

# Dynamics Of Overqualification: Identification Of Graduates At The Beginning Of Their Careers On The Labour Market In Côte d'Ivoire

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## Abstract

This paper summarizes the arguments and counterarguments within the scientific discussion on the transition to adequate employment of overqualified graduates in their early career jobs. The main purpose of the research is to analyse the persistence of overqualification of early career graduates in the labour market in Côte d'Ivoire. The systematization literary sources and approaches to solving the problem using panel data and probit random effects models' capturing unobserved individual specific effects was used as an econometric approach. The relevance of the decision of this scientific problem is that the choice of an overqualified job at the beginning of a career allows graduates to have work experience that would improve the opportunities for internal or external upward mobility in the future. Overqualification would therefore be a transitory phenomenon. Data from the survey on the sources of skills mismatch in Côte d'Ivoire were used to carry out this study. This survey covered 974 general, technical and vocational education and higher education graduates in the labour market over the period 2011-2017. The object of research is to analyse the persistence and real dependence of early career overqualification on future overqualification in the labour market in Côte d'Ivoire. The research empirically confirms and theoretically proves that overqualification persists among graduates during the first six years of their professional careers. The experience of previous overqualification and overqualification at the beginning of the period strongly explain the risk of future overqualification. The results of the research can be useful for the government to put in place or strengthen public measures to help graduates leaving the education system gain work experience and improve the quality of information on job vacancies in the labour market.

**Keywords:** Dynamic Probit, career, underemployment, overqualification, employment, youth.

**JEL Classification:** I21, J21, J24.

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## Introduction

The labour market in sub-Saharan Africa faces a sub-optimal distribution of graduates across jobs. This sub-optimal distribution of graduates is a sign of an inefficient distribution of skills in the labour market.

Overqualification, a form of underutilization of the workforce (Feldman, 1996), affects 25.45% of workers in Côte d'Ivoire. Over-qualification is defined as the existence of a gap between the worker's level of qualifications and the level of qualifications required by the job he or she holds. Overqualification leads to a loss of wages (Hartog, 2000), lower job satisfaction (Allen and van der Velden, 2001) and low productivity (Gautier and Teuling, 2015). In the economy, overqualification leads to significant losses in productivity and competitiveness (Mc Gowan and Andrews, 2015).

Cross-sectional analyses on the labour market in Côte d'Ivoire<sup>1</sup> show that overqualified workers earn less than adequate workers in their jobs with the same qualifications. They have fewer opportunities for promotion than their suitable colleagues working in the same company.

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<sup>1</sup> Inadequacy, wage gap and professional mobility in Côte d'Ivoire, Ongoing study by Yapo Andoh Régis Vianney and Clement Kouakou.

As a result, one might wonder why job seekers accept jobs with requirements below their skill level. One possible answer is that this is the shortest path to a job corresponding to the level of education achieved. This step hypothesis was most clearly formulated by Sicherman and Galor (1990). According to their occupational mobility theory, overqualification is an investment in work experience that improves opportunities for promotion to higher-level positions within or outside the company. In addition, by taking these positions, workers avoid long-term unemployment (Arulampalam, 2001), which results from a negative signal, skills depreciation or psychological discouragement. However, overqualification could just as easily delay the transition to adequate employment. If over-qualification occurs only temporarily at the beginning of the graduate's career, before graduates find suitable jobs, losses can only occur in the short term, until the available skills are optimally distributed. On the other hand, if graduates are overqualified in the long term, long-term losses may occur due to continued underutilization of human capital. In this particular case, private investment in education and public investment by the State in people's skills could be unproductive, wasted due to a low return in terms of wages or tax revenues. This is particularly important in a context of continued increases in public spending on education in most countries in Sub-Saharan Africa.

The relatively small change in the demand for skilled labour in Côte d'Ivoire is considered to be the result of the typology of the Ivorian economy, based mainly on the informal sector. There is overqualification because the shift in the supply of skilled labour is not offset by a shift in the demand for skilled labour.

However, overqualification may occur due to the heterogeneity of graduate skills and job vacancies, combined with asymmetric information on job opportunities available on the labour market and frictions leading to costly job search (Sattinger, 2012).

The persistence of overqualification can be attributed either to constant specific individual characteristics that influence the probability of being overqualified during the observation period or to a behavioural effect such that past overqualification increases the probability of future overqualification. When there is a real dependence on future overqualification, workers are caught in overqualification due to an obsolescence of workers' skills.

This study analyses the persistence of the situation of overqualification of graduates at the beginning of their careers on the labour market in Côte d'Ivoire. The relevance of the decision to examine this scientific problem is that overqualification in early career employment allows graduates to have work experience that would improve their opportunities for internal or external upward mobility in the future. Overqualification would therefore be a transitory phenomenon, i.e. a short-term phenomenon. The main lines of this study are as follows: Section 1 describes the theoretical framework of the study and provides a literature review of the studies already carried out on the topic. Section 2 discusses the methodology adopted. Here, the estimation methodology and description of the study data will be presented. Section 3 provides the results of the study and section 4 concludes the study.

