

The Duration of Unemployment in Sub-Saharan Africa: Study Using Microeconomic Data from the Republic of Congo

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Abstract

This article aims to analyze the factors explaining the duration of unemployment in Congo. To do so, we opted for a logit model with a limited dependent variable. Using data from a survey conducted by the Laboratoire de recherches et d'études économiques et sociales du Congo (LARES) in partnership with the International Development Research Centre (IDRC) in 2018), we show that the duration of unemployment in Congo is explained in part by job search intensity. This finding has implications for economic policy. Moreover, this result can be further developed in the future by conducting an analysis of the gender determinants of unemployment duration.

Keywords : Unemployment duration, Logit, Congo

JEL classification : J64, C35, O55.

Introduction

The search for an internal balance is undoubtedly one of the objectives that every nation aspires to achieve through, among other things, multiple strategies and policies to combat unemployment. According to the International Labour Organization (ILO, 2018), unemployment affects 5.5% of people in developed countries and 5.3% in developing countries. Its magnitude in the latter seems to highlight the weakness of the policies implemented in these countries. In Sub-Saharan African countries ILO forecasts reveal a rate of 7.3% in 2019.

Like almost all countries in Sub-Saharan Africa, Congo faces a demographic situation marked by high unemployment rates and long periods of unemployment, particularly among young people. Indeed, according to the ILO (2016), the unemployment rate for young people between 15 and 29 years of age amounts to 30.5% and this rate is higher in urban areas (39.0%) than in rural areas. (11.07%). In addition, a significant proportion of unemployed youth (31.0%) have been unemployed for at least 2 years.

In response to this situation, public authorities have developed and implemented programs such as the Graduate Employment Program (PED) in 2004, the Rural Employment Development Support Program (PADER) in 2009 and, with the support of the World Bank, the Skills Development Program for Youth Employability (PDCE) in 2018. However, these programs have not helped to improve the employment situation in Congo. Indeed, statistics from survey on improving employment policies (EAPE-C) conducted in 2018 reveal that the average duration of unemployment is 2 years 8 months and 12 days. In other words, there was no progress in reducing the duration of unemployment between 2016 and 2018. Thus, it appears that the unemployment duration in Congo is a real problem for which explanatory factors should be sought.

Beyond these observations, the economic literature reveals that there is a large theoretical and empirical corpus on the duration of unemployment. On the theoretical level, particularly from a microeconomic point of view, there is a consensus on the validity of the job search model. On the empirical level, there are several microeconomic factors of unemployment duration (level of education, marital status, age, etc.). Note that these factors may vary from one country to another, depending either on the realities of labor markets or on the econometric models used.

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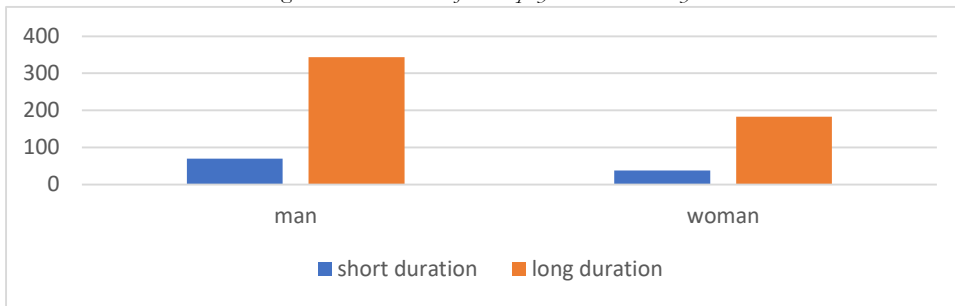
In contrast to the work carried out to date, particularly in developing countries, on the duration of unemployment (Tansel and Taşçı (2004), Dendir (2006), etc.), this work proposes an analysis of the determinants of the duration of unemployment in Congo using a logit model with a limited dependent variable. It should be noted that this study is a pioneering work in the Congo, since there is no currently empirical work on the duration of unemployment in Congo. The question guiding this research is the following: What factors explain the probability of remaining unemployed for six months or more? Therefore, the objective of this paper is to analyze the determinants of the probability of remaining unemployed for at least six months.

