PROLONGATION OF UNEMPLOYMENT DURATION AMONG GRADUATES IN MOROCCO:
A Hypothetical Expectation of Suitable Job Opportunity

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ABSTRACT

This study investigated the socio-economic determinants of unemployment duration among young graduates. Utilizing structural equation models, we examined data collected from a survey conducted among young graduates registered with the national agency for employment and training in Morocco. Our findings indicate that, besides the individual characteristics of the graduates, holding a higher-level degree extends the duration of unemployment in the Moroccan labour market. However, the results also suggest that the slower exit from unemployment among higher-educated graduates can be attributed to their behaviours and job search strategies. Engaging in various job search activities, notably utilizing personal and professional networks or making spontaneous job applications, significantly increases the likelihood of swiftly escaping unemployment. Our conclusions underscore the importance of policies aimed at improving the alignment between supply and demand in the labour market, as well as promoting proactive job search practices among graduates.

JEL classification: E24, J64

1. Introduction

In Morocco, young graduates mainly have experienced a degradation in their employment prospects and are facing increasing difficulties in entering the job market, resulting in significantly higher unemployment rates (15.7% for graduates

compared to 3.1% for non-graduates) (HCP, 2019). Unemployment thus exhibits an inverse relationship with the level of education among job seekers. As one advances in educational attainment, the chances of securing employment diminish (El Aoufi & Hanchane, 2016).

The issue is not merely that young graduates experience periods of unemployment but rather that this situation persists, eroding the existing stock of human capital in the economy and potentially leading to severe social and psychological consequences for the graduates.

These figures suggest that the relationship between education and employment is not straightforward, and there are other factors, apart from education, that need to be considered when analysing the professional integration of young graduates.

This observation leads us to question why these young graduates are unable to secure employment, even with their qualifications that should facilitate their integration. Are they active participants in their integration process, with their efforts, skills, job search strategies, and networking playing a role, or are they constrained by their social and geographical background, gender, and specific educational trajectories? Does having a diploma influence their job search capabilities?

Such questioning prompts us to investigate the determinants of young graduates' integration into the Moroccan labour market. Specifically, this study seeks to answer the following research questions: What are the factors that hinder graduates from quickly exiting unemployment?

Based on these considerations, our work aims to study the microeconomic determinants of unemployment duration. To achieve this, we employ the survival analysis method within the framework of structural equation modelling. The use of duration models is preferred for modelling duration variables, especially unemployment duration, due to its connection to the theory of sequential job search.

In the following sections, we first present the theoretical and empirical framework of our study. Then, we introduce the model and the adopted methodology, followed by a discussion of the empirical results.

2. Theoretical and Empirical Literature Review

2.1 Theoretical framework of unemployment

Duration researchers prefer the job search theory to study this period of job search (Vincens, 1981). According to this theory, the search for a suitable job justifies the existence of unemployment duration among graduates.

Given that the labour market is characterized by imperfect information, job seekers do not have complete information about available jobs, remuneration, and other associated elements. Therefore, it is less likely that the first job opportunity offered to an individual initiating their job search would be the most suitable for them. As a result, due to the heterogeneity in required qualifications and capacities of job seekers, it is rational for individuals to take time to search for the appropriate job (Stigler, 1962).

To understand the trade-off made by job seekers during their job search, Lippman and Mccall (1976) introduced the concept of the reservation wage, W^*, which is defined as the minimum wage below which an individual refuses a job offer. In this case, the probability of accepting a job offer with a wage, W is equal to the probability that W exceeds W^*. In this theoretical framework, the unemployment duration is a decreasing function of the probability, π, of accepting a job offer. If π is high, the job search time and the unemployment duration will be short.

However, non-monetary attributes also impact the utility derived from the job taken. Clark (2001) demonstrates that, in addition to wages, the type of employment contract is also an important characteristic for workers. Other more or less perceptible elements may also be considered, such as working hours, long working periods, the nature of tasks to be performed, the work environment, or the prospects for promotion associated with the proposed job. Consequently, these non-monetary attributes denoted as "y" and the monetary wage "w" jointly define the overall utility of the job (Borjas & Goldberg, 1978). Thus, the duration of unemployment for an individual is a decreasing function of the probability, π, of accepting a job offer, which depends not only on the reservation wage "w" but also on the overall value of the job, represented by $v = v(w, y)$.

While the previously mentioned models assume the homogeneity of individuals seeking employment, improvements in the model have shown that job attributes can be more or less valued according to individuals. As a result, trade-offs between these attributes occur. For example, women with children may prefer working hours

over salary, leading to variations in individual unemployment durations. Consequently, job offers with less-valued attributes by the individual may require additional financial incentives to compensate for the lost utility associated with that job. Thus, the value of the job also depends on individual characteristics denoted as "X", and the overall job value is represented as $v = v(w, Y, X)$ (Detang-Dessendre, Drapier & Jayet, 2004). In this regard, several individual characteristics are commonly used to determine job value, such as education level, age, gender, and family background. We explore the impact of these determinants in the following subsection.

