Duration of educated unemployment

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Article Info	Abstract
	The study aims to describe the characteristics of unemployed workers in Central Java Province and to determine the model of educated unemployment duration. It uses the linear regression model of 1721 workforces that are sampled from National Labor Survey 2015. The model regress the unemployment duration on age, sex, education level, income during unemployment period and GRDP of the industrial, service and agricultural sectors. **Findings and Originality**: The results show that variables of age, sex, the income of job seekers, education level at junior and senior high school level and GRDP in the agricultural sector have a positive effect on the unemployment duration. The variables of the status of household head, the high school education level, as well as the GRDP service sector, negatively effect the unemployment duration. Thus, it is recommended for the Central Java province government to develop service sectors to shorten the duration of unemployment in Central Java Province.

Introduction

Central Java Province has the economic potential to be developed. There are 29 districts and 6 municipalities, divided into three large area groups, namely: North Coastal Regions, the Central Region, and Southern Coastal Regions. Each region has different characteristics and potential. The potential includes the agricultural, industrial, services, trade and other sectors.

In the period 2010 – 2011 the Province of Central Java economic grew about 6.03 percent. On the other hand, in the same period, there was a decline in the unemployment rate from 4.38 percent to 4.19 percent or just 0.19 percent. The number of educated unemployed people increased by 0.27 percent. It shows that a fairly high economic growth was not followed by a decrease in the unemployment rate at the same speed level. A slow decline in the unemployment rate shows that in the job market, unemployed workers' behavior allegedly showed a tendency to not immediately willing to accept a job offer. It means that unemployed workers willing to wait longer to look for finding a more suitable job to achieve the expectations of their employment wage (McCall, 1970). The level of wage may be related to the characteristics of the unemployed workers that are the level of education, age, and sex (Burdett, 1978; Fitzgerald, 1998; McCall, 1970; Stigler, 1962). This phenomenon is thought to be in accordance with the description of unemployed workers who are in the process of finding employment according to the search theory approach.

The percentage of unemployed workers in 2013 in Central Java, according to education level, gender and age each of 74.3 percent for educated job seekers, 25.7 percent for uneducated job seekers, 68.5 percent for men and 31.5 percent are women. The percentage for groups <20 years old was 34.3 percent, those aged 20-30 years were 36.1 percent and those aged > 30 years were 29.6 percent. Concerning these characteristics, it appears that individual male job seekers,

more educated and younger, may experience a longer period of seeking employment than women. This is in accordance with what was alleged by the search theory.

The composition according to the percentage absorbed in the sectors of Agriculture, Industry, Trade and other services is 33.78; 19.14; 12.92; 21.38 and 12.78 percent, respectively. It shows that in the province of Central Java the Agricultural sector still dominates employment (Statistics Indonesia, 2006, 2011). It may relate to gross regional domestic products contributed by the Agricultural sector to the total Gross Regional Domestic Product. The situation may affect lower market wages in the agricultural sector. Therefore, this sector absorbs a lot of low educated workers. This is in accordance with the characteristics of the workforce in Central Java Province which generally have low education where about 53.27 percent have a maximum education graduated from elementary school (Statistics Indonesia, 2006, 2011).

Observations on the behavior of workers who have not been accepted to work and are still unemployment are conducted using the theory of labor supply which explains the individual's decision to work or enjoy leisure time. Individual decisions to increase or decrease working hours or leisure time are influenced by wage rates and non-work income (Layard and Walters, 1978). Supply theory is developed into a search theory. It explains that individual unemployed workers can decide to work or not work, taking into account the expected wage or wage reservation set. Expectation wages may be directly proportional to the increase in consumption costs, which means that the higher the cost of consumption, the higher the wages set by individual expectations. Conversely, the wage expectation may be inversely proportional to the additional time needed to get a job (Julien, 2007).