### ***Section 1: Theoretical framework and literature review***

In this section, the theoretical framework of this study will be described first, based mainly on matching theory, occupational mobility theory, the competition-employment model and assignment theory. Second, a review of previous studies on the issue will be conducted to confirm the theories outlined above.

#### **1.1 Theoretical framework**

Several labour market theories suggest that overqualification is only a temporary phenomenon. Overqualification occurs temporarily if the labour market is out of balance due to a sudden increase in the supply of more educated workers, resulting in a decline in their relative wages. In this situation, employers could hire more skilled, that is, more productive, workers to fill positions previously held by people with low levels of education (Borghans and Grip, 2000). However, overqualification will disappear once individuals react to the decline in educational returns by reducing their investment in education and firms adjust their production processes to use the increased supply of skilled workers. According to human capital theory, prolonged overqualification can only be explained as a statistical artifact<sup>2</sup> resulting from the fact that human capital is observed only incompletely.

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<sup>2</sup> Artificial effect.

According to matching theory, workers and firms cannot predict the quality of matching because of imperfect information (Jovanovic, 1979). Workers may accept jobs that do not match their skills because they do not have information on better offers. As a result, inadequate workers will seek to have new jobs better suited to their qualifications. Workers can temporarily accept a job offer below their level of education while continuing their on-the-job research. Overqualification is only temporary and will occur mainly at the beginning of workers' careers.

The theory of occupational mobility (Sicherman, 1991) suggests that overqualification is only a short-term phenomenon and is part of a strategy for human capital investment by new entrants to the labour market. Workers deliberately choose jobs below their own level of education in order to gain relevant work experience that promotes upward mobility and rapid career progression. From this point of view, early career overqualification is short-lived and can serve as a stepping stone to better jobs within or outside the company. The theory of occupational mobility explains both the motivation of the employee and the employer to accept a transitional phase of overqualification. In addition to higher starting salaries, potential returns on investment in high levels of education include better promotion prospects within companies or a transition to senior positions of responsibility in other companies. Employees who maximize their earnings over their career cycle could accept a lower salary at the beginning of their contract in exchange for a favourable position in the company's promotion queue, which would ensure higher future earnings. If promotions do not go as planned, workers will change jobs or companies. Employers may be willing to accept this agreement since they have the opportunity to verify whether newly hired workers are eligible for higher or more demanding positions in their company at a lower cost during the period of overqualification. Skills gaps are resolved in the long term either by the employee or by the employer.

In contrast, other authors focus on labour market frictions and suggest that overqualification will be very persistent at the individual level, for example because of segmented labour markets (Doeringer and Piore, 1971; Scherer, 2004).

Thurow's (1972) competition-employment model finds that overqualification is not a temporary phenomenon, but a permanent one. Individuals can acquire higher levels of education in order to get the best possible position in the queue of job offers. If, therefore, the educational level of workers increases, a reduction in returns to education helps to drive lower-skilled workers out of low-wage jobs or out of the labour market. Since investments in training are not reduced despite lower academic performance, a higher proportion of highly skilled people will find themselves in jobs below their skill level. In addition, under this model, most of the required skills are acquired through experience or continuing education. As a result, workers in low-level jobs cannot compete for more demanding jobs, suggesting that the state of overqualification is likely to be permanent.

The assignment model addresses the problem of assigning people with different skill levels to more or less complex jobs (Sattinger, 1993). In practice, it is likely that mismatches will occur because the distribution of workers and their skill levels will not fully match the distribution of available jobs and their skill needs. In addition, workers may accept a job offer above their reservation wage before finding the best match due to imperfect information. In the same order, employers can hire a candidate before they find the best candidate. The phenomenon of overqualification would be an inevitable consequence of such a complex allocation process. According to assignment theory, workers' productivity depends not only on individual human capital, but also on the quality of the match between individual characteristics and professional tasks. Taking into account the heterogeneity of skills between workers and jobs, workers in jobs below their skill level cannot fully use their human capital and therefore do not reach their individual productive capacity. Models combining assignment and expensive research have shown that skill mismatches could be a sustainable phenomenon at the individual level (Albrecht and Vroman, 2002; Dolado et al, 2009; Teulings and Gautier, 2004).

## **1.2 Literature review**

Several studies have attempted to assess the validity of the occupational mobility hypothesis that overqualification serves as a springboard to better future jobs. In favour of career mobility theory, studies using simple cross-sectional datasets have often found that work experience is negatively correlated with the probability of being overqualified (Alba-Ramirez, 1993; Sicherman, 1991). The study carried out by Büchel in 2001 shows that there is no significant difference between the promotion prospects of overqualified employees and suitable employees in similar jobs.