Thus, a job offer may be more or less attractive depending on the individual's characteristics, and consequently, each individual, based on their individual characteristics, will have a different duration of job search.

Hypothesis 1: Individual heterogeneity among graduates results in varying durations of job search.

Another point highlighted by this model concerns the characteristics that allow individuals to discover information during their job search process (Drapier, 2001). Implicitly, the Job Search theory rests on the assumption that the amount of information about the job market acquired by job seekers is directly related to the effort they invest in it. The more a job seeker tries to prepare for a job, the more likely they are to secure employment (Farkas & England, 1985).

The quantity of job offers reaching the individual is directly and positively influenced by the effort exerted by the unemployed person to access a job. Furthermore, the individual's duration of unemployment will also depend on this effort (Kahn & Low, 1990).

Hypothesis 2: The more a graduate searches for a job, the greater their chances of having a short duration of unemployment.

Education, especially the level of degree, is an indicator of certain qualities of an individual (intelligence, organizational abilities, work capabilities, etc.). According to Arrow (1973), the originator of the screening theory, a degree serves as an indicator that allows for the sorting of different candidates before hiring. The level of education, therefore, presents, for the employer, a signal of the productive potential of the individual (Spence, 1973); thus, the most highly educated individuals are potentially the most productive future employees.

The "job competition" model (Thurow, 1975) is based on competition among individuals, where the most qualified individuals prevail. According to this theory, job competition creates a queue where the most qualified individuals are privileged and placed at the top of the list (Moncel & Rose, 1995).

Hypothesis 3: Higher qualifications enable faster access to stable employment.

Finally, the duration of job search may vary depending on the type of job being sought and the type of labour market. Specifically, in a labour market, the quality of available jobs can vary according to the segment of the labour market the candidate targets. In other words, each labour market segment may reflect a different queue length from the others, and its length evolves depending on the specified labour market.

Indeed, Drapier (2001) emphasizes that the lengthening of the job search duration for higher-educated graduates is potentially motivated by the pursuit of greater professional stability. Thus, Drapier's work identified three main job search strategies. The first strategy is related to more highly qualified graduates who easily access the primary job market. For them, job search aims to identify the most attractive job opportunities and better position themselves in the primary job market. The second strategy concerns individuals with lower qualifications who have a medium-level diploma. For them, the job search aims to access either a durable and stable job or an unstable job with better prospects for transitioning to a stable job. Finally, the third and last strategy justifies the conduct of individuals with very low qualification levels. For them, due to their uncertain situation, the job search primarily aims to secure a job (mainly in the secondary job market) that will allow them to develop their skills and, consequently, their capacity for reemployment. Thus, for these young individuals, there is no salary advantage associated with a prolonged search.

The fact that higher-educated graduates take longer to exit unemployment may be attributed to their job search behaviours. Indeed, higher-educated graduates are more likely to reject a job opportunity. Refusal is considered here as a mediator that explains (at least in part) how the level of education negatively impacts the duration of unemployment for graduates.

Hypothesis 4: The lengthening of the unemployment duration for higher-educated graduates is due to the hypothetical expectation of finding a suitable job opportunity.

2.2 Determinants of graduates' unemployment

As mentioned earlier, the sociodemographic characteristics of job seekers play a determining role in their integration into the job market. On one hand, the duration of an individual's unemployment is a decreasing function of the probability of accepting a job offer, which depends on the overall value of the job. On the other hand, the individual characteristics of job seekers play an important role in the selection process and impact the recruiter's decision.

2.2.1 *Individual and Family Factors*

Individual and family factors include gender, age, parents' education level, and socioeconomic background. Most studies report that male employment outcomes are better than female outcomes in Morocco (HCP, 2019). Women are more likely to be unemployed than men (Berahou & Berhili, 2019). The results of a study by Ezzrari, Khellaf & Nihou (2018) confirm that inactivity, unemployment, and unpaid work are more prevalent among young women compared to young men. Age in turn impacts the situation of graduates in the job market, with the majority of the unemployed population aged 15 to 29, accounting for a rate of 65.7% (HCP, 2019). Similarly, Benhabib (2017) found that individuals between the ages of 15 and 24 suffer the most from unemployment compared to those aged 25 to 30 and 30 and above. This is explained partly by the magnifying effect of the unemployment rate indicator and partly by the difficulties of integration faced by young individuals with no work experience (El Aoufi & Bensaïd, 2005).

The aforementioned studies lead us to formulate the following hypotheses:

Sub-hypothesis 1: Women, with equal education or human capital, often face more difficulties in finding a job after leaving the education system compared to men.

Sub-hypothesis 2: As graduates age, the time required to find a job decreases.

Moreover, Moroccan and foreign studies have emphasized the role of parental income and level of education. In Morocco, being from a household with a monthly income not exceeding 2500 dirhams significantly increases the probability of remaining unemployed (Bougroum, Ibourk & Trachen, 2002). Similarly, Ezzrari,

Khellaf, and Nihou (2018) in a more recent study concluded that young individuals from affluent backgrounds have a higher chance of accessing all types of employment or being inactive compared to being unemployed, in comparison to those from poor households.