The composition of the workforce working in each sector is thought to be a result of the compatibility between the prevailing market wages in the sector and the wages of labor expectations. This means that wage expectation influences individual decisions to work (McCall, 1970). The agricultural sector is the largest sector providing employment opportunities, followed by the trade sector, service industry, and others. The agricultural sector is much interesting for uneducated unemployed workers while the industrial, service and trade sectors are sectors that are requested by educated job seekers. It means that education affects the duration of seeking employment. The study of the determinants of unemployment duration in Ukraine found that education and gender had a significant effect on the duration of time to look for a job while age did not have a significant effect (Stetsenko, 2003). The level of well-being and the existence of unemployment insurance and the business cycle may have an impact on unemployment which means affecting the duration of time seeking a job (Andolfatto, 2006). The Age, gender and unemployment insurance affect the duration to look for a job (Kristiansen, 2011).

Based on the background, it can be stated that the behavior of job seekers, in association with old job search, empirically may be influenced by variables of level of education, age, gender, as internal factors and GRDP of Industrial sector, GRDP Services and agricultural GRDP as an individual external factors that replace the role of the market wage. The research generally aims to build a model that can be used to determine the duration of unemployment for educated workers by using the search theory on the labor market of Central Java. Specifically, its objectives are to describe the characteristics of unemployed workers in Central Java Province; to estimate the influence of individual characteristics of education level, age, gender, status as head of household, unemployed workers income and GRDP in the industrial sector, agricultural sector GRDP and GRDP services sector on unemployment duration; and to build a model of unemployment duration to estimate the time needed by educated unemployed workers to look for a job.

Understanding the reservation wage or salary expectations is part of the determination of unemployment theory or known as search approach to formulating the unemployment model. It was originally developed in the form of a non-sequential job search for unemployed workers who do not follow a particular sequence. Unemployed workers must first determine the number of

samples that they want to find employment. The number of samples is becoming a benchmark for the duration of the process of job search. Thus, the duration of a person unemployed is equal to the duration of time used in the search process. After some samples of the unemployed workers are met then compare and choose the best offer for him (Stigler, 1976). In contrast, a sequential development model is a model for unemployment by unemployed workers who follow a series of the regular search process. Unemployed workers may first determine a benchmark for the end of the process of unemployment or a stopping rule (McCall, 1970).

With those assumptions, workers may find a job in the labor market that is not perfectly good information regarding the qualifications required and the level of the wages offered. Each worker must pay a certain amount of cost for seeking employment in the form of all expenditures and lost opportunities. Workers have the criteria to accept or reject a job based on the level of minimum wages in accordance with expectations (reservation wage). Unemployed workers may maximize the expected net income and the reservation wage as a criterion to accept or reject a job. Furthermore, unemployed workers may end the process of unemployment when the extra cost (marginal cost) of an additional one job offer the same in return (marginal returns) of the job offer (McCall, 1970).

Individuals have different expectations for wage reservations. The diversity is caused by the characteristic background of the individual. The characteristics inherent in the individual possibly become the basis for determining the high and low wages that are desired. The higher an unemployed worker in determining wage reservations, the less likely it is to accept job offers. If other things are considered permanent (ceteris paribus), and this means that the period of unemployment is getting longer and vice versa. Another view that reveals the search theory approach used to understand unemployment that developed in the 1980s-1990s focuses on the decision of an unemployed worker to accept a job offered or continue to look for better jobs (Fitzgerald, 1998).

The model developed will explain the mechanism of the unemployment process of a worker, thus, it ends by accepting the desired job. The model will begin with the view that individual unemployed workers may receive income for life which will be assessed now. Therefore, there will be a balance condition in the unemployment process that the income during unemployment must equal to income when receiving a job. It is mathematically conveyed as follows:

$$\text{Ws} = \text{Wa} \tag{1}$$

$$\text{Ws} = \text{Wu} - \text{C} + \beta\,(1-\alpha)\,\text{E Wo} \tag{2}$$

$$\text{Wa} = \frac{\text{Wr} + \beta\alpha E\ \text{Wo}}{(1-\beta(1-\alpha))} \tag{3}$$