Descriptive results based on panel data for graduates entering the labour market in Holland and Germany confirm a strong persistence of overqualification and show that previously overqualified graduates are much more likely to be overqualified in the future (Verhaest and Velden, 2012; Baert, Cockx and Verhaest, 2013; Erdsiek, 2017). The persistence observed may be due in part to constant specific individual characteristics that influence the probability of being overqualified during each observation period, i.e. a non-essential state dependence. Indeed, people may permanently occupy low-demanding jobs because of a lower level of human capital compared to people with the same level of education.

Persistence could also be attributed to a behavioural effect such that past overqualification increases the probability of future overqualification, i.e. true state dependence. True dependence on overqualification may occur because workers are trapped in overqualification due to cognitive decline (De Grip et al., 2008), investment in specific human capital (Pissarides, 1994) or reduced job search effort on the job (Holzer, 1987).

If overqualification causally increases the probability of future overqualification, if there is a real dependence on the state, policy measures that prevent entry or promote exit from overqualification can induce a sustainable reduction in the rate of overqualification. On the other hand, if persistence is due solely to constant individual characteristics, policies facilitating overqualification exits have little impact on future overqualification, unless the factors leading to overqualification are addressed directly.

Another reason for persistent over-qualification may be that workers voluntarily choose qualifications below their own level of education. They may have non-monetary preferences for some available low-demand jobs. For example, these workers may prefer an easier workload than they can find in jobs for which they have received adequate training. Using data on British graduates, McGuinness and Sloane (2011) find that overqualified male workers are more likely to appreciate and choose jobs that offer a better balance with family life. They also find that this group of workers places less emphasis on high earnings. This suggests that the emergence of compensatory wage effects, i.e. a lower wage for an overqualified worker, could be explained by better non-wage characteristics provided by the job (Sattinger, 2012). As long as workers' preferences for low-demand jobs remain unchanged over time, this could lead to another source of false state dependence on overqualification.

Periods of overqualification can change people's preferences or motivation to work in suitable jobs. The experience of overqualification may lead to a lower perception of the market value of the degree, discouraging workers from applying for more suitable jobs in the future (Stewart and Swaffield, 1999). Overqualified workers may also be trapped in poor quality jobs due to a reduced job search effort on the job (Holzer, 1987) or segmented labour markets (Doeringer and Piore, 1971).

Based on a multinational survey of graduates from 13 European countries and Japan, Verhaest and Velden (2012) analysed the persistence of overqualification during the first five years of the professional cycle. Among overqualified graduates in their first job in 2000, 30% of overqualified graduates (Netherlands) and 58% of overqualified graduates (Switzerland) remained overqualified until 2005. In contrast, on average, only 5% of graduates with adequate initial employment were found to be overqualified five years after entering the labour market. Frenette (2004) finds that 74% of Canadian graduates who were overqualified two years after graduation remained overqualified three years later.

Battu et al (1999) use survey data collected 1; 5 and 11 years after graduation for a sample of British graduates who completed their program of study in 1985. They find that about 30% of graduates never had a job requiring a graduate degree during the period observed. Noting a high rate of dependence on the raw state in the data sets used, these studies suggest that overqualification is a persistent phenomenon rather than a transitory state for a significant proportion of workers at the beginning of their careers.

## ***Section 2: Method of Analysis and Data***

In this section, the analytical method adopted for this study will be presented on the one hand and on the other hand, the source of the study data.

### **2.1 Method of analysis**

In this subsection, an empirical review of the models used will be conducted first, followed by a presentation of the estimation model used in the study.

#### ***2.1.1 Critical review of the models used***

Several studies have used panel data estimation models to assess the extent to which overqualification is actually dependent on the state of overqualification at the beginning of a career by controlling for unobserved individual heterogeneity. Using German annual data from 2000 to 2008, Blázquez and Budría (2012) find a very high rate of overqualification. By estimating a trivariate probit model, the authors show that 18% of overqualified workers are dependent on their initial state of overqualification at the beginning of the period.

Using the dynamic random effects model proposed by Wooldridge (2005), the study by Boll et al (2016) reveals that a significant dependence on the initial state of overqualification in the German labour market for the period 1984 to 2011. Using the same estimation approach, Kiersztyn (2013) provides evidence that overqualification is a self-sustaining state in Poland from 1988 to 2008. The risk of being overqualified is four times higher among overqualified workers in the previous period than among those who were not previously overqualified.

Abbring (2006) used the semi-Markovian mixed model "timing of events" for a microeconomic assessment of the impact of the dynamics of unemployed training programmes on unemployment duration and employment stability in the Netherlands using individuals' longitudinal labour market data. Beart et al (2013) used this method to analyse the hypothesis that unemployed young graduates who accept a job below their level of education accelerate or delay their transition to a job corresponding to their level of education in Belgium. This study was carried out using monthly data from a representative sample of young Flemish people.

The study by Chen and Fougère (2013) examines the time-varying probability of leaving the overqualification situation and the wage consequences associated with the transition. They apply Cox's proportional hazard model to monthly panel data from the Survey of Labour and Income Dynamics between 2002 and 2007.

Since studies using duration models have monthly data on the characteristics of individuals in the labour market, this study cannot use these methods because it has annual labour market data.