Indeed, the education of parents allows them to acquire cultural and social qualities that could improve their socio-professional situation. The higher the parents' level of education, the greater their purchasing power is expected to be, leading to improved employability of their children. Despite the above, we formulate the following hypothesis:

Sub-hypothesis 3: Higher education levels of parents increase the chances of having a shorter duration of unemployment.

In addition to individual characteristics, several individuals may face insertion difficulties due to their place of residence (Kain, 1992). Employment insertion conditions vary depending on the growth dynamics of the area or the lack of certain skills.

The influence of characteristics associated with spatial dimensions on employment insertion, particularly the urban/rural divide, has fuelled literature on the analysis of employment integration. On this point, the influence of the place and region of residence on access to employment is widely recognized (Benhabib, 2017; Ezzrari et al., 2018). Studies also reveal that young individuals from urban areas stay unemployed longer compared to youth from rural areas (El Aoufi & Bensaïd, 2005). It is also important to note that the probability of unemployment increases for graduates who lived with their parents while studying at the university compared to those who did not (Berahou & Berhili, 2019).

Regarding the place of residence, intermediate changes in the place between the end of studies and exiting the initial training system, with unknown places of residence, made it easier to consider the place of residence of the parents for making comparisons.

Sub-hypothesis 4: The place of residence of the parents impacts the duration of unemployment.

Depending on the chosen region, the effects of human capital may differ.

Sub-hypothesis 5: The chosen research region contributes to finding employment more quickly. It is suggested that finding employment will be faster in Grand Casablanca than in regions with less dynamic economic conditions.

2.2.2 *Graduates' Job Search Activities*

The job search behaviour is modelled by the nature of the search activities and the effort made by each job seeker during their job search process. This effort, also known as job search intensity, has a direct and positive effect on the number of job opportunities that reach the individual in each period (Gautier, Moraga-Gonzalez & Wolthoff, 2007). Job search intensity can be measured in various ways, such as the number of combined job search methods (Weber & Mahringer, 2008), the search distance (Bouabdallah, Cavaco & Lesueur, 2002), the number of job applications (Gautier et al., 2007), and the time spent on job search (Langot & Lebon, 1994).

The method or job search activity employed by the individual can also have an influence on the probability of finding a job (Ruhm, 1995). Job search methods can be summarized into three main strategies (Lindeboom & van Ours, 1997), which include: normal methods and procedures like spontaneous applications and job advertisements; using the services of public and private employment agencies; and relying on personal and professional networks. Thus, these job search activities have a discriminatory effect on the duration of unemployment (Osberg, 1993). For instance, the study by Bunel and Lenoir (2004) highlighted the effectiveness of using family, friends, and professional networks for professional integration.

Therefore, the effort made and the multiplication of job search activities can exert a direct and positive influence on the duration of unemployment (Lim & Lee, 2019). These activities may include visiting recruitment agencies to find a job, directly sending spontaneous applications by postal or electronic means or through the company's website, using digital social networks and the internet in job search, and relying on personal and professional connections.

Sub-hypothesis 6: The time required to find a job differs depending on the job search activities performed.

Sub-hypothesis 7: The more a job seeker intensifies their search, the shorter their duration of unemployment.

2.2.3 *Factors Related to Education*

Regarding factors related to education, the level of education, specialization, year of graduation, and place of residence significantly impact graduates' employability and the duration of their unemployment (Shamemo & Zewde, 2022). In this regard, Escudero and Mourelo (2014) demonstrated that the education variable strongly influences the likelihood of young people having a job; higher education increases the probability of employment by 24%. However, in Morocco, Ezzrari, Khellaf, and Nihou (2018) assert that university graduates struggle to integrate into the job market, with graduates experiencing the highest unemployment rates in Morocco (17.3% for graduates compared to 3.5% for non-graduates) (HCP, 2019). This phenomenon may be associated with the issue of graduate overproduction or overinvestment in the country's university education, graduate unemployability, and economic recession (Idowu, 1987).

While several studies agree that the level of education remains a determining factor for professional integration (Gunarathne & Jayasinghe, 2021; Shamemo & Zewde, 2022; Escudero & Mourelo, 2014); its impact is dependent on the field of study (Lefresne, 2003). For instance, graduates in vocational fields integrate into the job market more rapidly than others (Giret, 2000). Graduates in the liberal arts and the social sciences are less likely to find employment than engineering graduates. Moreover, graduates in medicine and pharmacy are more likely to find employment than those in the humanities, as the former are linked to specific qualifications in specialized fields.

The age of the degree also increases the likelihood of unemployment; holders of degrees aged over one year have relatively fewer chances of securing a job (Bougroum et al., 2002).

