective) strike the bargain, in which both sides try to get the best possible condition according to their interests.\textsuperscript{17}

Sweden has a very strong history of job protection, dating back to the “saltjöbadsavtalet” in 1938, which was struck by LO and SAF, LO being the union representing the workers and SAF being the organisation representing the employers.\textsuperscript{18}

The idea of “solidarity wage policy” meaning that one should receive equal pay for equal labour was since the 1950’s until the mid 1980’s a prominent feature of these collective bargains. The result of the solidarity wage policy was an unavoidable decline in wage dispersion between workers.\textsuperscript{19}

The solidarity wage policy started out as a mean to compress wages between workers doing the same task, meaning equal pay for equal work. This objective of the solidarity wage policy setting may have had a positive effect on the Swedish economy in

\textsuperscript{15} Wage differentials, Employer size, and unemployment (Burdett & Mortensen) p. 258 – 264
\textsuperscript{16} http://www.notisum.se/rnp/sis/lag/19820080.HTM
\textsuperscript{17} http://www.personalekonomi.se/kollektivavtal.htm
\textsuperscript{18} http://www.foretagsamheten.se/Historisk-oversikt/1930-talet/Saltsjobadsavtalet/
directing the wages to a market clearing level. Meaning that workers may have had a wage
closer to the marginal product than before the policy was in effect. However this stage of the
solidarity wage policy started in the 1950’s and ended at the end of 1960’s\(^{20}\)

The solidarity wage policy at the end of the 1960’s changed from “equal pay for
equal work” to “equal pay for all work” This lead to a wage compression not only between
type of employment but also across them. This took place in an aggressive manner from
around 1969 up to 1983. By 1983 the organisation representing the Swedish employers (SAF)
had had enough and the strong centralized bargaining was over. Even though the practise of
“solidarity wage policy” was in practise abandoned in 1983 it remained an objective by the
workers union up to 1990. The actual details on how this came about are more complex but
for the scope of this essay, it is not needed to go into deeper than to recognise that from 1973
to 1982 wage were being compressed and from 1983 to 1989 (and onward) dispersed.\(^{21}\)

The institutional inertia that LAS provides is the job protection aspect of it,
mainly the “last in, first out” part of it. The “last in, first out” concept means that the one who
was last employed is the first to get fired if a company needs to downsize. This means that a
company is usually “stuck” with the employees that they have. It also implies that seniority
gives a strong protection from being fired, furthermore this also result in great caution
exercised by an employer when taking on a new employee. Even though there are reasons that
one can be fired from, there have to be extremely severe in order to hold up in the Swedish
labour court.\(^{22}\)

As mentioned earlier that LAS can be overruled by collective bargaining, the
result of this is that the “last in, first out” principle is not blindly followed. If you have two
workers, one with higher seniority than the other, and one has to downsize. Where the one
with lower seniority is the only one that can perform not only his task but also the one of the
other with higher seniority. While the one with higher seniority only can perform his own
tasks and not the ones of the other, then it is permitted to fire (downsize) the one with higher
seniority. If both task are needed to run the firm in an efficient manner\(^{23}\)

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\(^{19}\) How Wage Compression Affects Job Turnover (Heyman) p. 14
\(^{20}\) Wage Dispersion and Productive Efficiency: Evidence for Sweden p. 758 – 761
\(^{21}\) Wage Dispersion and Productive Efficiency: Evidence for Sweden p. 762 – 765
Section 3

Methodology

Equation one presented in section 2 shows a relationship between the unemployment rate and wage dispersion. A high unemployment rate yields a high probability of hiring a worker at the wage set by a firm. This implies that a high unemployment rate increases wage dispersion. Since firms have more unemployed workers to choose from, and this workers are back to just observing one wage offer at a time and thus the distribution of wages becomes more dispersed. The assumption that workers only change jobs when they are offered a higher wage than the one they have would also increase the wage dispersion when unemployment goes up. Since those who lost their jobs go back to observing one acceptable wage offer and those who have jobs accept only higher offers increase the gap between wages.