In our study, the dynamic probit random effects model will be used to show on the labour market in Côte d'Ivoire, the persistence of overqualification and the real dependence of this overqualification on the state (overqualification at the beginning of the period). This model was used by Erdsiek in a study based on panel data covering the first ten years of individual careers of university graduates in Germany, conducted in 2017.

Dynamic models that take into account specific unobserved individual effects are confronted with the problem of endogenous initial conditions. The initial condition problem can be considered an endogenous selection problem because specific unobserved individual factors can affect both the persistence of a state in the labour market and the initial state during the first period available in the data (Heckman, 1981). The actual dependence of the state is likely to be overestimated if the potential endogeneity of the result in the first period is ignored (Chay and Hyslop, 2014). The dynamic probit random effects model proposed by Wooldridge (2005) incorporates the individual's own effect. This estimator models the unobserved heterogeneity as a function of the initial condition of the individual's own explanatory variables and the random error not correlated with the initial condition.

The results of the Wooldridge estimator suggest that a moderate part of the observed persistence can be attributed to a true state dependence effect. Previous experience with overqualification has a significant, but small, behavioural effect on future overqualification, i.e. 3 percentage points. In addition, the results suggest that unobserved factors are the main factor behind the strong persistence of overqualification at the beginning of graduates' careers.

### 2.1.2 Model

The econometric model can be summarized as follows: consider  $y_{it}^*$  as the latent propensity per individual  $i$  to be overqualified at time  $t$ . The latent propensity depends on the overqualification experience previously performed  $y_{i,t-1}$ . The individual's observable explanatory variables are summarized in  $x_{it}$ . captures the  $\mu_i$  individual's unobservable variables that are invariant over time. An individual is overqualified, i.e. if he  $y_{it} = 1$   $y_{it}^*$  exceeds a constant threshold that is assumed to be zero. The model is given by:

$$y_{it}^* = \gamma y_{i,t-1} + x_{it}\beta + \mu_i + \varepsilon_{it} \tag{1}$$

$$i = 1, \dots, N \text{ and } t = 1, \dots, T$$

$$y_{it} = I[y_{it}^* > 0] \tag{2}$$

$\varepsilon_{it}$  represents the error term. It is assumed that  $\varepsilon_{it} | y_{i1}, \dots, y_{i,t-1}, x_i$  is *independently and identically distributed (i.i.d.)* as and  $N(0,1)$  with  $\varepsilon_{it} \perp (y_{i1}, x_i, \mu_i)$   $x_i = (x_{i2}, \dots, x_{iT})$ .

In such a model, the coefficient of the lagged dependent variable,  $\gamma$ , is interpreted as a measure of structural dependence or real state (Heckman, 1981). The "false" dependence of the state due to permanent unobserved heterogeneity is explained by the term (constant individual specific characteristics  $\mu_i$ ). In this study, this term can be interpreted as referring to differences in people's unobserved ability or preferences for particular job characteristics.

The estimation of this model requires taking into account the problem of initial conditions. It is caused by the presence and correlation between the past value of the dependent variable and the heterogeneity term not observed in the equation. Treating the initial conditions as exogenous would lead to an overestimation of the real dependence effect if the initial conditions are correlated with ( $\mu_i$  Chay and Hyslop, 2014). In order to integrate the individual specific effect, its relationship with the result of the initial  $y_{i1}$  period should be specified. As Wooldridge (2005) suggests, one possibility is to assume that  $y_{i1}$  is random and specify the distribution of conditional to  $\mu_i$  and  $y_{i1}x_i$  which leads to the density of the joints of  $(y_{i2}, \dots, y_{iT}) | y_{i1}, x_i$ . Following this estimation strategy, it is assumed that the individual specific effect depends on the initial condition and strictly exogenous variables as follows:

$$\mu_i = \alpha_0 + \alpha_1 y_{i1} + \bar{x}_i \alpha_2 + a_i \tag{3}$$

The inclusion of time averages of observed explanatory variables  $\bar{x}_i = \frac{1}{T-1} \sum_{t=2}^T x_{it}$  explains the potential correlation between unobserved heterogeneity and the time-varying variable that takes into account the potential correlation between unobserved heterogeneity and time-varying explanatory variables, as suggested by correlated random effects models (Chamberlain, 1984; Mundlak, 1978). In this type of random effects models, it is possible to estimate the effect of a change in  $x_{it}$  by maintaining fixed time averages. It is assumed that the error  $a_i$  term is i.i.d. as and  $N(0, \sigma_a^2)$  that  $a_i \perp (y_{i1}, \bar{x}_i)$ . Thus, the distribution of individual heterogeneity is as follows:

$$\mu_i(y_{i1}, \bar{x}_i) \sim N(\alpha_0 + \alpha_1 y_{i1} + \bar{x}_i \alpha_2, \sigma_a^2) \tag{4}$$

Under these conditions, the probability of overqualification is given by:

$$P(y_{it} = 1 | y_{i1}, \dots, y_{i,t-1}, x_i, a_i) = \Phi(\gamma y_{i,t-1} + x_{it} \beta + \alpha_0 + \alpha_1 y_{i1} + \bar{x}_i \alpha_2 + a_i) \tag{5}$$

As Wooldridge (2005) shows, the integration  $a_i$  produces a likelihood function with the same structure as in the standard random effects model, including the initial condition  $y_{i1}$  and time average  $\bar{x}_i$  as additional explanatory variables in each period  $t$ . By integrating the augmented set of explanatory variables, standard random-effect probit estimation methods can be used to estimate  $\gamma \beta \dots \alpha_0 \dots \alpha_1$ , and  $\alpha_2 \sigma_a^2$ .