Concerning internships, theoretically, they offer several advantages. Firstly, they allow young people to apply the skills acquired during their initial training. Secondly, internships serve as a bridge between the academic environment and the professional world, providing opportunities to build relationships and develop a social and professional network that facilitates access to the job market (Barbusse, Glaymann & Grima, 2007). Finally, internships are a crucial step for young graduates to meet the experience requirements sought by employers (Berahou & Abdouni, 2021).

In addition to the aforementioned factors, this study considers the level of education as a risk factor for prolonged unemployment. In Morocco, a significant portion of unemployed individuals holds higher education degrees (HCP, 2019). Graduates naturally seek jobs, salaries, and working conditions commensurate with their level of education (Mohd Abdul Kadir et al., 2020); if they cannot find such positions, they extend their job search in hopes of securing desired employment or opt for various forms of voluntary non-employment (Gérard & Schlemmer, 2003). Hence, graduate unemployment is closely related to job mismatch (Hana Kaharudin et al., 2023).

Sub-hypothesis 8: Individuals with higher-level degrees take longer to find employment than those with lower-level degrees. However, based on empirical literature review, we can provide an exception to this hypothesis.

Sub-hypothesis 9: Engineering and business school graduates secure stable employment more quickly than doctoral graduates.

Sub-hypothesis 10: Individuals who have completed internships in companies find stable employment more rapidly than those who have not.

Sub-hypothesis 11: The longer these internships, the shorter the time required to find employment.

The duration of a graduate's unemployment also depends on the degree specialization.

Sub-hypothesis 12: Graduates from certain specializations take less time to find employment.

3. Methodology, Data, and Model

In regard to our epistemological stance and methodological choices, we have adopted a positivist approach and a hypothetico-deductive reasoning for this research. The primary objective of our study is to investigate the microeconomic determinants of unemployment duration experienced by graduates, based on a set of hypotheses derived from an extensive literature review. These hypotheses will be empirically tested to draw conclusions following a hypothetico-deductive approach.

3.1 Data presentation

This study utilized data collected between August 3, 2021 and September 30, 2021, through a retrospective survey conducted among a randomly selected cohort (outgoing flow sampling) from an exhaustive list provided by the National Social Security Fund in Morocco. The cohort comprises young graduates who benefited from the insertion contract (IDMAJ[1]) between 2015 and 2019.

The decision to use a database of graduates who benefited from the insertion contract is justified for two main reasons. Firstly, eligibility for this programme requires individuals to have at least a higher education diploma or be graduates of vocational training and have no prior work experience. Secondly, the database provides a comprehensive list of graduates who benefited from the contract between 2015 and 2019. Additionally, the data includes the dates of insertion for these graduates, which eliminates right-censoring issues concerning unemployment durations since the initiation of the database corresponds to the time of benefiting from the insertion contract.

The sample size was determined using an online sample size calculator, Raosoft (Raosoft, 2010), indicating a required sample of 385 graduates. Similarly, Krejcie and Morgan's table suggests that a sample of 384 is sufficient for a population of 1,000,000 or more (Krejcie, 1970).

Our working sample consists of 468 graduates out of a total population of 3,660,176 graduates. The distribution of the 468 graduates by degree and gender (Table 1) shows that 60% are female. Gender disparity is amplified when considering the distribution by degree; females represent 85.7% of graduates with a Master's degree, while males constitute 60% of the graduates with a doctorate.

Regarding the highest degree possessed before their first employment, 39.5% of graduates hold a bachelor's degree, 23.9% have a master's degree, and 15.38% possess an engineering degree or other degrees awarded by specialized schools. Only 12.34% of graduates hold a diploma from vocational training, which can be accounted for by the high number of non-responses to our questionnaire among these graduates.

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[1] The IDMAJ insertion contracts aim to help companies recruit young graduates by providing them with their first professional experience. These contracts offer companies exemptions from social security charges and provide employee-trainees with exemptions from both social security and tax charges.

Table 1. Characteristics of the sample of graduates

		Gender		
		Female	Male	Total
Vocational training diploma (technician & specialized technician)	Count	32	28	60
	%	53.3%	46.7%	100.0%
Undergraduate degree (GUSD, UTD)*	Count	8	4	12
	%	66.7%	33.3%	100.0%
Bachelor's degree	Count	100	92	192
	%	52.1%	47.9%	100.0%
Graduate degree (Master)	Count	96	16	112
	%	85.7%	14.3%	100.0%
Engineering degree and other degrees awarded by training schools	Count	36	36	72
	%	50%	50%	100.0%
Doctorate	Count	8	12	20
	%	40.0%	60.0%	100.0%
Total	Count	280	188	468
	%	59.8%	40.2%	100.0%

Source: Authors' compilation.
Note: *GUSD (General University Studies Diploma); UTD (University Technology Diploma).

3.2 Presentation of the variables for analysis

Table 2 presents the variables used in the study. The duration of unemployment exit is the dependent variable. It refers to the time it took for graduates to find their first job after obtaining their diploma. To calculate this period, we subtract their month of graduation (e.g., February 2018) from the month in which they started their first job. If a person was employed before obtaining their diploma, their duration of unemployment exit will be zero. The other variables will be utilized as independent variables to explain the duration of unemployment.