In addition to the introduction and conclusion, this work is organized around the following three points: (1) a description of the duration of unemployment, (2) a review of the literature, (3) the methodological framework, and (4) interpretation and discussion of the results.

Description of unemployment duration

The persistence of unemployment is one of the most recent subjects which many authors in developed countries (Marek et al (2015), Lee and Choi (2016), ...) and developing countries (Serneels (2001), Kherfi (2015), ...) are interested. According to the OECD (1988), it is a major concern for public authorities (around the world); because in the labor market, long-term unemployed individuals have a low probability of being hired compared to short-term unemployed individuals. This probability depends to characteristics of unemployed individuals and their position in the labor market, Bourdet and Persson (1991). The graphs below give us an overview of the distribution of unemployment duration base on some characteristics of unemployed Congolese individuals.

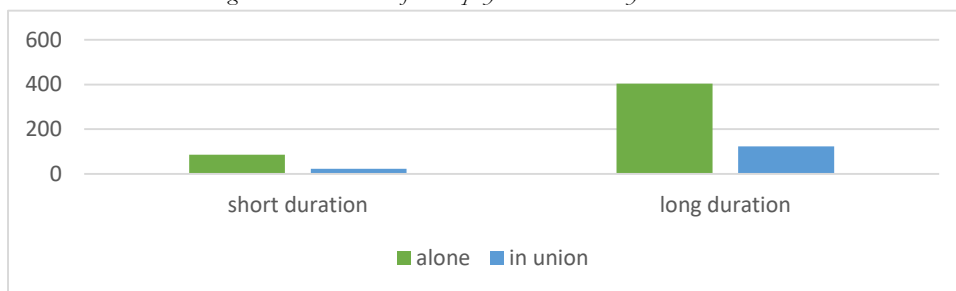
Figure 1: Distribution of Unemployment Duration by Gender



Source: author using data from E.APE-C, 2018.

The graph shows that regardless of gender, there are more individuals facing long periods of unemployment. Moreover, the number of men affected by this unemployment is significantly higher than that of women. This trend is also valid for the short term.

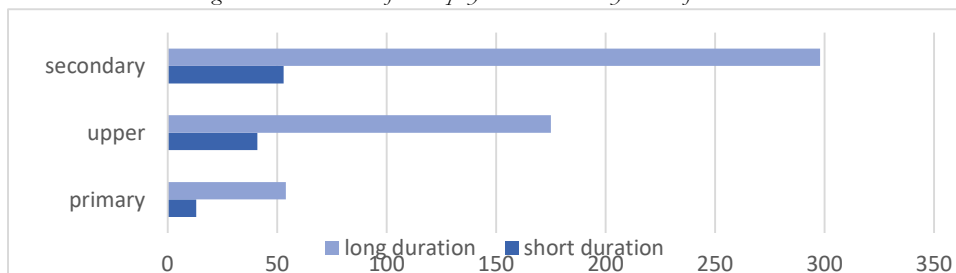
Figure 2: Distribution of Unemployment Duration by Marital Status



Source: author using data from E.APE-C, 2018.

This figure that for both durations of unemployment, the number of single individuals is higher than that of their married counterparts. Moreover, we must note that our working sample is dominated by individuals who have been unemployed for six months or more.

Figure 3: Distribution of Unemployment Duration by Level of Education



Source: author using data from E.APE-C, 2018.

Overall, we note that people who have been unemployed for six months or more are in the majority in all three levels of education selected for this research. Moreover, as one moves from a lower level to a higher level, it appears that the number of unemployed people in the "long-term" category increases.



Source: author using data from EAPE-C, 2018.

These two graphs show that our working sample is composed largely of young people. In fact, their numbers reach 81% and 95% in the case of the short and long term. In the case of long-term unemployment, the gap between the two groups of individuals amounts to 90%. On the other hand, in the short-term unemployment, the gap is 62%. This means that the gap between the two duration is 28%.