If it is estimated that is  $\gamma$  significantly greater than zero, there is a real dependence on the condition such that previous overqualification experience increases the probability of being overqualified in the following period. However, due to the non-linearity of the model, the magnitude of the condition dependence effect cannot be measured directly from the estimated coefficients. Therefore, the Average Partial Effect of the delayed dependent variable is calculated to assess the degree of actual dependence. The fact that individual heterogeneity is not observed is problematic for the estimation of partial effects. One way to overcome this problem is to estimate the average partial effect by assuming that individual heterogeneity  $\mu_i$  takes its average value.  $E(\mu_i) = \alpha_0 + \alpha_1 E(y_{i1}) + E(\bar{x}_i) \alpha_2$  and can be estimated consistently by  $\bar{E}(\mu_i) = \hat{\alpha}_0 + \hat{\alpha}_1 \bar{y}_1 + \bar{x} \hat{\alpha}_2$  where and  $\bar{y}_1 = \frac{N}{\sum_{i=1}^N} y_{i1}$   $\bar{x} = \frac{N}{\sum_{i=1}^N} \bar{x}_i$ .

The mean partial effect for the binary delayed dependent variable (overqualification in t-1) can be calculated as the discrete change in the probability of being overqualified when the dummy variable changes from 0 to 1:

$$\text{Mean partial effect} = \Phi[\hat{\gamma} + x_i \hat{\beta} + \hat{\alpha}_0 + \hat{\alpha}_1 \bar{y}_1 + \bar{x} \hat{\alpha}_2] - \Phi[x_i \hat{\beta} + \hat{\alpha}_0 + \hat{\alpha}_1 \bar{y}_1 + \bar{x} \hat{\alpha}_2] \tag{6}$$

Capture of unobserved heterogeneity components

The unobserved heterogeneity should be entered by ( $\alpha_1 y_{i1}$  initial period of the response variable) and ( $\bar{x}_i \alpha_2$  mean of the explanatory variables varying over time). Based on these variables, we can express unobserved heterogeneity (UH) as:

$$UH = UH_y + UH_x \tag{7}$$

where the first and second terms on the right side of the equation refer to the unobserved heterogeneity of the response variable and the explanatory variables respectively.

Here, instead of considering a global distribution of unobserved heterogeneity, we distinguish the two components in such a way that:

$$UH_x = \bar{x}_i \alpha_2 \tag{8}$$

$$UH_y = \begin{cases} y_{i1}=1 \\ y_{i1}=0 \end{cases} \tag{9}$$

On the basis of these considerations, we jointly assess the role of true state dependence at different levels  $UH_y$  and quantiles of distribution  $UH_x$ . This makes it possible to compare exposure to the risk of overqualification and the true extent of state dependence among graduates at the same relative position in the distribution  $UH_x$ , but with different initial conditions with respect to the dependent variable  $UH_y$ .

## 2.2 Data

To carry out this study, we mobilized the survey on the Sources of the Skills-Employment Mismatch (SSEM) financed by the French Development Agency (FDA) and carried out by CREMIDE<sup>3</sup> in 2018.

SSEM concerned a sample of 7500 graduates drawn as part of a study on the future of graduates of general, technical and vocational education and higher education promotion "2008-2009". This sample of 7,500 graduates constituted for us the population of graduates from which 2,000 graduates were randomly selected. Out of the 2000 graduates, 1440 graduates could be contacted by phone initially and then 974 graduates agreed to submit to our questionnaire. The investigation took place from 8 January to 28 March 2018 in Abidjan.

The particularity of this database is that it includes interviews with graduates two years after their graduation. In addition to the socio-demographic characteristics of the respondents, respondents are asked about the relationship between the qualification requirements of the jobs they held from 2011 to 2017 and the qualifications they acquired in their different basic training. These interviews, which are based on data from individual panels, will be used for econometric estimates. In total, we have a sample of 6818 observations.

## Section 3: Results

In this section, descriptive statistics and econometric results will be presented.

### 3.1 Descriptive statistics

Overqualification decreased from 2011 to 2017 by 2.81 percentage points from 38.38% to 35.57%. This graph shows that the transition from overqualification to adequacy is very small. The largest decrease occurred in 2015 (34.52%). This can be justified by the fact that it was in 2015 that the Ivorian State reformed the public labour placement agency by transforming the former AGEPE into a Youth Employment Agency. To this end, the Ivorian government has created a Ministry of Youth and Youth Employment.