Table 2. Presentation of Variables and Acronyms Definitions

Variable	Label	Modalities
Unemployment duration (months)	DChomage	Start month of employment -(February 2012) - Month of diploma attainment
Age	Age	Age of the graduate at the time of graduation
Gender	Genre	Female / Male
Parents' place of residence	RdPa	Rural / Urban
Mother's education level	NivEdM	No education; Below high school diploma; High school diploma or above
Father's education level	NivEdP	No education; Below high school diploma; High school diploma or above
Degree	Diplôme	Vocational training diploma (technician et specialized technician); Undergraduate degree (GUSD , UTD); Bachelor's degree; Engineering degree and other degrees awarded by training schools; Doctorate.
Degree specialty	SpDip	Field of study of the degree
Delay in obtaining the degree	TObDip	On time; With a year of delay; More than a year of delay
Participation in extracurricular activities	ParActPara	Yes; No
Total duration of internships	DCuSt	Total duration of internships in months
Number of internships	NbrStag	Number of internships completed by the graduate
Contacting recruitment agencies	CoAgRecr	Never; Once; Multiple times
Use of personal and professional networks	RechRel	Never; Once; Multiple times
Search on the Internet and social networks	RechRS	Never; Once; Multiple times
Search by unsolicited application	CaSpoDirec	Never; Once; Multiple times
Search by unsolicited application by mail	CaSpoCour	Never; Once; Multiple times
Benefit from job search training	FRech	Never; Once; Multiple times

Source: Authors' compilation.

3.3 Presentation of the model

In our study, we employ structural equation models (SEM) with survival outcomes. The survival analysis method examines the period during which subjects remain in a certain state and estimates the factors affecting such a period, as well as the intensity of the effects of these factors.

Specifically, we use the accelerated failure time (AFT) model, which allows us to complete the information on the explanatory variables by specifying the distribution law of the survival data. The AFT model is expressed in the general form:

$$\text{Log}(T) = \alpha + \acute{X}\beta + \sigma\log(T_0) \quad (1)$$

where: α is a parameter (constant) of overall location, β is a vector of parameters associated with X, σ is a scale parameter (positive), and is a random variable whose distribution law defines the law of T (conditionally on x) (Bonnal & Fougère, 1990). Using the "Minitab" programme, we used the Anderson-Darling statistic (Anderson & Darling, 1954) to check the distribution law of the data. Our data follows a Weibull distribution.

The use of structural equation models is justified because these methods are particularly suitable for intermediary variables. These variables explain how the relationship between the independent variable and the dependent variable is carried out, decomposing this relationship into direct and indirect mediated effects (MacKinnon et al., 2002).

In the analysis of traditional mediation, the model would be adjusted through a series of linear regression models as described in Baron and Kenny (1986). The advantage of using structural equation modelling is the possibility of adjusting a single model and estimating indirect and total effects. This modelling allows the integration of the simple mediation model into a larger model.

The model in Figure 1 synthesizes the hypotheses drawn from the literature review above. This model estimates the duration of unemployment for the graduate, taking "refusal" into consideration as a mediating variable. The meanings of the acronyms are as presented in Table 2.