It stands to reason then that if the assumptions that the Burdett-Mortensen model makes are true that the wage increase from those who change jobs is greater than for those who stay, so if one change job according to the Burdett-Mortensen model one should have a higher wage than someone that does not change employment.

The data which this paper deals with is from a relative exiting economic period in Sweden’s history. It contains samples from a period when the wages in Sweden where by institutional means being compressed, disregarding to an extent occupation with the attitude “equal pay for all work”. The data also deals with a period from 1983 and onward, in this period the highly centralized collective bargaining system broke down and wages became more dispersed.

The reason for not breaking up the data into a before/after section is to test the Burdett-Mortensen model. If the model’s assumptions are accurate in describing reality, the relations describe by it, should still hold true over time even if a labour market is relatively regulated. Although there is “the solidarity wage policy” and the existence of a strong history of union bargaining, Sweden still belongs to the liberal market category, especially when comparing it to the planned economies that were around in eastern Europe during the second half of the 20th century.

The wages observed are figures describing the wage dispersion of white collar workers in Sweden between 1973 and 1989. The figures this paper will be dealing with are from the most homogenous group available in the data collected, male supervisors. The
decision to choose the most homogenous group was taken with consideration to the main
timey of the paper. The Burdett-Mortensen model assumes a completely homogenous group,
by choosing the most homogenous group it will be easier to validate or discredit the Burdett-
Mortensen model to a reasonable extent as a mean to analyse wage dispersion.

The data will be divided into four groups, ranging from group ‘A’ to group ‘D’:
Group A are Males 35 years or younger in the lower quartile of wage level. Group B are
Males 36 years or older belonging to lower quartile of wage level. Group C are Males 35
years or younger belonging to upper quartile of wage level. Group D are 36 years or older
belonging to upper quartile of wage level.

This is not optimal data for using the Burdett-Mortensen model, the group could
have of been made even more homogenous. By for instance dividing it into education level,
more precise working experience level than just age. A set of individual data would have been
more insightful in order to test the Burdett-Mortensen model. However the data available was
only broken down into the groups as previously described and in form of an accumulative
average of the wage in Swedish crowns for each year ranging from 1973 to 1989.24

**Data presentation, Selection and processing**

The data being used is an accumulative data set describing the average wage
from one year to the next of male supervisors. This data is divided into two age brackets, 35
years or younger and 36 years or older. It also separates the lower quartile and higher quartile
in terms of salary received. Furthermore the data divides the groups into those who stay at the
same job and those who change job. The data set is also divided into lower and higher
quartile, summing up the wage changes disregarding the age division described above. As
mentioned earlier the data set follows all male supervisors’ wage development in Sweden
from 1973 to 1989.25

The Burdett-Mortensen model is designed to follow individual job search
behaviour, in order to test the model one has to follow a set of relatively homogenous
individuals. Track the tests subjects’ employment and wage history and observe if there is a
notable wage dispersion caused by those who leave their employment and those who remain
in the same employment.26

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24 supplied from svenska arbetsgivareföreningen(SAF) by karl-olof faxen
25 supplied from svenska arbetsgivareföreningen(SAF) by karl-olof faxen
26 An Empirical Equilibrium Search Model of the Labour Market, (Van den Ber & Ridder) p.1193
The data this paper deals with is not ideal for testing the Burdett-Mortensen model, it is however adequate in order to determine whether the prediction made by this model is accurate to a certain extent. The information described is not enough to test the Burdett-Mortensen model to a reasonable extent. It would be enough to determine if on average the wage increase is higher or lower for those who leave a job compared to those who stay. The Burdett-Mortensen model also describes a relationship between the unemployment rate and wage dispersion. If there is a higher wage increase for those who change job and if the wage dispersion increase when the unemployment rate goes up (or decrease when it goes down) would give the assumptions made by the Burdett-Mortensen model more weight.