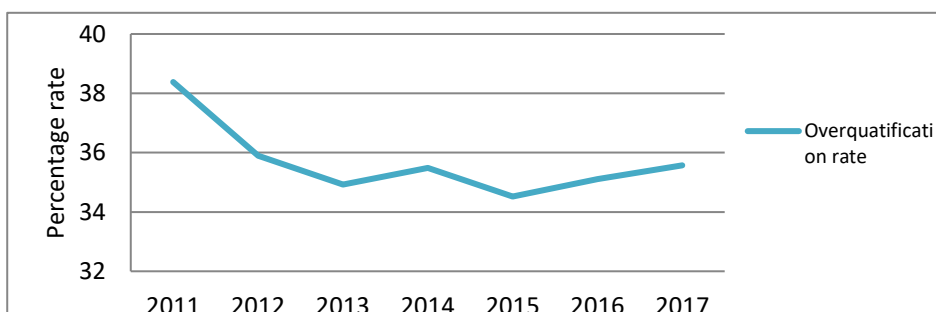


Figure 1. Evolution of the overqualification rate in Côte d'Ivoire

Source: SSEM, CREMIDE 2018 Survey.

<sup>3</sup> Microeconomic Research Centre for Development.

The probability of being overqualified at the beginning of a career is 16.52%. Among graduates who were overqualified at the beginning of their careers (t=2011), 62.78% managed to find suitable employment at the end of the period (t=2017), while 37.22% of these graduates remained stuck in overqualified jobs.

Table 1 shows the transition rates from overqualification to overqualification by observable sub-characteristics of workers.

Table 1. Transition rate of overqualification

Variables	Terms and conditions	Entry rate* in %.	Exit rate** in %.	Transition period in years
Gender	Woman	10,8	69,8	1,43
	Man	18,8	60	1,66
Last one degree	BTS/DEUG/DUT	14,1	67	1,49
	Master_License	21,2	56,7	1,76
	Engineer and more	16,2	64	1,55
Training programs	University programs	15,6	64,2	1,55
	Technical and professional fields	27,8	42,4	2,36
Situation Matrimonial	Single_other	16,3	63,3	1,58
	Common-law union	17,5	61,6	1,62
	Married	16	63,6	1,57
Type of contract	Permanent contract	23,3	56,8	1,76
	Fixed-term contract	10,6	71,2	1,41
	Verbal agreement	16,1	66,7	1,50
Size of the company	Very small companies	19,2	59,1	1,69
	Small Businesses	18,8	59,6	1,69
	Medium-sized companies	16,4	63	1,59
	Large companies	10,2	70	1,43

Source: SSEM, CREMIDE 2018 Survey.

Notes: \*Rate of entry into overqualification at the beginning of a career. \*\*Rate of exit from overqualification at the end of the period.

The rate of overqualification at the beginning of a career and the average length of transition to adequate employment are higher for men than for women. This may be justified by the fact that as the man is the head of the family, he is more risk-taking.

The rate of overqualification and the average length of transition to suitable employment are lower among second-year university graduates and grandes écoles (BTS, DEUG, DUT) and higher among bachelor's and master's graduates. BTS graduates leave the training system with qualifications, which is not the case for bachelor's and master's graduates. When the analysis is done according to training streams, graduates of technical and vocational streams are most exposed to the risk of over-qualification at the beginning of their careers. The justification is that graduates from these training courses generally enter the informal sector at the beginning of their careers due to a lack of professional experience.

As for stratification by firm size, the larger the firm, the lower the risk of overqualification and the higher the transition rate to adequate employment, because compared to small firms, large firms offer skilled jobs and more opportunities for promotion.

The descriptive statistics presented in this subsection show a weak transition of overqualified graduates at the beginning of their careers to suitable jobs. The econometric results presented in the next subsection will confirm or falsify the results of the descriptive statistics.

### 3.2 Econometric results

This subsection presents the empirical results of the study. As a starting point, the first part of this subsection provides the results of a simple dynamic probit model that takes into account only the observed heterogeneity. The second part of this subsection presents the main results of the dynamic random effects probit model, taking into account initial state selection and unobserved heterogeneity.



### 3.2.1 Simple dynamic probit model

Table 2 presents the results of a simple dynamic probit model.