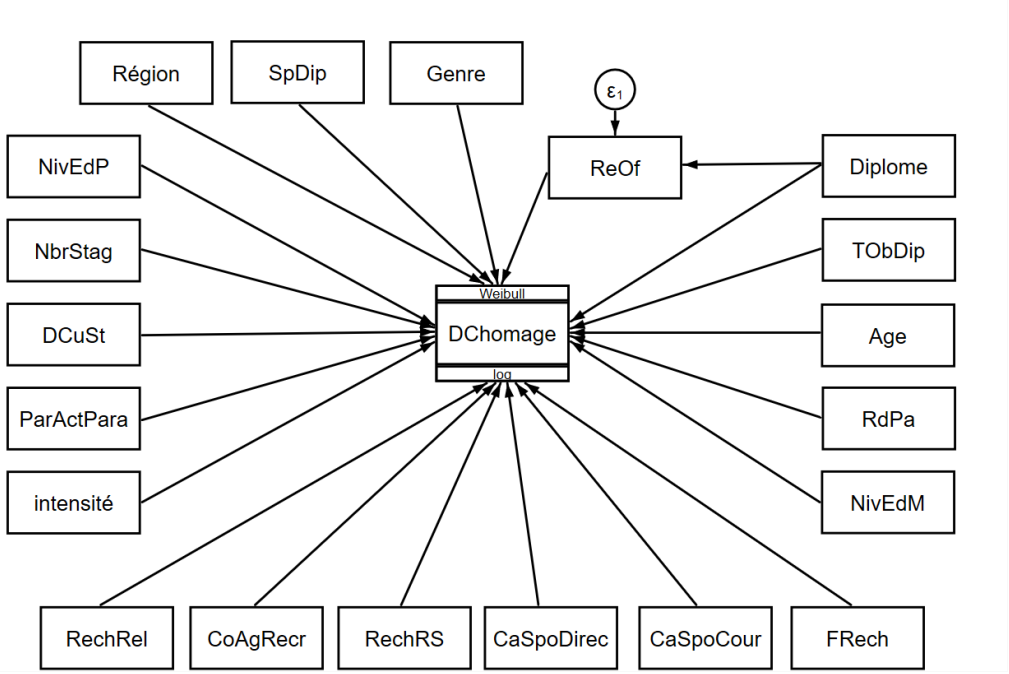

Figure 1. Conceptual Model of the Duration of Unemployment among Graduates

On a technical level, following the Stata guide (StataCorp, 2021), we adapted a single-level mediation model using "GSEM" and subsequently used "nlcom2" to calculate indirect and total effects. For variable selection in the model, we employed a stepwise descending method based on the Akaike Information Criterion (AIC) and Bayesian Information Criterion (BIC) as stopping criteria for the procedure.

4. Interpretation and Discussion of Results

Acceleration factors or time ratios are required to interpret the coefficients of the model. A unit increase in the explanatory variable indicates that the average/median survival time will change by a factor of Exp (coefficient). If the coefficient is positive, then Exp (coefficient) will be >1, which will slow down the event time (increase the average/median survival time). Similarly, a negative coefficient will reduce the average/median survival time (accelerate the event time).

[2] Nonlinear combinations of estimators involve calculating point estimates, standard errors, test statistics, significance levels, and confidence intervals for non-linear combinations of parameter estimates after any estimation command in Stata (Stata.com).

Table 3. Estimation of the GSEM Model

Unemployment Duration			Job Refusals			
			Once		Multiple Times	
Variables	Coef	T.R	Coef	H.R	Coef	H.R
Number of Internships	0,033**	1,034				
Intensity of Job Search	-0.255*	.847				
TOpDip						
At Time Ref	Réf					
With 1 Year Delay	0.0731	1.075				
With More Than One Year	-0.261**	.772				
Education						
Vocational Training Degree	Réf		Réf		Réf	
Undergraduate Degree	1.119***	3.062	0.262	1.3	2.277***	9.75
Bachelor's Degree	0.535***	1.708	1.099***	3	1.386**	4
Master's and DEA Degree	0.619***	1.857	0.656*	1.927	2.322***	10.198
Engineering and Other School Degrees	0.431***	1.539	-0.143	.866	2.016***	7.511
Doctorate	0.239*	1.270	1.361	3.9	3.887***	48.75
Previously Refused a Job						
Never	Réf					
Once	0.0812	1.084				
Multiple Times	0.211***	1.235				
Place of Residence: Rural	Réf					
Urban	0.188***	1.207				
Age	-0.022***	.976				
Mother's Education Level						
No Education	Réf					
High School Degree or Below	-0. 330***	.718				
Above High School Degree	-0.253***	.775				
Social Network Search						
Multiple Times	Réf					
Never	0.105	1.303				

Unemployment Duration			Job Refusals			
			Once		Multiple Times	
Variables	Coef	T.R	Coef	H.R	Coef	H.R
Diploma Specialization	Réf					
Agro-Industry and Textiles	0.102	1.010				
Administration, Finance, and Commerce	0.731***	2.078				
Electrical, Mechanical, and Electromechanical	0.350***	1.419				
Mathematical, Physical, and Chemical	0.577***	1.781				
Biology and Geology	0.400**	1.493				
Economics and Social Sciences	0.265***	1.303				
Building and Public Works	0.079	1.083				
Computer Science	0.073	1.076				
Logistics, Transport, and Telecommunication	0.391	1.479				
Legal Studies	0.238*	1.269				
Education and Teaching Professions	-1.498***	0.223				
Communication and Information	-1.194***	0.302				
Health	0.076	1.080				
Tourism, Hospitality, and Catering	0.211	1.235				
Agriculture, Forestry, and Maritime Fishing	0.842**	2.321				
Constant	2.498***		-0.956***		-1.872***	
Observations	468	468	468		468	

Source: Stata Output Version 15.

4.1 Sociogeographic determinants of unemployment duration

The results of the model show that, holding other predictors constant, a one-unit increase in age reduces the time required for job placement by 2.4%. In other words, as individuals get older, they experience a shorter duration of unemployment. This can be attributed to the fact that older job seekers, especially those with longer

educational backgrounds, tend to be more actively engaged in the job search process, and they may be more willing to lower their job expectations to expedite their entry into the workforce. According to Lippman and McCall (1976), the finite time horizon reduces the reservation wage of job seekers.

Moreover, graduates whose parents reside in urban areas have, on average/median, 1.21 times longer unemployment duration compared to those whose parents live in rural areas. This result suggests that living in rural areas reduces the unemployment duration among young graduates. Previous studies in Morocco have also reported similar findings, such as the work of Ezzrari, Khellaf, and Nihou (2018), who found that youth unemployment in urban areas remains significantly higher than in rural areas (el Aoufi & Bensaïd, 2005). This can be attributed to the fact that in rural areas, the nature of activities, particularly agricultural ones, facilitates youth integration into the labour market, as they do not require a specific level of education or qualification. Additionally, graduates from rural areas tend to be less demanding when it comes to their first job, as their primary concern is achieving financial independence while settling in urban areas.