In order to accomplish this, the regression:

\[ Y = \beta_0 + \beta_1 + \beta_2 + \epsilon_i \]

will be applied, where the dependent variable \( Y \) will be the wage for job changers, \( \beta_1 \) will be the wage for job stayers and \( \beta_2 \) will be the unemployment rate. The objective of this regression will be to observe the wage development and to be able to analyse if there is a relation between the wage development of job stayers, job changers and the unemployment rate. In addition to the previous objective it will also determine, if a relations exist between these variables, if it is the relation that the Burdett-Mortensen model predicts. The wage development will be observed from the changes of wage from year to year and the unemployment rate will be what it was the year the wages are observed, where unemployment is defined by the “Statistiska centralbyrån” standard.\(^{27}\)

### Result

This part of section 3, will present the regression results for the four groups the data analysed has been divided into. The tool for running the regression was microsoft excel software, the 2007 edition. The regression that was being done was:

\[ Y_t = \beta_0 + \beta_1 \text{ Wage Job stayer}_t + \beta_2 \text{ unemployment rate}_t + \epsilon_i \]

Where the dependent variable \( Y \) was the wage for job changers. Since microsoft excel was used to analyse the data, the results are going to be presented as shown in the software. The

R2 value for a regression done in excel, shows how much the regression can explain the changes in the dependent variable.

The R2 value is a number between or equal to one and zero, the higher the R2 value the more can be explained by the regression model, for instance an R2 value of 0.78 would suggest that the regression model can account for 78% of the variance of the dependent variable when accounting for the all the independent variables. The significance F value determines whether there is a real relationship between the dependent and independent variable(s) in the regression, the lower the significant F value the more likely that there is a real relationship between the variables analysed. If the significance F value is 0.05 it would translate to that there is a 5% chance that the relationship observed is caused by coincidence. A significance F value of 0.05 or lower is considered to be acceptable for accepting a relation between the variables examined, a value of 0.10 – 0.05 is considered marginal for accepting a relationship between the variables examined.

The coefficient tells whether there is a positive or a negative relationship between a specific independent variable and the dependent one. For instance $\beta_1 = 0.5$ means that one unit increase in $\beta_1$ would increase the dependent variable’s value by 0.5. This kind of interpretation of relationship between two variables in a multiple regression is only acceptable if the other variables are held constant. To be able to judge if there is any correlation, the coefficient should be twice as large (or larger) as the corresponding standard error before any correlation can be assumed. The T-statistic is the standard error divided by the coefficient value for each input. Therefore, a T-statistic greater than two is an indication of strong correlation. The P-value, tells us the same as the significance F value, however every P-value is attached to each independent variable. The lower the P-value, the greater the correlation, a value of 0.05 or less is an indication of a strong correlation, a value of 0.10 – 0.05 is an indication of a marginal correlation.

The last two paragraphs have been a compilation of the three first chapters of Anderson, Jorner and Ågren’s book “Regressions- och tidsserieanalys”.

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28 Regressions- och tidsserieanalys (Andersson, Jorner & Ågren) p. 13 – 136
Group A, males 35 years or younger lower quartile

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<th>Standard Error</th>
<th>t Stat</th>
<th>P-value</th>
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<td>$\beta_0$</td>
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<td>38,72</td>
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<tr>
<td>$\beta_1$</td>
<td>1,063</td>
<td>0,41</td>
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<td>$\beta_2$</td>
<td>1,14</td>
<td>0,55715</td>
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The R2 value for this regression was 0,37642 and the significance F value is 0,036664

Table 1

Table one shows a low R2 value and a low significance F value. Meaning that the regression can only account for 37,6 % variance of the dependent variable, there is however a relationship between the variables analysed. This result shows that the regression used may have had shortcoming for accounting for the change in the dependent value when only considering the unemployment rate and the wage level for job stayers. Nevertheless when examining the independent variables a clear correlation exist between the wage for job stayers and job changers, and a marginal correlation between the unemployment rate and the wage for job changers.

The variable $\beta_1$ (wage job stayers) shows a value of 1,063, which means that for one unit added the value of this independent variable, the dependent variable (wage job changers) change with 1,063. This implies that the wage increase is higher for job changers than for job stayers in group A over time.