Table 2. Simple dynamic probit results

Variable	Terms and conditions	(1)	Estim out of q	(2)
Overq L.1		4,087***(0,246)		-----
Age	Age	-0,142 (0,318)		0,0457 (0,407)
	Age_2	0,00161 (0,00499)		-0,000378 (0,00657)
Gender	Woman	ref		Ref
	Man	0,126 (0,246)		0,0867 (0,299)
Last diploma	BTS/DEUG/DUT	ref		Ref
	Master_License	0,273 (0,256)		0,666* (0,392)
	Engineer_plus	0,0323 (0,254)		0,269 (0,396)
Training programs	University programs	ref		Ref
	Technical and professional fields	0,229 (0,374)		1,000***(0,355)
Type of contract	Permanent contract	ref		Ref
	Fixed-term contract	-0,579**(0,253)		0,652**(0,313)
	Verbal agreement	-0,284 (0,316)		0,783**(0,363)
Size of the company	Very small companies	ref		Ref
	Small Businesses	-0,296 (0,312)		-0,342 (0,346)
	Medium-sized companies	-0,275 (0,323)		-0,553 (0,370)
	Large companies	-0,484 (0,365)		-0,291 (0,425)
Matrimonial situation	Single_other	ref		Ref
	Common-law union	0,335 (0,248)		-0,279 (0,342)
	Married	-0,0582 (0,307)		-0,181 (0,493)
Number of children	Number of_children	0,0555 (0,131)		-0,203 (0,228)
Constant		0,446 (5,115)		-2,810 (6,342)
$\sigma$		0,000000241 (0,000079)		4,076 (0,729)
$\rho$		0,0004909 (0,0804)		0,943 (0,019)
Log. Lik.		-91,69293		-267,44266
LR test of rho=0		chibar2(01) = 0.00 Prob >= chibar2 = 1,000		chibar2(01) = 724.33 Prob >= chibar2 = 0.000
Observations		877		1108
Number of id		264		300

Source: SSEM, CREMIDE 2018 Survey.

Notes: \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Standard errors in parentheses.

The test of rho=0 indicates that the variance component of the panel is unimportant and the panel estimator is no different from the group estimator.

Table 2 shows that previous overqualification has a strong influence on future overqualification. This result allows us to conclude that the overqualification of graduates in the labour market in Côte d'Ivoire persists, a result that is in line with Thurow's (1972) competition-employment theory. The study's hypothesis of considering overqualification as a transitory phenomenon is falsified. This is justified by the fact that individuals acquire a high level of education in order to obtain the best possible job in the queue of job offers. People may be permanently employed in low-demanding jobs due to lower levels of human capital compared to people with the same level of education (Verhaest and Velden, 2012; Baert, Cockx and Verhaest, 2013; Erdsiek, 2017).

The type of contract influences the dynamics of overqualification. Compared to groups of graduates with permanent contracts, having a fixed-term contract reduces the persistence of overqualification. CDD promotes upward internal mobility of the worker.

The simple dynamic probit model only takes into account the observed heterogeneity. It does not observe unobserved heterogeneity, which could lead to an overestimation of the effects of state dependence, i.e. an

overestimation of the influence of previous overqualification on future overqualification. To have a very relevant result, it is therefore important to choose a model that takes into account the observed and unobserved heterogeneity.

### 3.2.2 Dynamic probit random effects model with unobserved heterogeneity correction

Table 3 presents the main results of the dynamic probit random effects model, taking into account initial state selection and unobserved heterogeneity.

Table 3. Results of the wooldridge estimator of the dynamic random effects probit

Variable	Terms and conditions	Estimated overq
1L.surq	1L.overq	2,539***(0,501)
Age	age	-0,267 (0,667)
	age_2	0,00570 (0,0106)
Gender	Woman	Ref
	Man	1,003*(0,592)
Last diploma	Engineer_plus	Ref
	BTS/DEUG/DUT	-0,271 (0,530)
	Master_License	0,648 (0,531)
Training programs	University courses	Ref
	Technical and professional fields	1,552*(0,871)
Type of contract	Permanent contract	Ref
	Fixed-term contract	-1,636***(0,613)
	Verbal agreement	-0,952 (0,691)
Size of the company	Very small companies	Ref
	Small Businesses	-0,0431 (0,594)
	Medium-sized companies	-0,343 (0,636)
	Large companies	-1,130 (0,757)
Matrimonial situation	Single_other_other	
	Common-law union	0,151 (1,489)
	Married	-0,0336 (2,000)
Number of children	numb_children	-0,108 (0,791)
	1.overq_0	5,079***(1,764)
	Free_Union_0	-0,126 (1,414)
	Married_0	-1,776 (1,730)
	age_0	-0,224 (0,226)
	numb_children_0	0,00342 (0,989)
	m_free_union	0,359 (2,282)
	m_married	0,446 (2,956)
	m_age	-0,0346 (0,286)
	m_number_child	0,324 (1,383)
	Constant	4,562 (10,83)
	var(_cons[id])	1,043(0,969)
	Log. Lik.	-63,826169
	LR test vs. probit model	chibar2(01) = 3.68      Prob >= chibar2 = 0.0275
	Observations	877
	Number of groups	264

Source: SSEM, CREMIDE 2018 Survey. \*\*\* p<0.01, \*\* p<0.05, \* p<0.1 Standard errors in parentheses.