Regarding the parents' level of education, the results indicate that graduates whose mothers have some level of education, either less than or equal to a high school diploma or above a high school diploma, have a shorter average/median unemployment duration (by 28.2% and 22.5%, respectively) compared to graduates whose mothers have no formal education. On the other hand, the father's level of education did not have statistically significant effects on the probability of escaping unemployment in this model. These results are consistent with previous studies, including the work of Ezzrari, Khellaf, and Nihou (2018).

4.2 Job search activities and intensity

The intensity of job search, measured by the number of search methods employed, has a statistically significant effect, especially in activities such as applying for jobs spontaneously, networking through personal and professional connections, repeated contact with recruitment agencies during the job search period, and utilizing online job search and social media. A one-unit increase in the intensity of job search indicates that the average unemployment duration will be reduced by 15.3%, accelerating the insertion process.

Overall, the results show that graduates who engage in a greater number of job search activities are more likely to have a shorter unemployment period. Regarding specific job search activities, utilizing online job search and social media repeatedly is associated with an average and median probability of 30% shorter unemployment duration. However, other job search activities did not have statistically significant effects in our model.

4.3 Determinants related to education

The results indicate that graduates who obtained their diploma with a delay of more than one year have a higher chance of experiencing a shorter unemployment duration. The delay accelerates the insertion process by 23%. This result can be explained by the fact that graduates who experience delays become less demanding regarding job characteristics and may attempt to shorten their job search period by accepting jobs below their expectations to catch up.

Regarding internships, the number of internships completed by graduates before their first job has a statistically significant effect on unemployment duration. Each additional internship lengthens the graduate's insertion period by an average of 3.5% per internship. However, the cumulative duration of internships and participation in extracurricular activities did not have statistically significant effects in this model.

The type of diploma also had a significant effect. Graduates from vocational training programmes have, on average and median, three times shorter unemployment duration than graduates with a university undergraduate degree. This result indicates that Moroccan companies prefer graduates from vocational training programmes for positions that require a level of approximately a bachelor's degree.

Regarding other degrees, holding a bachelor’s or master’s degree extends the unemployment duration (increases the average/median duration by 70% and 85%, respectively) compared to graduates with vocational training degrees.

As for graduates from engineering and business schools, they are also more likely to experience longer unemployment durations (46%) than graduates from vocational training programmes. However, the average duration for engineering graduates remains lower than that of their counterparts with a bachelor's or a master's degree. The impact of the diploma level on unemployment duration is thus attenuated when it comes to engineers and graduates from business schools.

These findings align with those of Cherradi and Skalli (2020). They can be attributed to the nature of the Moroccan productive structure, which remains relatively undiversified and dominated by activities with low-skilled labour intensity (Agénor & Aynaoui, 2015).

The results of this model confirm that the diploma level can be interpreted as a risk factor for prolonged unemployment duration. This finding may be attributed to the job search behaviour rs of higher-level graduates, who tend to have higher job expectations. As a result, graduates with higher-level degrees are more likely to refuse job opportunities, and this refusal acts as a mediator in explaining (at least in part) how the diploma level negatively impacts unemployment duration among graduates.

4.4 Relationship between degree and unemployment duration, and the mediating effect of refusal

Using structural equation modelling, we were able to estimate the unemployment duration among graduates, taking into account the mediating variable of "refusal" along with other observed variables (Figure 1).

Baron and Kenny (1986) present a series of four successive and necessary tests (Figure 2) to examine the mediating effect of a mediator variable (in this case, "refusal") in the process of the impact of an independent variable (degree) on a dependent variable (unemployment duration).

According to Baron and Kenny (1986), and as explained in Figure 2, the mediating effect exists when the variations in the independent variable (degree) significantly affect the variations in the mediator variable (represented by 'a'), and these variations in the mediator variable have a significant effect on the dependent variable (unemployment duration, represented by 'b'). A perfect or pure mediator variable is one that fully transmits the effect of the independent variable on the dependent variable. In this case, the direct effect (c') completely disappears with the introduction of the mediator variable in the model.

However, typically, partial mediation is more common (Baron & Kenny, 1986; MacKinnon et al., 2002). In this case, the introduction of the mediator variable in the model reduces the link (c) between the independent variable and the dependent variable, but does not make it disappear completely. If mediation is partial, the

effect (c') should be smaller than the initial effect (c) obtained in the absence of the mediator variable (MacKinnon, Warsi & Dwyer, 1995).