Which means described in the algebraic mechanism as follows:

$$\text{Wu} - \text{C} + \beta\,(1-\alpha)\,\text{E Wo} = \frac{\text{Wr} + \beta\alpha\text{E Wo}}{(1-\beta(1-\alpha))}\text{Wo} = \text{Wr} + \beta\alpha\text{E Wo} \tag{4}$$

$$(1-\beta(1-\alpha))\,(\text{Wu} - \text{C} + \beta(1-\alpha)\,\text{E Wo}) = \text{Wr} + \beta\alpha\text{E Wo} \tag{5}$$

$$\text{Wr} + \beta\alpha\text{EWo} = (1-\beta(1-\alpha)\text{Wu} - (1-\beta(1-\alpha)\text{C} + (1-\beta(1-\alpha)\beta.\,(1-\alpha)\text{E.Wo} \tag{6}$$

$$\text{Wr} = (1-\beta(1-\alpha)\text{Wu} - (1-\beta(1-\alpha)\text{C} + (1-\beta(1-\alpha)\beta(1-\alpha)\text{E.Wo} - \beta\alpha\text{E Wo} \tag{7}$$

$$\text{Wr} = (1-\beta(1-\alpha))\,\text{Wu} - (1-\beta(1-\alpha))\,\text{C} + (1-\beta(1-\alpha))(\beta\text{E. Wo} - \beta\alpha\,\text{E Wo}) - \beta\alpha\text{E Wo}. \tag{8}$$

$$\text{if } \Phi = (1-\beta(1-\alpha)) \tag{9}$$

thus:

$$Wr = \Phi\ (Wu - C + \beta\ E\ Wo - \beta\alpha\ E\ Wo) - \beta\alpha E\ Wo \tag{10}$$

$$Wr = \Phi Wu - \Phi C + \Phi\ \beta\ E\ Wo - \Phi\ \beta\alpha\ E\ Wo - \beta\alpha E\ Wo \tag{11}$$

$$Wr = \Phi Wu - \Phi C + \Phi\ \beta\ E\ Wo - \beta\alpha\ E\ Wo\ (\Phi - 1) \tag{12}$$

$$Wr = \Phi\ (Wu - C + \beta\ E\ Wo) - (\Phi - 1)\ \beta\alpha\ E\ Wo \tag{13}$$

$$Wr = \Phi(Wu - C + \beta E Wo) - (\ (1-\beta(1-\alpha)) - 1)\beta\alpha.E.Wo \tag{14}$$

$$Wr = \Phi\ (Wu - C + \beta\ E\ Wo) - (-\ \beta(1 - \alpha).\ \beta\alpha\ E\ Wo \tag{15}$$

If $\Theta = \beta(1 - \alpha)$ $\tag{16}$

thus:

$$Wr = \Phi\ (Wu - C + \beta\ E\ Wo) - (-\ \Theta)\ \beta\alpha\ E\ Wo \tag{17}$$

$$Wr = \Phi\ (Wu - C + \beta\ E\ Wo) + \Theta\ (\beta\alpha\ E\ Wo) \tag{18}$$

The duration to accept a wage offer, called the job acceptance level or the level of acceptance, is only the same as a fraction of the offer greater than or equal to Wr. P is the notation of the level of employment acceptance. Because the distribution of uniform wage bids, P is calculated as

$$P = \frac{Wk - Wr}{Wk - Wm} \tag{19}$$

Time = Wages according to individual characteristics
Wr = Expected wages
Wm = Market wages
A workforce in the labor market always faces some job offers with some wages assumed to be normally distributed. Thus it can also be assumed that the wages offered today are market wages that occurred in the previous period, thus, Wm = Wo then:

$$P = \frac{Wk - Wr}{Wk - Wo} \tag{20}$$

$$P = \frac{Wk - \Phi(Wu - C + \beta E\ Wo) + \Theta(\beta\alpha E\ Wo)}{Wk - Wo} \tag{21}$$

If returned Wo = Wm

$$P = \frac{Wk - \Phi(Wu - C + \beta E\ Wm) + \Theta(\beta\alpha E\ Wm)}{Wk - Wm} \tag{22}$$

The duration of unemployment is influenced by wages that match the characteristics of individual job seekers, non-market wages received by unemployed workers while looking for a job, the cost of finding a job, expectations of wages offered and individual market wages of job seekers. Characteristic wages are ideal wages that must be received by individuals in accordance with certain characteristics perceived by job seekers. It means that the characteristic wage range with the expected wages reflects individual characteristics perceived by job seekers. These characteristics include the level of education, gender, and age inherent in individual job seekers. Market wages are wages that apply in the labor market.