2. Literature review

The duration of unemployment is a phenomenon that has been the subject of several studies in labor economics. According to Algan et al. (2006) and Fremigacci (2010), there is an abundant literature on the determinants of this phenomenon and this issue is one of the most studied in economics. In this section, we present some theoretical and empirical elements that serve as tools for analyzing unemployment duration.

2.1 Unemployment duration : a theoretical perspective

The duration of unemployment is a topical issue that integrates various theoretical developments. According to Bonnal and Fougère (1990), it is a subject that intersects with various topics and that can be found in various theoretical works. Among these works, we can cite those that are commonly used, namely: job search models, matching models, and labor market segmentation.

In terms of job search models, they owe their development to the work of Mortensen and McCall (1970). They are based on the assumption that job seekers have imperfect information about job vacancies in the labor market. Thus, they explain unemployment duration essentially through two mechanisms. First, by estimating their own market value, unemployed individuals remain job seekers as long as they do not obtain a job that corresponds to their wage expectation. Second, since employment is less attractive, they reduce their search effort, which reduces their chances of obtaining a job offer. In addition, these models assume that unemployed individuals have a threshold for accepting a job offer, called the reservation wage, denoted by w^* . According to Bontemps (2004), this wage corresponds to the opportunity cost of searching plus the discounted expectation of future income. It continues to exist and is unique. Thus, job seekers continue to turn the market when the wage offered to them is less than w^* .

Regarding matching models, it is worth emphasizing that they emanate from the job search models, and conform to Keynesian principal, in the sense that they shed light on the duration of unemployment by taking a macroeconomic approach. In these models, exit from unemployment is a function not only of the individual behaviors of job providers, but also of that of job seekers (Pissarides, 1990). Moreover, they are based on the hypothesis that the job search exercise corresponds to an economic activity in its own right. Therefore, it can be represented by a production function similar to all other productive processes. Moreover, inflows into unemployment are exogenous and outflows are captured by the matching process, which corresponds to a process of sharing between firms and unemployed individuals. Note that this process is characterized by a matching function that indicates the number of successful employer/employee combinations as a function of the number of job vacancies and the number of job seekers. This function is increasing in its two arguments: the number of unemployed in the economy and the indicator of labor market tightness (ratio of total job vacancies to total unemployment). Therefore, unemployment can only be the result of imperfections in the matching mechanism. Nevertheless, the nature of these models seems different from the models that fit our study.

Finally, for proponents of the theory of labor market segmentation (Doeringer and Piore (1971)), the labor market has several strata. Moreover, moving from one segment to another poses challenges. Based on its dualistic form, labor market segmentation refers to an opposition between two sectors:

The primary sector where employees benefit from better working conditions, good career prospects, etc. and a secondary sector where employees do not benefit from any social protection, and have essentially low wages. Under these conditions, the duration of unemployment can be analyzed either by means of one or the other of these sectors, or jointly across the two. For this purpose, the use of job-search models is one option among many. Moreover, this is the perspective of Salop's (1979) work, which provides a robust theoretical explanation of the relationship between involuntary unemployment and labor market segmentation.

2.2 Duration of unemployment : an empirical perspective

To explain the duration of time spent unemployed based on the individual characteristics of unemployed persons, several empirical works have been devoted to estimating of the determinants of unemployment duration. With regard to the different type of investigation carried out by such work, two groups of works can be identified. On the one hand, there is a group of studies dealing with European countries (to which South Korea is added), and on the other hand, there is a the group of studies dealing with non-European countries.

Regarding the first group, we begin by highlighting the work performed by Kupets (2006). Indeed, this author presents the first proof of the determinants of the duration of unemployment in Ukraine between 1997 and 2003. To do so, he uses individual data from the first wave of the Ukrainian Longitudinal Survey, the Surveillance Survey (ULMS -2003). Taking into account the problem of heterogeneity in the estimation of a continuous time proportional Cox model, his results indicate no significant effect of unemployment benefit but a negative and significant effect of income from casual activities, subsistence agriculture, household income, or pension on employment risk.