The variable $\beta_2$ (unemployment rate) shows a positive relationship, the P-value of the variable shows however a marginal correlation.

Group B, males 36 years or older lower quartile

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<td>$\beta_2$</td>
<td>-0,37</td>
<td>0,69</td>
<td>-0,53</td>
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The R2 value for this regression was 0,347431 and the significance F value is 0,050395

Table 2

Table two shows a low R2 value and a significance F value is barely above 0.05 so this result shows a marginal relationship between the variables examined. Once again the regression model constructed shows shortcoming. In this case the only independent variable that shows a significant relationship is $\beta_1$.

The $\beta_1$ variable (wage job stayers) has a value of 1,95, this implies that for one unit increased in the wage for job stayers, the wage for job changers increase by 1,95. This group also shows a higher wage increase for job changers than for job stayers over time.
The P-value of $\beta_0$ and $\beta_2$ is far too high to make any reasonable claims to the correlation of them and the dependent variable.

<table>
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<th>t Stat</th>
<th>P-value</th>
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</thead>
<tbody>
<tr>
<td>$\beta_0$</td>
<td>-42.79</td>
<td>34.43</td>
<td>-1.24</td>
<td>0.23</td>
</tr>
<tr>
<td>$\beta_1$</td>
<td>1.39</td>
<td>0.31</td>
<td>4.44</td>
<td>0.00056</td>
</tr>
<tr>
<td>$\beta_2$</td>
<td>0.59</td>
<td>0.55</td>
<td>1.083</td>
<td>0.30</td>
</tr>
</tbody>
</table>

The R2 value for this regression was 0.584772 and the significance F value is 0.002128

*Table 3*

The R2 value for group C is relatively high when compared to the other groups, and the significance F value is very low relative to the other groups. However only the $\beta_1$ variable shows significant correlation. The value of the $\beta_1$ is 1.39, like the previous groups it indicates that the wage increase is higher for job changers than for job stayers.

<table>
<thead>
<tr>
<th>Group D, males 36 years or older upper quartile</th>
<th>Coefficients</th>
<th>Standard Error</th>
<th>t Stat</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta_0$</td>
<td>53.39</td>
<td>32.10</td>
<td>1.67</td>
<td>0.12</td>
</tr>
<tr>
<td>$\beta_1$</td>
<td>0.53</td>
<td>0.29</td>
<td>1.82</td>
<td>0.091</td>
</tr>
<tr>
<td>$\beta_2$</td>
<td>0.041</td>
<td>0.66</td>
<td>0.061</td>
<td>0.95</td>
</tr>
</tbody>
</table>

The R2 value for this regression was 0.192281 and the significance F value is 0.224297

*Table 4*

The R2 value is low and the significance F value is high, this indicates that there is no relation for the variables examined in the regression for this group. The P-value for the $\beta_1$ is within the margin for determining a correlation, however the t-stat value is below two so there is no evidence for a relationship between the variables examined for this group.
Section 4

Discussion

The results shown in the previous section were mixed. The outcome for groups A, B and C indicated that there is a positive relationship between the wage development for job changers and job stayers. This is in accordance with the assumption made by the Burdett-Mortensen model since the wage increase for job changers was greater than for job stayers. In group A there was also a positive relationship between the unemployment rate and the wage development for job changers. Even though evidence was found to support the claims made by the Burdett-Mortensen model there was evidence in the data that showed no correlation between the variables analysed. This can be interpreted in such a manner that one can claim that in those cases, which showed no correlation the assumptions made by the Burdett-Mortensen model are not entirely accurate.

To jump to such a conclusion would be a mistake, the lack of clearer result may be a systematic data flaw. Although the data examined variables used in the Burdett-Mortensen model, they were not as precise as the authors of this model suggest they should be. The group selected was not as homogenous as they could have been expected them to be. Meaning that a group was chosen that had the same occupational title (supervisors), however beyond this title, the data examined did not separate them into educational level, task/skill level required by their specific employment or into levels of tenure within the firm.