Feinberg (1978) established structural equations to test the basic idea of search theory put forward McCall. Feinberg found that the variables included in the search theory explain most of the variation of wages or reservation wage expectations. Kiefer and Neumann (1979) formulate a

model that allows for the reservation wage (WR) and labor supply function F(W), to vary according to the duration of getting a job. Fallon (1983), formulates an unemployment model by incorporating elements of income in the informal and traditional sectors. Montgomery and Sulak (1989) used a model of Neuman Kiefer in explaining the process of finding a partner for a family in Indonesia, Malaysia, and Korea. It was found that the education of the female partner influences the reservation wage.

Moeis (1992) with the 1987 Sakernas data analyzed educated unemployment. It was found that senior high school graduates were longer unemployed than junior high school graduates. Suratman (1994) examines how the influence of an individual's social demographic characteristics on the duration of seeking employment and the behavior of workers in the Kalimantan region. It found that the higher education of unemployed workers may experience a longer duration of seeking employment and simultaneously, the duration of unemployed workers in the period of looking for work is also getting longer. Setyadi (1996) with the 1992 Sakernas data also found that higher education may have a longer duration in the period of looking for a job. While educated unemployed workers may need a shorter period of seeking employment in the service sector. Education and gender have a significant effect on the duration of seeking a job, while, age has no significant effect (Stetsenko, 2003). Education, age, experience, household size, number of children and household income affect the duration of seeking a job (Pellizzari, 2006). The level of prosperity and the existence of unemployment insurance and the business cycle may have an impact on unemployment which means that it affects the duration to find a job (Andolfatto, 2006). The theory of job search depicts that there is a relationship between individual characteristics and individual external situation with unemployment duration. The education, age, gender status as head of household, income job seekers, agriculture, industrial and service GRDP sectors may influence the search duration of the job.

Methods

This research is survey research that relies on primary data available at the Central Bureau of Statistics, namely the 2015 National Labor Force Survey (Sakernas) data with a sample of 49,360 workers and subsequently selected to be 1721 workforce. Empirical formulation process carried out with the following steps:

$$\text{Dur} = \frac{(\Phi\,(Wu-C+\beta E\,Wm)+\theta\,(\beta\alpha EWm)) - Wm}{Wk - (\Phi\,(Wu-C+\beta E\,Wm)+\theta\,(\beta\alpha EWm))} \tag{23}$$

thus, $\text{Dur} = f(Wk, Wu, Wm)$

Wk = f (education, age, gender)

Wu = wages during unemployment (it is ignored because in the absence of unemployment insurance)

Wm = Market wages, namely wages that apply in the market during the survey

Wm then became proxy of the GRDP of the industrial, agricultural and service sectors.

Then, the proposed model is in the form of the following formulations:

$$Dur = \beta0+\beta1U+\beta2Jk+\beta3Skrt+\beta4Wu+\beta5Educ1+\beta6Educ2+\beta7Educ3+\beta8GRDPi$$
$$+\beta9GRDPp+\beta10GRDPj+\mu \tag{24}$$

Educ 1 = education of respondents graduating from junior high schools

Educ 2 = education of respondents graduating from senior high school

Educ 3 = education of respondents graduating from secondary and tertiary education

U = Age of respondents

GRDPi = industrial GRDP, in million rupiah

GRDPp = agricultural GRDP in million rupiah
GRDPj = service GRDP, in million rupiah

Based on the model, it can estimate the duration to look for a job in that period. However, before the model is used, first, a test of the influence of the level of education, age, gender and market wages on the unemployment duration, with the following hypothesis: (1) The level of education, age, gender and GRDP in the industrial, agricultural and service sectors have a significant influence on the duration seeking a job both partially and simultaneously; (2) The level of education is expected to have a positive significant influence on the search duration of job; (3) Age allegedly has negative significant influence on the search duration of job; (4) Male unemployed workers are expected to have shorter duration of seeking a job; (5) Unemployed workers who are in an area with a higher GRDP of industrial sector have positive significant influence on the search duration of job; (6) Unemployed workers who are in an area with a higher GRDP services have positive significant influence on the search duration of job; and (7) Unemployed workers who are in an area with higher agricultural GRDP may have longer duration to get a job.

Results and Discussion

The summary statistic of Age, GRDP, wages, duration of unemployment is described in Table 1.

