

Entrepreneurship and Growth of Entrepreneurial Firms in Côte d'Ivoire

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This article analyses the determinants of individuals' choice for self-employment and entrepreneurial success in Côte d'Ivoire. Entrepreneurial activity is found to be undertaken by individuals who succeed in increasing their entrepreneurial abilities and reducing the risk of starting a business through a learning process that takes place through ageing, professional experience, and apprenticeship or, alternatively, formal education. The learning process takes place both before and after entry into the industry, as firms grow into a larger size. However, financial constraints continue to play a major restraining role for entrepreneurship and firm growth.

I. INTRODUCTION

Entrepreneurship in developing countries has recently gained new attention in academic research. Public interest in this topic is high, as entrepreneurship is found to play an important role in economic development. The massive failure of state owned enterprises (SOEs) in generating development has resuscitated the interest in the private sector, both modern and informal. The creation of small firms, and their subsequent growth, are considered essential for the establishment of a solid industrial base.

This study addresses two key aspects of entrepreneurship: it investigates the characteristics that distinguish entrepreneurs from wage workers and it examines the determinants of growth of entrepreneurial firms. The point of departure is the unique data set gathered in the framework of the World Bank project RPED ('Regional Program on

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Enterprise Development in Africa') executed in Côte d'Ivoire in 1995 and 1996. The data set contains data on the socio-economic and personal characteristics of over one thousand individuals, either entrepreneurs or employees, working in the manufacturing sector in Côte d'Ivoire in 1995. The data set allows us to model the factors that determine whether an individual chooses to be self-employed, or prefers to work as an employee. Furthermore historical sales data are available for the entrepreneurs' firms. This allows an analysis of sales growth in relation to firm-specific and entrepreneur-related factors.

The structure of the article is as follows. Section II develops an occupational choice model including factors which affect an individual's inclination to start up a business. Section III presents the data. Section IV subsequently tests the theoretical implications and analyses the distinguishing features of entrepreneurs in the Côte d'Ivoire manufacturing sector. The determinants of firm growth are discussed in section V and tested against firm-level data in section VI. Section VII concludes.

II. THE DECISION TO BECOME AN ENTREPRENEUR

Several theoretical models have been developed to highlight the motivational factors involved in an individual's occupational decision. Expected entrepreneurial profit or, alternatively, wages and managerial or working skills, are the main factors advanced in these models. However, underdeveloped credit markets can install serious barriers to entrepreneurial initiatives. Empirical research in several disciplines has also shown that the decision to become an entrepreneur is severely affected by the socio-economic environment and is subject to both cultural and psychological factors.

Occupational Choice and Entrepreneurship

The decision to become an entrepreneur has been studied within the framework of occupational choice models [Lucas, 1978; Oi, 1983; Blanchflower and Oswald, 1990; Jovanovic, 1994], in which individuals compare the wage they can earn with the entrepreneurial rent they can obtain by managing their own business. The rent which entrepreneurs can create depends on their managerial abilities, which are unequally distributed over the population.

In their most basic form these models predict that the individual's propensity to become self-employed is positively influenced by his/her managerial abilities and negatively by the expected wages he could earn as a worker. Persons who are endowed with higher levels of managerial ability would be more likely to become entrepreneurs. Whether this outcome

occurs may however depend on the correlation between managerial skills and the associated wage structure.²

A complementary approach to the occupational choice is developed by the models of learning, which stress the existence of uncertainty and informational shortages related to the individual's occupational decision [Jovanovic, 1982; Dosi et al., 1993; Pakes and Ericson, 1990]. They assume that individuals enter into self-employment without a priori knowledge about their true managerial efficiency and hence their entrepreneurial income. Once established in the industry they discover their level of managerial efficiency and related entrepreneurial income in a 'Bayesian' learning process. The learning process is responsible for growth or exit of firms over time as the managers discover that their efficiency level is higher, or lower, than initially estimated.