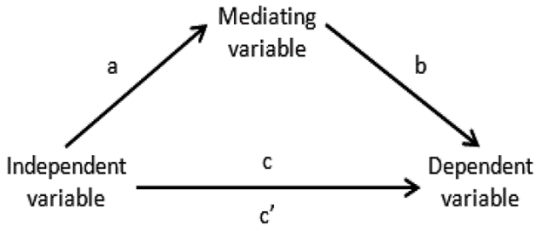

Figure 2. Baron and Kenny's model for the analysis of mediator variables

Source: Baron Kenny,1986, p. 176.

In our case (see Table 3), the direct effect of the degree on unemployment duration is highly significant from a statistical standpoint for all types of degrees. The first step is therefore verified. Regarding the second step, the direct effect of the degree on the likelihood of having refused job offers is also statistically significant. As for the third step, at this stage, the link between refusal and unemployment duration is also statistically significant. Concerning the fourth step, in our case, the coefficient is different from zero even when controlling for the mediator variable, indicating partial mediation.

After verifying the existence of a mediation relationship, the model allows us to decompose the effect of the degree on unemployment duration into an indirect and direct effect. The percentage of the mediator effect relative to the total effect is obtained by the following ratio:

Indirect Effect / Total Effect * 100; It equals 100% if the mediation is complete (Ambler, 1998).

The results of the *nlcom* function are presented in Table 4, which shows, for each degree, the proportion of its effect that is mediated. According to this model evaluating the effect of education in the presence of the mediator, the proportion of the effect mediated by the number of job refusals on the logarithmic scale was 77% for a doctoral degree, 53% for an engineering degree, 44% for a master's degree, 35% for a bachelor's degree, and 30% for other degrees.

The graduate's attitude in the job market, therefore, has a significant impact on their likelihood of escaping unemployment. As the level of education increases,

graduates become more demanding, which may lead to a longer unemployment duration. Additionally, the duration can be prolonged due to the insufficient quantity and quality of opportunities available in Morocco (Bougroum et al., 2014), which often do not match the graduates' level of education (HCP, 2019).

Table 4. Mediation Analysis Assessing the Indirect and Total Effect of Education on Unemployment Duration

Indirect Effect	Coef.	Std. Err.	P>z
Doctorate	0.820826	0.2821295	0.004
School Diploma	0.4258362	0.1507918	0.005
Master's Degree	0.490425	0.1617611	0.002
Bachelor's Degree	0.2927689	0.1374762	0.033
Technical Diploma	0.4809318	0.2070385	0.02
Total Effect	Coef.	Std. Err.	P>z
Doctorate	1.060197	0.3203754	0.001
School Diploma	0.8099268	0.1771918	0.000
Master's Degree	1.109706	0.1793272	0.000
Bachelor's Degree	0.8281976	0.1735811	0.000
Technical Diploma	1.600134	0.2583085	0.000
Percentage of Mediation Effect Compared to Total Effect			
Doctorate			77%
School Diploma			53%
Master's Degree			44%
Bachelor's Degree			35%
Technical Diploma			30%

Source: Stata 15 NLCOM Command Output

5. Conclusions

This study examined the microeconomic determinants of unemployment duration. We examined the effects of individual, family, and educational characteristics, and job search behaviour on the unemployment duration experienced by graduates. Through survival analysis using data collected from a retrospective survey of young graduates who benefited from the integration programme in Morocco, several conclusions were drawn.

We demonstrated that the level of education can be considered a risk factor for lengthening the unemployment duration in the Moroccan labour market. This is justified by Morocco's labour-intensive production structure with a low-skilled workforce (Agénor & Aynaoui, 2015).

However, the fact that higher-educated graduates take longer to exit unemployment is not solely due to their education but also attributable to their job search behaviours. The more demanding they are, the longer the likely duration of their unemployment. Likewise, the analysis results of the model revealed that engaging in numerous job search activities significantly increases the likelihood of escaping unemployment.

Based on these results, this study makes the following recommendations. Firstly, there is a need to overhaul the curriculum to be in harmony with business needs, and government spending should be directed towards the productive sector where major positive impacts are felt. This would lead to a substantial decrease in unemployment (Okumoko & Akarara, 2019). Secondly, detailed support is necessary during the period of unemployment tailored to the job seeker's situation (for example, assisting them in adopting effective job search strategies).

Lastly, the duration of exiting unemployment and the probability of escaping unemployment are significantly determined by individuals' subjective thoughts and psychological perceptions. Graduates need to be more realistic about their expectations, as blindly pursuing a higher-quality first job may prolong their unemployment period and reduce the likelihood of escaping unemployment. Moreover, the educational system and social institutions should provide young people with a clearer vision of the Moroccan labour market, its characteristics, and its needs.

It should be noted that this study is based on the assumption that employment is a homogeneous entity. However, it would be crucial (albeit more complex) to

differentiate between different outcomes of unemployment and consequently evaluate transition rates and durations that vary according to these outcomes. Exploring a more detailed econometric study of the various possible states of exiting unemployment (e.g., towards stable or precarious employment) would undoubtedly contribute to a better understanding and control of the phenomenon, given the competitive and exclusive nature of these states.

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