The data was an average of the salary earned by the four different groups the data was divided into. The optimal data would have been an individual data set of supervisors, following their employment and wage development history through the years 1973 – 1989. The unemployment rate used was the one calculated for the whole Swedish economy, a more precise unemployment rate concerning only male supervisors would perhaps have been more appropriate.

The economic period from which the data was collected from may also have had an influence on the mixed result. As suggested in section 2 (institutional reality) if the Burdett-Mortensen model is accurate in its assumptions, the economic turmoil that may occur should not influence the basic assumptions, like that the wage increase for job changers is greater than job stayers.
The LAS regulation suggest that there should be inertia when hiring and dismissing employees, even if the law can be circumvented specially when it comes to high skilled labour, which may include high skilled supervisors in some cases. It is important not to ignore its potential impact. An impact that LAS could have had in this case is that the wage development of the job changers would have been significantly higher than of the job stayers. The “last in, first out” principle would have made the decision to change job not only a monetary matter, but also a job security matter, making the wage increase for changing job higher, than if there was no such principle. There was evidence in the result for a higher wage increase for job changers in group A, B and C, this confirms the predictions made by the Burdett-Mortensen model. However these results can be a consequence of the Swedish job protection system and not the model used. Alas the data did not include the individual job contracts of the supervisors so its impact cannot be quantified within the scope of this essay.

The solidarity wage policy which was being implemented during the period should have given unclear results in the data analysed. The first objective of the solidarity wage policy was “equal pay, for equal work”, which pushed the wages to the market clearing level. However the objective of this policy changed for “equal pay, for all work” during a large period from when the data collected was from. After 1983 the wages became more dispersed due to the abandonment of this policy. This was an important part of the test that this essay put the Burdett-Mortensen model through. From 1973 until 1982 the wages were set by institutional means disregarding economic reality for ideological reasons, which implies that the wages would have not followed any conventional market forces and were to a great extent arbitrarily set.

The result of this strategy of wage setting would of have been that there would be no correlation between the variables examined since other, non-market forces were setting wages. The adjustment that may have occurred after the solidarity wage policy was abandoned may have had lag. Thus influencing individual decision about staying or changing employment in a manner not intended if one follows the reasoning of the Burdett-Mortensen model. If the assumption about how individuals behave according to the Burdett-Mortensen model are accurate none of this would have matter, and firms and individuals would of behaved to the best of their ability in agreement to what is predicted regarding job changing and wage setting (wage setting 1983 and onward).

The fact that the data analysed yielded some positive results suggest that further testing of the model is required.
Conclusion

The aim of the essay was to observe wage dispersion and to use to Burdett-Mortensen model to explain it. The scope of this essay covered two aspects of the Burdett-Mortensen model, the unemployment rate and the difference in wage development of job stayers and job changers. The first aspect, was that a higher unemployment rate would lead to higher wage dispersion, which group A showed evidence for. The second aspect, was that a higher development of wage level of job changers relative to job stayers would be observed, which would lead to higher wage dispersion. Group A, B and C showed evidence for the last mentioned aspect.

The discussion segment of section four suggests that the Burdett-Mortensen model should be further examined with more appropriate data. Even with this suggestion in mind the data yielded results in favour of the Burdett-Mortensen model. If these result are enough to credit the Burdett-Mortensen model for explaining wage dispersion to a reasonable extent is doubtful. The doubt comes from that no result was entirely positive. All groups had mixed results, so one cannot claim from the results that the Burdett-Mortensen model applies for instance to male supervisors 35 years or younger.

In order to achieve this certainty the regression model and the data collected must be expanded to include more variables (like the ones suggested in the discussion segment of section 4) in order to determine whether the positive results from group A, B and C show a more accurate picture of reality or if the results from group D are the dominating ones. If one achieves a clearer picture of reality discrediting the Burdett-Mortensen model for analysing the Swedish wage dispersion a further step would be to theorise about other explanations to the wage dispersion observed. If the results support the Burdett-Mortensen model then an expansion beyond just a single homogenous group would be the next natural step. A large survey, statistically representing the entire population of a country and follow them over several years.
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