In the same vein, we can cite Marek and al. (2015). They obtained arrived the result that the individual's social capital has a positive influence on his or her probability of being employed in a firm in the near future. This result stems from an ongoing analysis based on a Cox mode using data from the German Socio-Economic Panel (SOEP).

Similar to previous authors, Lee and Choi (2016) focused on estimating the determinants of unemployment duration, in Korea using the survey dataset of the Korean Labor and Income Panel (KLIPS). Their empirical analyses show that the duration of unemployment increases when the samples are women, older, less educated, etc. In addition, they find that the duration of unemployment increases in parallel with the level of perceived life satisfaction. This result implies the importance of psychological (personal) factors in explaining the average duration of unemployment in Korea.

For the second group, we begin by citing Foley (1997). Using data from the Russian Longitudinal Monitoring Survey (RLMS) and a discrete-time waiting model with increased competitive risks, this author finds the following results: married women experience much longer unemployment individuals than their male counterparts. Older people remain unemployed longer than younger people. Compared to the unemployed who have only secondary or primary education, those with higher levels of education experience a long spell of unemployment. All other things being equal people in areas of high unemployment, move to areas of unemployment.

Serneels (2001) analyzes the duration of unemployment in Ethiopia. In his article, he observes that the average duration of unemployment is very long, approximately four years. Additionally, after estimating a duration model, he finds that age has a significant negative effect, as expected, while education has a positive effect. People whose fathers work in the public sector are more likely to be unemployed than those whose fathers work in the private sector.

Tansel and Tasci (2004) conducted the first study on the duration of unemployment in Turkey. Applying parametric and nonparametric methods to household labor force survey data from 2000 and 2001, they obtain results that indicating that women experience longer unemployment durations than men. Age has a negative effect on the hazard rate, while education has a positive effect. The effect of the local unemployment rate is large and negative. The duration dependence of the unemployment exit rate is different for men and women. There is a slight U-shaped duration dependence for men, while there is no duration dependence for women.

More recently, Kherfi (2015) used 2006 and 2012 data from the Egyptian Labor Market Panel Survey (ELMPS) to examine the pattern of transition from unemployment to employment base on to several individual and environmental criteria. By estimating a discrete duration hazard model, he finds that the duration of unemployment is longer among women and those with higher levels of unemployment. Being married favors longer unemployment durations. Compared to older youth, adolescents remain unemployed for shorter periods of time. Unemployed people with educated parents are more likely to experience a shorter duration of unemployment.

This review shows that there are several determinants of unemployment duration and that duration models seem to be the most widely used in this type of research. However, because of the nature of the data available, we will not use such models in this article, despite their popularity.

Methodology

The duration of unemployment is a phenomenon that arouses interest among many authors ; and that can be understood through several models. To test the existence of a relationship between this phenomenon and certain variables from the literature review (available in the database), we construct a logit model. The choice of this model is justified in part by the methodological demarcation that we wish to make with respect to most of the work dealing with this subject, in this case in developing countries (Serneels (2001), Kherfi (2015), ...). That is, are mainly interested in duration models, and we only want to analyze the probability of remaining unemployed for six months or more, not less. Such an analysis can be conducted by constructing, for example, a variable with two modalities: 1=being unemployed for six months or more and 0=being unemployed for less than six months. The tabulation of the duration of unemployment variable reveals that its values start at one to six months or more. Moreover, for Dănașciă and Mazilescu (2014), this concept refers to the state of a person who has been unemployed for six months/12 months or more.

3.1 Theoretical basis, specification and estimation method

3.1.1. Theoretical foundations

In the universe of econometric models, the logit model is qualitative choice models. Generally, these models have their origin in utility theory.