The occupational decision therefore does not only depend on the expected level of compensation related to both alternative occupations. It is also affected by the degree of uncertainty related to the alternative occupations³ and on the individual's attitude towards risk bearing. Formally, the decision to become entrepreneur will be governed by the following rule.⁴

$$\bar{p} - \frac{1}{2} r(\bar{p}) \text{var}(p) > = \bar{w} - \frac{1}{2} r(\bar{w}) \text{var}(w) \quad (1)$$

where \bar{p} and \bar{w} are respectively the expected entrepreneurial rent if self employed, and the expected wage if the individual decides to work as a wage worker. $\text{Var}(p)$ and $\text{var}(w)$ are the variance of the distribution of entrepreneurial rents and wages and $r(\cdot)$ stands for the coefficient of absolute risk aversion.⁵ An individual's degree of risk aversion is strongly affected by his personal characteristics, his psychological profile as well as by the sociological and cultural environment which affect his attitude towards risk bearing.

The variance of the distribution of entrepreneurial profit can be sensibly reduced through the acquisition of *ex ante* knowledge. In this way, working experience in the industry, apprenticeships or an entrepreneurial family tradition sharply increase an individual's ability to make correct guesses about his post-entry managerial efficiency and expected profit. *Ex-ante* learning thus reduces considerably the risk of starting a venture and enhances an individual's propensity to start up a business. Besides their effect on the variance of the distribution of profits, they may also affect the expected level of the entrepreneurial rents.

In empirical studies human capital and managerial ability are proxied by formal education, age, labour market experience and experience in self-employment. Empirical studies on entrepreneurship in developing countries indicate a higher level of formal education among entrepreneurs than for the

population as a whole. A direct relationship is found between formal education and success of the entrepreneur [*Nafziger, 1988*].

However, for younger individuals formal education and working experience are to some extent alternatives for acquiring skills. This is especially the case for craftsmen, whose training requires a lengthy apprenticeship. Apprenticeship arrangements are important in Africa because they provide training in specific occupations that are in demand and allow the apprentice to acquire the whole range of skills necessary to copy independently and successfully the activities of the master.

Finally, the individual's decision may be strongly affected by the characteristics and opportunities of the sector in which s/he wants to operate. Both wages and expected profits may be subject to sectoral variation, as well as barriers to enter the sector.

II. BARRIERS TO ENTREPRENEURSHIP AND FIRM GROWTH

Not all individuals willing and capable of starting up a business have the possibility of doing so. Insufficient capital to start up a business or to expand activities is among the most important economic barriers to small firm development. Recent empirical findings suggest that capital markets discriminate against individual entrepreneurs and entrepreneurial firms and they point at the role of personal and informal financing, implying that the entrepreneur takes the risk of his venture. Evans and Leighton [*1989*] find that switches from wage employment to self-employment are more likely if the individual disposes of more assets. In a similar view Evans and Jovanovic [*1989*], Blanchflower and Oswald [*1990*], van Praag and van Ophem [*1994*] and Holtz-Eakin *et al.* [*1994a, 1994b*] find empirical support for binding liquidity constraints using US or UK data.

However, the effect of financial assets found in some of these studies is questioned by Cressy [*1996*] who finds that the effect of individual's assets vanishes when human capital of the owner(s) is controlled for. The correlation between human capital factors and assets, and the failure to test a sufficiently rich model including human capital variables such as age, experience, education and vocational qualifications, may create the false impression that startups are finance constrained. Both rival theories have different policy implications, the first theory of credit rationing calling for adapted credit schemes for candidate entrepreneurs while the latter theory requires higher skill levels of prospective entrepreneurs as preconditions for entry.

In developing countries the general tendency seems to be that financial constraints are widely recognised as obstacles to business startups. Credit markets are relatively underdeveloped and transaction costs in formal

financial markets are very high, especially for small and medium sized enterprises. Most entrepreneurs finance their venture with their own savings and they bear the risk of their activities themselves. A description of the importance of informal financing methods in Côte d'Ivoire is provided by Lelart [1995].