Table 1. Descriptive Statistics

	N	Minimum	maximum	mean	Std. deviation
Age	1721	15	65	27	11
Agri_GRDP	1721	1,012,548	20,968,789	5,167,120	4,755,089
GRDP_Srvcs	1721	3,309,292	100,305,934	19,397,766	20,693,044
Inds_GRDP	1721	2,284,277	47,304,926	11,659,850	10,725,168
wage	1721	-	13,000,000	196,627	537,475
length of working	1721	0	119	12	16
Valid N (listwise)	1721				

The minimum age of respondents was 15 years old and the oldest was 65. The average age of respondents was 27.4073 years. In terms of duration of unemployment period, the longest is 119 months and the shortest is 0 months with the average duration of employment for unemployed workers in Central Java takes 12 months. Several unemployed workers have income along looking for a job, the lowest is Rp 0 and the highest is Rp 13,000,000 with an average rupiah is at 196,627.06 Rupiah.

Another situation that was observed was minimum and maximum values and the average of the GRDP per district both from the agricultural sector, as well as industrial and services showed the respective minimum value of 1,012,548.00, 3,309,292.00 and 2,284,277.00. While the maximum value of each sector was 20,968,789.00 premised the average size of each was 5,167,120.3992, 19,397,766.4027 and 11 659 850.2876.

Considering the above situation, the services sector has a great chance to be the choice of unemployed workers in finding a job in the future. It was indicated by respondents who earn revenue during their job search. It means that unemployed workers may last for a job because not only search for employment, but also to work while searching for a job.

The relationship between heads of household status with unemployment duration is depicted in Table 2.

Table 2. Characteristics of Respondents according to the unemployment
duration with the status as head of household

		Head of household		Total
		Not Head house Stairs	Head of household	
<5 mths	Count	640	164	804
	% of Total	37.20%	9.50%	46.70%
5-9 mths	Count	182	33	215
	% of Total	10.60%	1.90%	12.50%
10-14 mths	Count	243	35	278
	% of Total	14.10%	2.00%	16.20%
15-19 mths	Count	91	17	108
	% of Total	5.30%	1.00%	6.30%
> = 20 mths	Count	254	62	316
	% of Total	14.80%	3.60%	18.40%
Total	Count	1410	311	1721
	% of Total	81.90%	18.10%	100.00%

There is a tendency that the heads of household status have a shorter duration for searching
for a job. The relationship between the sexes with unemployment duration is described in Table 3.

Table 3. Characteristics of Respondents by sex with Unemployment Duration

		Job search duration					Total
		<5 mths	5-9 mths	10-14 mths	15-19 mths	> = 20 mths	
woman	Count	255	66	92	36	87	536
	% of Total	14.80%	3.80%	5.30%	2.10%	5.10%	31.10%
Man	Count	549	149	186	72	229	1185
	% of Total	31.90%	8.70%	10.80%	4.20%	13.30%	68.90%
Total	Count	804	215	278	108	316	1721
	% of Total	46.70%	12.50%	16.20%	6.30%	18.40%	100.00%

There is a tendency of men workers to have a longer duration to get a job. The relationship
between age group with job finding duration is depicted in Table 4.

Table 4. Characteristics of Respondents According to the
Unemployment Duration with Age Group

		Age Group				Total
		less equal to 20	21-30	31-40	> 40	
<5 mths	Count	327	233	113	131	804
	% of Total	19.00%	13.50%	6.60%	7.60%	46.70%
5-9 mths	Count	62	89	39	25	215
	% of Total	3.60%	5.20%	2.30%	1.50%	12.50%
10-14 mths	Count	98	98	45	37	278
	% of Total	5.70%	5.70%	2.60%	2.10%	16.20%
15-19 mths	Count	35	44	16	13	108
	% of Total	2.00%	2.60%	0.90%	0.80%	6.30%
> = 20 mths	Count	62	132	64	58	316
	% of Total	3.60%	7.70%	3.70%	3.40%	18.40%
Total	Count	584	596	277	264	1721
	% of Total	33.90%	34.60%	16.10%	15.30%	100.00%

The relationship between education and Unemployment Duration is described in Table 5.