Let K be a rational individual who faces several possible alternatives. If we note by C_n the set of choices that n individuals can make at a given instant and by U_{hk} their utility from alternative h , we obtain the following utility function with arguments: $U_{hk} = U(V_{hk})$. Under these conditions, this individual will choose the alternative that will give him or her the highest utility, for example g if $U_{gk} > U_{jk}$ where $g \neq j$ and $g, j \in C_n$. However, it is difficult to know exactly which alternative the individual will choose because of the probabilistic characteristics that integrate the choice decision. On the other hand, we can know the probability that the individual will choose any alternative. Indeed, it is assumed that the individual always ranks these alternatives in order of preference. Consequently, the probability that k chooses option h can be written as follows: $P_g = P_g(U_g > U_j, j \neq h)$. Moreover, preferences are random. Therefore, the two-part decomposition of the random utility function of an option can be written as follows: $U_{gk} = V_{gk} + \omega$ where ω denotes the random part of the utility. Thus, the probability P_{hk} that h is chosen with respect to another alternative is either. Since the determination of qualitative choice models requires a specification for the systematic component V_{gk} and a functional form for the utility function, the linear function on the parameters a of vector w is often used as follows : $V_{gk} = a_1X_1 + a_2X_2 + a_3X_3 + \dots + a_nX_n$, with X_1, X_2, \dots, X_n of the observed data.

3.1.2 Specification

Consider a sample of N indexed youths $i=1 \dots N$. For each of them, we check whether the event of remaining unemployed for six months or more is realized. Let I_i be the associated coded variable and I_i^* be the selection variable, which represents being unemployed for six months or more. Thus the chance that an individual will be a former unemployed person is $\forall i \in [1, N]$, and we have the following :

Note that $I_i^* = \delta Z_i + \epsilon_i$, where :

Z_i : the set of variables that determine the probability of being unemployed

δ : all the parameters

ϵ_i : the set of perturbations supposed to be independently distributed

Under these conditions, the log likelihood associated with the sample of size N , denoted $L = (I_1, \dots, I_N)$, can be written as follows :

where $F(\cdot)$ designates the distribution function of the logistic law. Finally, the logit model estimated can thus be written as follows :

3.1.3 Estimation method

In estimating qualitative choice models, the most commonly used method is the method Likelihood Maximum (ML). Taking into account the characteristics of the sample described above and the binary variable I , the likelihood function corresponding to this method can be written as follows : Furthermore, the ML principle consists of finding the value of δ that maximizes LN , i.e. the output of the derivative of LN with respect to the parameters.

3.2 Data source, study variables, and descriptive statistics

3.2.1 Data source

In this work, the data used are taken from a survey on improving employment policies conducted by the IDRC and LARES in 2018. Our working sample consists of 2,152 people belonging to the departments of Brazzaville and Pointe-Noire.

3.2.2 Study variables

The various variables that we selected for this work are unemployment duration, job-search intensity, gender, marital status, age, and high school education.

Duration is the variable explained in the model for estimation purposes below, and it has two modalities: 0=less than six months of unemployment and 1=six months or more of unemployment.

Marital status is a binary variable with two modalities: 0=single and 1=in a union. In relation to the monetary and other requirements of living as a couple, we anticipate, as Kherfi (2015) did, a negative relationship between the duration of unemployment and the fact of being in a union.

Age, used by Tansel and Tasci (2004), is a quantitative variable. It corresponds to the number of years of an individual's existence. Intuitively, we believe that the older the individuals is the less incentive he or she has to look for work, which may therefore keep him or her unemployed for a long time.

Gender is a variable that has two modalities, namely, 1=female and 0=male. With reference to the work of Lee and Choi (2016), we predict a negative relationship between being female and the duration of unemployment.

A high level of education is a variable that serves as a proxy for human capital. To see whether education is a factor in explaining unemployment duration, we recoded this variable into three modalities: (1) primary, (2) secondary, and (3) tertiary. According to human capital theory, it is expected that youth with secondary and higher levels of education may be more likely to remain unemployed for a longer period of time than their counterparts with only primary education.

Job search intensity is the amount of job search activity that an individual engages in to search for a job. It is a quantitative variable, with values (which can be described as scores) ranging from 0 to 110, and we constructed this variable assuming that the total number of job applications, interviews, civil service entrance exams, and so on reflects the job search effort made by the job seeker. Note that this approach is consistent with that taken by Gautier et al. (2007).

3.2.3 Descriptive statistics

The table below presents the numbers and percentages associated with the terms of our explained and explanatory variables.