Besides financial considerations, social and psychological factors can influence an individual's propensity to start up a business in many ways. The gender factor has increasingly received attention. Despite a number of exceptions, only a small proportion of entrepreneurs in manufacturing are women. Very often, cultural norms impose restrictions on the possibilities of women becoming self-employed in developing countries [Stevenson, 1988]. Nevertheless, some authors claim that women do possess a number of characteristics that can give them an entrepreneurial advantage over men [Peterson and Weiermair, 1988].

According to Kilby [1983] alien minorities have an entrepreneurial advantage. In a similar view Elkan [1988] argues that entrepreneurial talent is often generated by ethnic or religious minorities. The mere fact of belonging to a minority may create a feeling of insecurity which encourages people to seek economic success.

Many other cultural and sociological factors can interact in the decision process of the individual. Shapero and Sokol [1982] stressed 'displacement' as a sociological factor for entrepreneurship. Among the psychological factors the most frequently mentioned are the locus of control,⁶ the need for achievement [McClelland, 1961] and the attitude towards risk. As entrepreneurship involves important risk-bearing, less risk averse individuals are found to be more likely to start up a business. The predictions following from the foregoing theoretical considerations will be tested against a data set on entrepreneurship in Côte d'Ivoire.

III. THE DATA

The data for the empirical analysis were gathered in the framework of the 'Regional Program on Enterprise Development in Africa (RPED)', a project coordinated by the World Bank and executed in Côte d'Ivoire in March–May 1995.⁷ The objective of the project was to create an extensive firm-level data base with information on performance of manufacturing firms, as well as information on several aspects of the business environment, including the labour market. The data were collected through intensive interviews with owners or managers of 230 manufacturing firms and with employees working in these firms.

In the sampling procedure, the main objective was to have a sample that represents the entire spectrum of firms active in manufacturing. Therefore,

while most studies concentrate on formal sector firms, a representative number of firms with a less formal status was selected, given its estimated importance in manufacturing. An indication of the population of formal firms was provided by the 'Répertoire Pilote' of the National Institute of Statistics (INS),⁸ a census providing a list of 4464 firms with normal or simplified accounting records of which 954 firms (21.4 per cent) are operating in industry. Besides this group of firms, an important number of firms do not keep formal records and pay at most the local business licence tax, called '*patente*'. They are defined here as informal firms and do not appear in the INS census. The informal sample firms have therefore been randomly selected from local tax lists. A third relatively small group of firms defines themselves as 'semi-formal',⁹ based on adherence to a specific union. The semi-formal firms are randomly selected from the list of union members.

From the total population of firms active in manufacturing, firms were selected from the four main manufacturing sectors: agro-industries, including food processing and beverages, textiles and clothing, wood working and metal working.¹⁰ Taken together these sectors account for 43 per cent of all formal firms active in industry, including manufacturing.

The resulting sample of firms surveyed is characterised by a strong heterogeneity, both in terms of size and age of firms, legal and formal status and ownership structure. Of the initial sample of 230 firms surveyed, 141 firms are entrepreneurial firms, being managed by the owner(s). This subsample is used here in the empirical analysis. The size distribution of these firms is presented in Table 1.

The industrial sector is characterised by a strong geographical concentration in the region of Abidjan. More than three-quarters of all firms of the INS census are located there. The second and third largest core regions are Bouaké and San Pedro. However, they account for only 2.9 per cent and 2.0 per cent of the firms of the INS census. This concentration also reflected in the sample of entrepreneurial firms, of which 126 are located in Abidjan, eight in San Pedro, four in Bouaké, and 3 in other urban regions in the country.