Table 5. Characteristics of Respondents According to
the Unemployment Duration with the Education Category

		Unemployment Duration					Total
		<5 mths	5-9 mths	10-14 mths	15-19 mths	> = 20 mths	
<= Elementary School	Count	187	44	50	21	74	376
	% of Total	10.90%	2.60%	2.90%	1.20%	4.30%	21.80%
Junior High School	Count	145	35	65	26	78	349
	% of Total	8.40%	2.00%	3.80%	1.50%	4.50%	20.30%
Senior High School	Count	405	102	121	49	108	785
	% of Total	23.50%	5.90%	7.00%	2.80%	6.30%	45.60%
Higher Education	Count	67	34	42	12	56	211
	% of Total	3.90%	2.00%	2.40%	0.70%	3.30%	12.30%
Total	Count	804	215	278	108	316	1721
	% of Total	46.70%	12.50%	16.20%	6.30%	18.40%	100.00%

Regression analysis was performed to determine the significant influence of Age, Gender, status as head of household, income during the search for employment, education level i.e. junior, senior, secondary and tertiary education level; the Industrial GRDP, service GRDP and agricultural GRDP on unemployment duration both partially and simultaneously. The regression results that all independent variables on unemployment duration are simultaneously significant.

Table 6. Regression Coefficients

Model	Coefficients unstandardized		t	Sig.
	B	Std. Error		
(Constant)	1,079.00	1,850.00	0.58	0.56
Age	0.31	0.05	6,080.00	0.00
Sex	2,370.00	0.87	2,741.00	0.01
Head of household	-5,145.00	1,384.00	-3,719.00	0.00
wage	0.00	0.00	1,441.00	0.15
educ1	4,682.00	1,224.00	3,826.00	0.00
educ2	-0.06	1,077.00	-0.06	0.96
educ3	6,524.00	1,421.00	4,590.00	0.00
Services_ GRDP	-6.90E-08	0	-2673.00	0.01
Agriculture_GRDP	2.27E-07	0	2018.00	0.04

Table 6 depicts the effect of each independent variable on job search duration. The Age, gender, income during a seeking job, higher education and agricultural GRDP sectors variable has a positive significant influence on job search duration. Meanwhile, the status as head of the household variable, high school education and service GRDP sector have a negative significant influence on the search duration of the job.

A positive influence implies that if the respondent increases his age, the job search period is longer. The male respondents are in the search for a job longer. As the head of the household, they usually spend a shorter time in the search for a job. The respondent earning income during the job search will have a longer period in the search for a job. The junior high school and higher education are longer in the search for a job that those of high school education.

The respondents who reside in an area where the GRDP in the service sector rise will be shorter in the period of looking for a job and the respondents who are in the area with an increasing GRDP in the agricultural sector will be longer in the period of looking for a job. The Industrial sector has been represented by the service sector, thus, it does not appear in the model.

Table 7. Duration of educated job

Variables	Household Head			Not Household Head		
	Educ1	Educ2	Educ3	Educ1	Educ2	Educ3
constants	5.76	10.16	7.60	5.76	10.16	7.60
AGE	6.06	1.32	7.91	6.06	1.32	7.91
JK	8.43	3.69	10.28	8.43	3.69	10.28
SKRT	3.29	-1.45	5.13	8.43	3.69	10.28
Wage	3.29	-1.45	5.13	8.43	3.69	10.28
Services_GRDP	3.29	-1.45	5.13	8.43	3.69	10.28
Agriculture_GRDP	3.29	-1.45	5.13	8.43	3.69	10.28

The Table 7 shows that higher education tends to have a longer duration in finding a job. Job seekers who live in areas with services GRDP will be shorter in this time of job search than those were living in areas with the agricultural sector. Besides, the job seekers with the head of the household status are likely to have shorter job search duration.

Conclusion

The age, gender, Income during the search for employment, junior level of education, higher level of education and agricultural sector GRDP variables have a positive and significant influence on the duration of job search. On the other hand, services sector GRDP, Senior High School level of education and status as head of household have a negative and significant influence on job search duration. This finding is consistent with that described by the Search Theory especially if the observed influence of educational level on the duration of the job search that shows that the higher the education the longer duration to get a job. It may that they have higher reservation wage. These findings are aligned with the previous researches (Andolfatto, 2006; Bieszk-Stolorz & Markowicz, 2014; Setyadi, 2015).

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