Table 1: Descriptive Statistics

Variables	Number	Pourcentage
Duration		
<i>Less than six months</i>	108	17.01
<i>Six months or more</i>	527	82.99
Gender		
<i>Female</i>	1,404	34.76
<i>Male</i>	748	65.24
Marital status		
<i>Single</i>	1,565	72.72
<i>In a union</i>	587	27.28
High level of education		
<i>Primary</i>	225	10.49
<i>Secondary</i>	897	41.84
<i>Tertiary</i>	1,022	47.67
Age	Mean : 27	Min : 15 Max : 43
Job search intensity	Mean : 34	Min : 0 Max : 110

Source: author based on data from E.APE-C, 2018

According to the table above, our working sample is largely composed of people who have been unemployed for six months or more. Indeed, their workforce represents 82.99% of the total workforce. Looking at the gender variable, we note that men (65.24%) outnumber women (34.76%).

In addition, more than half of the individuals do not live as a couple. The proportion of people who are in a union is barely 27.28%. Similarly, the majority of unemployed individuals had the highest level of education, secondary school (41.84%) or higher (47.67%).

Overall, the age of unemployed individuals is between 15 and 43 years old, and on average, they are 27 years old. Moreover, it should be noted that the values of the job search intensity score range from 0 to 110 and that the average score is 34.

Interpretations and discussion of the results

The logit model estimation results are shown in the table below:

Table 2: Outcomes and Marginal Effects of the Estimated Logit Model

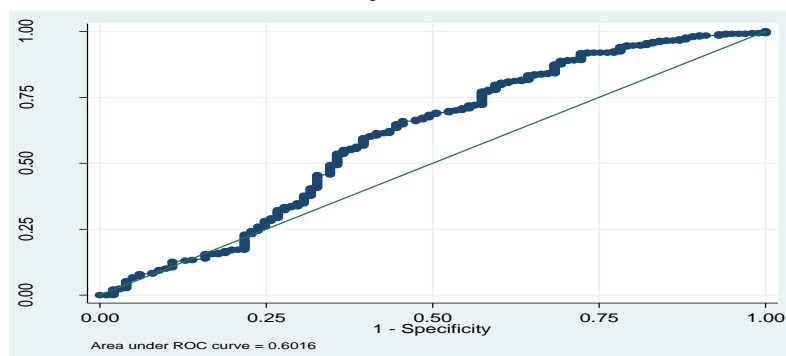
Variables	Coef	P> z 	dy/dx	P> z
Gender				
<i>Female</i>	-0,006	0.979	-0.0008	0.979
<i>Male</i>	<i>ref</i>			
Marital status				
<i>Single</i>	<i>ref</i>			
<i>In a union</i>	0.028	0.921	0.003	0.920
High level of education				
<i>Primary</i>	<i>ref</i>			
<i>Secondary</i>	-0.139	0.712	-0.019	0.716
<i>Tertiary</i>	0.204	0.573	0.028	0.576
Job search intensity	-0.024	0.000*	-0.0034	0.000*
Age	-0.0014	0.956	-0.00021	0.956
C	1.765	0.028*		
Statistics on the overall quality of the model				
<i>Number of iterations = 4</i>				
<i>Log likelihood = -257.74</i>				
<i>LR $\chi^2(6) = 18,95$</i>				
<i>Prob > $\chi^2 = 0,0043$</i>				
<i>Pseudo R² = 0,035</i>				

**significant at the 1% threshold*

Source: author based on data from EAPE-C, 2018

The table above presents the logit model estimation results. It shows that the convergence was rapid since the results were obtained after the fourth iteration. The likelihood (-257.74) is very high in absolute value, and the log likelihood (18.95) is significant at the 1% level. These different indicators that provide information on the quality of the estimated model can be complemented by the ROC graph below:

Graph 5: ROC



Source: Author, based on data from EAPE-C, 2018.

Reading this graph, we observe superior discrimination. Indeed, we see that the curve deviates from the bisector. Overall, the estimated model has good properties and can therefore be interpreted.