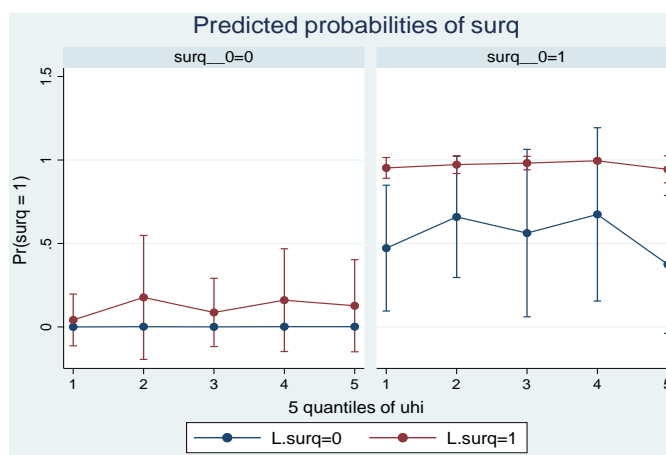
According to the results in Table 3, the average partial effect of the delayed overqualification experience is significant at 253.9 percentage points. This means that after taking into account observed and unobserved characteristics, graduates are on average 253.9 percentage points more likely to be overqualified at time t if they have already been overqualified at t-1. This result confirms that of Table 2 (408.7 percentage points).

However, the magnitude of the causal effect of previous overqualification experience is lower when observed and unobserved heterogeneity is taken into account.

The results suggest that variables capturing unobserved heterogeneity have no effect on the risk of overqualification of graduates. Unobserved factors do not increase the persistence of overqualification during the initial career of graduates in Côte d'Ivoire.

The effect of the initial condition, i.e. the risk of overqualification at the beginning of the career ( $t=2011$ ), is very significant (507.9 percentage points) and much larger than the effect of the delayed dependent variable. Most of the observed persistence of overqualification is due to initial selection at the risk of overqualification at the beginning of the career.

Figure 2 shows the variation in the risk of overqualification under two scenarios  $UH_y$  and  $UH_x$ .



**Figure 2.** Change in the real dependence of the state on the distribution of unobserved heterogeneity components

Source: SSEM, CREMIDE 2018 Survey.

Figure 2 indicates that the initial condition ( $surq\_0=0$  and  $surq\_0=1$ , in the left and right subgraphs, respectively) represented by  $UH_y$  and the relative individual position in the sample distribution ( $UH_x$  defined, in each subgraph, by the 5 quantiles) have a significant effect on the model predictions. By comparing the left and right subgraphs, we find that individuals reporting overqualification experiences at the beginning of the period appear to be more exposed to periods of future overqualification. This is verified regardless of their relative position in relation to  $UH_x$ .

As we progress in the distribution of  $UH_x$  exposure to overqualification risk, we see an increase in the risk of overqualification, indicating the independent relevance of the formation of overqualification risks over time. The same is true for the marginal effect of the real dependence of the state, represented in Figure 2 by the difference between the two lines  $surq\_0=0$  and  $surq\_0=1$ . Indeed, in each sub-region, the real dependency of the state tends to be higher for those who are already overqualified at the beginning of the period ( $overq\_0=1$ ). This result can be conceptualized as a kind of interaction between a true dependence on the state  $UH_y$ , and since for those who have initial experience of overqualification in each subsequent period, overqualification is more likely to be repeated or prolonged than for those who do not declare themselves overqualified at the beginning of the period ( $surq\_0=0$ ).

## Conclusion

In this study, the aim was to analyse the dynamic characteristics of overqualification at the beginning of the career of graduates on the labour market in Côte d'Ivoire. The empirical analysis was carried out using panel data from 974 graduates leaving the education system in 2009. The interviews with graduates focused on their professional background over the period 2011-2017, two years after graduation.

The study shows that overqualification is very persistent among most graduates in the labour market in Côte d'Ivoire. In addition, the probability of being overqualified at the beginning of the period is 16.52%. Among overqualified graduates at the beginning of the period, 62.78% managed to find suitable employment before the end of the study period, while 37.22% of graduates remain trapped in overqualified jobs.

Empirical analysis indicates that the probability of being overqualified is 253.9 percentage points higher for graduates who have already been overqualified a year earlier. This probability is 507.9 percentage points, or twice as high, for graduates who were overqualified at the beginning of the period. Taking into account observable explanatory variables shows that signing a fixed-term contract reduces the probability of being overqualified by 163.6 percentage points.

The experience of previous overqualification and overqualification at the beginning of the period strongly explain the risk of future overqualification. Graduates who accept overqualified jobs at the beginning of the period in order to gain work experience and subsequently migrate to suitable jobs remain trapped in these overqualified jobs. In this case, the diploma would be a means of entering the queue for vacant jobs.

To reduce overqualification, governments must put in place policies to help graduates leaving the education system gain work experience and improve the quality of information on job vacancies in the labour market. As a policy, strengthening the training-school-enterprise system, popularizing internship programmes for first-time job seekers, creating a structure to deal with information on job vacancies and timely job opportunities would promote a better matching of graduates on the labour market.

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