The Côte d'Ivoire economy is also characterised by strong foreign presence as a result of former 'open door' policies aimed at attracting foreign direct investment. This can also be seen from the sample when firms are classified according to the origin of the majority equity capital. About 25 per cent of the sample firms are owned by non-Ivorian Africans from neighbouring countries, 19 per cent of the firms are European owned, while seven per cent are Asian owned. This latter group includes an important representation of Lebanese entrepreneurs.

TABLE I
 SIZE DISTRIBUTION OF ENTREPRENEURIAL FIRMS BY PERIOD OF STARTUP,
 SECTOR, ORIGIN OF EQUITY CAPITAL, FORMAL STATUS AND GENDER

	Number of firms	1-4	5-49	50-99	100-249	250+	Average employment
All firms	141	47	67	16	5	6	43
Established in:							
1952-69	10	1	5	1	1	2	167
1970-79	27	5	12	4	3	3	86
1980-1986	35	9	20	4	1	1	33
1987-95	69	32	30	7	0	0	15
Sector :							
Agro-industries	22	0	17	2	2	1	40
Textiles	48	25	17	5	0	1	34
Wood working	42	18	14	4	3	3	62
Metal working	29	4	19	5	0	1	34
Origin of equity capital:							
Ivorian	69	23	36	6	3	1	23
Other African	35	23	11	1	0	0	8
European	27	0	15	6	2	4	138
Asian	10	1	5	3	0	1	54
Formal status							
Informal	52	41	11	0	0	0	3
Semi-formal	22	5	17	0	0	0	9
Formal	67	1	39	16	5	6	86
By gender							
Male	129	41	62	16	4	6	46
Female	12	6	5	0	1	0	19

IV. WHO ARE THE ENTREPRENEURS: AN EMPIRICAL MODEL

The RPED survey collected data on human capital, gender, ethnic origin and personal wealth of 133 entrepreneurs and 804 employees active in the manufacturing sector in Côte d'Ivoire. These data are pooled into one data set to identify the characteristics which distinguish individuals in their choice of being an entrepreneur versus a wage workers.¹¹ The occupational choice of individuals is modelled following a logit model which relates the probability of being an entrepreneur to the characteristics of the individual and his expected wage:

$$Pr(ENTR_i) = \frac{\exp(a + bX_i + gW_i)}{1 + \exp(a + bX_i + gW_i)} \tag{2}$$

where X_i is a vector with relevant personal characteristics. These include an extensive set of human capital variables, as well as gender, ethnic origin, sector of activity and financial status of the person to test for rival theories about the effect of financial constraints on startups. The variable W_i is the expected wage to assess the effect of the opportunity costs on the choice of being an entrepreneur (cfr. occupational choice models, section II). The expected wage is estimated following a wage equation relating wages to characteristics of individuals, including age, gender, ethnic origin, education, training and working experience, and sector of activity (see appendix).

In line with previous empirical studies [Cressy, 1996, among others], the human capital of the entrepreneur is measured by age, formal education, professional experience and apprenticeship. Age is measured in logarithmic terms (LAGE). Three mutually exclusive binary variables capture the effect of formal education: PRIMARY, equalling one if the individual's highest degree obtained is a certificate of primary school, SECONDARY equalling one if the individual has a certificate of technical or classical secondary school, and HIGHEDEC, equalling one if the individual has obtained a university or equivalent degree in Côte d'Ivoire or abroad or if he has obtained a certificate of advanced technical school. Professional experience is captured by a binary variable equalling one if the individual has previously acquired experience in the same industry of his current activities (EXPER). Technical and vocational qualifications acquired through a former apprenticeship are captured by the binary variable APPR.

Formal education and apprenticeships are often viewed as an alternative way to acquire basic skills. To test for the simultaneous effect of formal education and apprenticeships, three variables are included to assess the interaction between lower levels of education and apprenticeships. NOEDUCAP equals one if the individual has received no formal education but has been apprentice. PRIMAPPR equals one for individuals who have attended primary school and have been apprentice, while SECAPPR equals one if the person has attended secondary school and has been apprentice. Apprenticeships are rare among the individuals who have received higher formal education.