Overall, the results obtained after estimating the logit model allow us to draw one main conclusion: job search effort is a factor that is conducive to exit from unemployment.

Job Search Effort: A Factor Paving the Way Out of Unemployment.

Focusing on Table 2, this result can be seen in the coefficient on the job search intensity variable since it is negative and significant at the one percent level. Thus, there is a negative relationship between unemployment duration and job search intensity. In other words, all other things being equal, an increase in the amount of job search effort leads to a reduction in unemployment duration. Moreover, looking at the marginal effects, we can argue that increased job search effort increases the chances of exiting unemployment by 0.34 percent.

With respect to the literature, this result complements the nonexhaustive list of empirical evidence that currently exists on the relationship between variations in job seekers' search intensity and unemployment duration. By way of illustration, it is consistent with the main conclusions reached by van den Berg and van Ours (1996), Jones (1988), and Machin and Manning (1999), among others.

In the Congolese environment, this is true, for example, when job seekers are trying to obtain positions with large firms such as Total, Eni, Slog Chevron, etc., in the sense that these firms attract a large number of job applicants because of the high salaries they offer. Under these conditions, increased competition may result. In the face of this situation, the individuals who would multiply the number of applications in the competitions opened by these structures would undoubtedly increase their chances of exiting long-term unemployment.

In addition to the previous point, we can highlight the opacity of the labor market. Indeed, the Congolese market has recorded multiple and, to say the least, contrasting evolutions since the end of the 2000s. In fact, despite the stabilization of the unemployment rate at approximately 11% in Congo, particularly since 2009, new concerns have emerged in the world of employment in Congo, namely, low job creation, underemployment and, more recently, the dissolution of the ONEMO (national employment office). As a result of these difficulties, vacancies are becoming scarce, and employment prospects are very poor. Under these conditions, it seems obvious that it is by being motivated to devote more effort to the job search process that unemployed individuals can maximize their chances of finding a job that may or may not match their profile.

In light of the work performed by Blau and Robins (1990) and Boheim and Taylor (2001), who found that the number of years of education increases the job search intensity, this result implies that to avoid eroding their returns to education, unemployed workers who are highly educated are more likely to be motivated to put more effort into the job search process. A summary of the results of the survey conducted by LARES and CERDI in 2018, contained in the table below, shows the breakdown of job search score classes by educational level.

Table 3: Distribution of Job Search Score Classes by Education Level

Level	Class	[0-30]	[31-60]	[70-110]
Primary		210	6	3
Secondary		870	3	4
Tertiary		941	19	6

Source: Author, based on data from EAPE-C, 2018.

Overall, the table shows that regardless of the score class, more unemployed people have the highest level of unemployment. Their numbers are 941, 19, and 6 for the classes [0-30], [31-60], and [70-110], respectively. With the exception of [31-60], it appears that the number of unemployed individuals increases when moving from a lower to a higher level of education. In sum, we conclude that more educated unemployed individuals are more motivated to seek employment than those with less education.

Conclusion

Congo is one of the countries on the African continent whose economy is largely based on the hydrocarbon sector. With the collapse of the price of oil beginning in 2014, its economy is paying the price for its low resilience. This is not without consequences for the labor market since the recent statistics from the EAPE-C (2018) reveal that the unemployment rates in the two most populated cities (Brazzaville and Pointe-Noire) of the country are clearly high compared to their level in 2012 (with reference to the EESIC survey).

Apart from unemployment in the strict sense, Congo is also confronted with the situation of people who have been unemployed for a year or more. Due to the persistence of this phenomenon, despite the active

employment policies that have been implemented, it seemed interesting to us to compare the factors that explain this phenomenon between unemployed individuals who have benefited from employment programs and those who have not.

The results obtained by estimating a logit model with a limited dependent variable revealed that the duration of unemployment in Congo is partly explained by the job search intensity. This result confirms basic job search theory and implies that the government should put in place mechanisms to make unemployed individuals more enterprising in the labor market. To enrich the existing literature on the persistence of unemployment in Congo, analysis of the determinants of unemployment duration, taking into account gender, may constitute a path for future research.

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