Measuring personal wealth in the context of African communities is not straightforward. As minimal indication for personal wealth a binary variable (WEALTH) is constructed equal to one if the individual possesses real estate, transport vehicles or other assets or is not in financial need as revealed through the need for prepayment of their salary and other personal loans.

To measure the sociological effects of gender and ethnicity on the probability of being an entrepreneur the binary variables FEMALE and NONAFR are included, equalling one if the individual is female, respectively a foreigner of non-African origin.

Finally, three sectoral binary variables, FOOD, WOOD, METAL, are included to assess sectoral effects on the incidence of entrepreneurship. They equal one if the person is active in agro-industries, woodworking, respectively metalworking, the reference group being individuals working in the textiles sector. Table 2 shows the sample mean values for the variables included in the model.

TABLE 2
SUMMARY STATISTICS

Variables	Non-Africans N=53	Africans N=884	Total sample N=937
Entrepreneur	0.7170	0.1075	0.1419
LAGE	3.7871	3.5350	3.5492
EXPER	0.6415	0.3631	0.3789
APPR	0.2075	0.4774	0.4621
PRIMARY	0.0943	0.3529	0.3383
SECONDARY	0.4528	0.2387	0.2508
HIGHEDUC	0.3774	0.0713	0.0886
NOEDUCAP	0.0566	0.2093	0.2006
PRIMAPPR	0.0000	0.1855	0.1750
SECAPPR	0.1132	0.0690	0.0715
WEALTH	0.9623	0.4943	0.5208
FEMALE	0.0377	0.0984	0.0950
NONAFR	1.0000	0.0000	0.0566
LEXPWAGE	13.1015	11.2465	11.3515
FOOD	0.1887	0.2658	0.2615
WOOD	0.3208	0.3054	0.3063
METAL	0.3396	0.2466	0.2519

Estimation Results

The results of the estimation are presented in Table 3. The first column presents the basic model. In the second column the analysis is refined to account for substitution between lower levels of formal education and apprenticeships.

In line with the models of occupational choice as introduced in section II, there exists a significant negative relationship between expected wages and the propensity towards entrepreneurship. The elasticity of the probability of being an entrepreneur with respect to his opportunity cost, measured as the expected wage, equals -1.55, implying that a one per cent increase in the expected wage (w) lowers the probability of entrepreneurship by about one-and-a-half per cent.

The coefficients of the variables which capture the different aspects of managerial ability are positive and significant. An individual is more likely to be an entrepreneur if he has previously acquired experience in the same

sector. A similar significant relationship is found for the variable LAGE. The elasticity calculated for this variable indicates that a one per cent increase in the age leads to a 3.02 per cent increase in the probability of being entrepreneur (respectively 3.09 per cent for the second equation).

From the variables capturing formal education and apprenticeships it becomes clear that entrepreneurship is strongly stimulated by an apprenticeship on the one hand and by formal education on the other hand. *The positive effect of education on entrepreneurship increases steadily with higher levels of education.*

The second column unravels the interaction between lower levels of education and apprenticeships. It indicates that for those who have received no formal education at all, an apprenticeship seems to be the way to acquire experience and skills which allow and motivate the individual to become entrepreneur. By doing so, uneducated individuals might avoid the low wages paid for unskilled labour in the manufacturing sector.

For persons with some degree of formal education, an apprenticeship still increases the probability of being an entrepreneur. However, the *additional effect of the apprenticeship*, as compared to the equivalent group without apprenticeship, decreases to 1.55 and 0.44 for persons with primary and secondary schooling. For individuals with secondary school training the effect of an apprenticeship is not significant.

While mere primary education does not seem to have a significant impact on the probability of being an entrepreneur, for higher levels of education this effect increases steadily and becomes significant. Advanced education at academic or advanced technical level however seems to pay off for entrepreneurs and increases again an individual's propensity to entrepreneurship. Hence, becoming entrepreneur seems to be the best option for higher educated persons but also for individuals who have received no or little formal education but who instead got trained on the job during an apprenticeship.

While controlling extensively for different levels of human capital, the financial status still seems to have a significant impact on the occupational status. Individuals which tend to be in a more wealthy position seem to be more inclined to be entrepreneur, thereby providing supportive evidence for the existence of liquidity constraints for the startup of new firms.

The propensity towards entrepreneurship seems much larger for non-Africans in Côte d'Ivoire than for Africans. This can partly be explained by the fact that most non-African immigrants are motivated by the many opportunities to develop new businesses in Africa. However, these findings may also be related to the existence of financial constraints to the startup of a business, which seem less severe for non-Africans than for Africans. Table 4 shows the importance of own savings and help from friends and family in

TABLE 3
RESULTS OF THE LOGIT MODEL ON THE PROBABILITY OF BEING
AN ENTREPRENEUR

Dependent variable: ENTREPRENEUR		
intercept	3.41 (5.60)	3.49 (5.66)
LAGE	3.51 *** (0.65)	3.60 *** (0.65)
EXPER	1.87 *** (0.28)	1.88 *** (0.28)
APPR	1.09 *** (0.30)	-
NOEDUCAP	-	1.61 *** (0.59)
PRIMARY	0.76 ** (0.33)	0.87 (0.68)
PRIMAPPR		1.55 *** (0.48)
SECONDARY	0.98 * (0.50)	1.71 ** (0.73)
SECAPPR		0.44 (0.58)
HIGHEDUC	3.01 *** (0.67)	3.70 *** (0.82)
WEALTH	0.47 * (0.25)	0.49 * (0.25)
FEMALE	0.54 (0.41)	0.59 (0.41)
NONAFR	5.37 *** (1.06)	5.40 *** (1.06)
LEXPWAGE	-1.81 *** (0.65)	-1.89 *** (0.65)
FOOD	-0.83 ** (0.38)	-0.78 *** (0.38)
WOOD	-0.54 (0.35)	0.51 (0.35)
METAL	-0.63 * (0.38)	-0.62 (0.38)
Observations	937	937
McFadden's R ²	0.340	0.348

Note: Standard errors in parentheses; Significance levels: *** 99 per cent; ** 95 per cent; * 90 per cent.

the startup funds. These two sources are more important for small firms and African entrepreneurs and especially foreign Africans who had to rely entirely on these informal sources. African foreigners are apparently a group of people for whom access to credit is most difficult. Family and friends often act as substitute bankers, a finding which is consistent with Nafziger [1969, 1975].

TABLE 4
SOURCES OF STARTUP FUNDS BY SIZE CLASS AND ORIGIN OF
EQUITY CAPITAL

	1-4	5-49	50-99	100-249	250+	Ivorian	African	European	Asian	All firms
Own savings	78.3	79.0	91.3	79.6	56.0	77.4	76.4	86.5	83.0	79.3
Friends/family	21.7	14.5	0.0	0.0	0.0	13.6	23.6	5.8	10.0	14.3
Loan foreign bank	0.0	2.3	2.0	0.0	0.0	1.9	0.0	1.9	0.0	1.3
Loan local bank	0.0	0.3	6.7	20.4	24.0	1.8	0.0	5.8	7.0	2.5
Money lender	0.0	1.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.5
Supplier	0.0	1.5	0.0	0.0	0.0	1.5	0.0	0.0	0.0	0.7
Other	0.0	1.3	0.0	0.0	20.0	2.8	0.0	0.0	0.0	1.4

Entrepreneurship appears also significantly higher in the textiles sector than in the other sectors. In a related paper, it is found that the textiles sector is the only sector where no significant economies of scale are found, which may indicate that barriers to entry are lower in this sector as capital requirements are less strong [Sleuwaegen and Goedhuys, 1999]. Therefore, these results also provide corroborating evidence for the existence of financial constraints to startup.

The sample includes 12 female run firms against 129 male run enterprises. While female entrepreneurship in Africa is extremely important, it generally concentrates in specific sectors, mainly in services and commerce.¹² In manufacturing, female entrepreneurship is generally weak, except in the textiles sector where commonly a larger proportion of female entrepreneurs run small businesses. Therefore, the choice of industrial sectors in the analysis tends to bias in favour of an over-representation of male entrepreneurs. One should therefore expect a negative sign for the female variable in the regression. However, women

represent an equally small percentage in the sample of wage-earners, reflecting the fact that wage work by women is also very uncommon in industrial firms and limited to a few administrative functions in larger firms.¹³ Hence, controlling for other factors and accounting for the small number of women active in the manufacturing sector, women appear relatively more in entrepreneurial positions than wage-earner positions in the manufacturing sectors of the sample.

The magnitude of the effect of the different characteristics on the probability of being an entrepreneur is shown in Table 5.

TABLE 5
ENTREPRENEUR CHARACTERISTICS AND THE PROBABILITY OF BEING AN ENTREPRENEUR.

P(Entr=1) in percentages	P(Entr=1) in percentages	NONAFR	WEALTH	APPR	HIGHEDUC	EXPER
IN TEXTILES	IN AGRO- INDUSTRIES (FOOD)					
1.6	0.7	0	0	0	0	0
4.6	2.0	0	0	1	0	0
23.6	11.9	0	0	1	0	1
16.7	8.0	0	0	0	1	0
56.5	36.1	0	0	0	1	1
33.0	17.7	0	1	1	0	1
67.7	47.4	0	1	0	1	1
77.6	60.2	1	0	0	0	0
98.6	95.0	1	0	0	1	0
98.5	96.7	1	0	1	0	1
99.6	99.2	1	0	0	1	1

V. GROWTH OF ENTREPRENEURIAL FIRMS

This section analyses what specific entrepreneurial factors determine whether an entrepreneur is successful and succeeds in making his/her business grow into a larger size, when all other structural characteristics related to the industry are controlled for. In other words, it is of interest to know to what extent the growth performance of firms after startup is affected by the factors related to the entrepreneur, relative to other more structural growth determinants which are advanced by the literature on firm growth.

The theory of firm growth has long been inspired by Gibrat [1931] who considered firm growth as a random process, i.e. firm growth rates are distributed independently of firm size. A class of stochastic growth models developed subsequently combined Gibrat's Law with a range of weaker

assumptions [*Ijiri and Simon, 1977*]. Meanwhile empirical studies conducted over different time periods, different countries and covering several manufacturing industries demonstrated that Gibrat's Law fails as a significant negative relationship seems to exist between firm growth and firm size [*Kumar, 1985; Evans, 1987a; Audretsch and Mahmood, 1994; Dunne and Hughes, 1994*].¹⁴

One explanation for the observed negative size-growth relationship may be due to the existence of economies of scale in certain industries. Firms operating below the minimum efficient scale which are unable to overcome the diseconomies of scale are forced out of the industry. The more efficient firms grow faster than larger counterparts as they overcome their initial scale disadvantage investing gradually and more than larger firms. Audretsch [*1995*] finds supportive evidence for the hypothesis that a larger gap between the MES and firm size is related to higher growth rates of surviving firms. Evans and Jovanovic [*1989*] on the other hand show that liquidity constraints influence investment decisions. Since cash constraints are expected to be less binding after start-ups, cash constrained startups should expect higher than average growth rates. This effect induces a negative relationship between an entrepreneur's income or the firm's initial size and growth.

More recently, the growth of firms is viewed as a post-entry learning process [*Jovanovic, 1982; Pakes and Ericson, 1990*]. Once firms are operating in the industry the achieved profits reveal information about the true efficiency level of the firm and managers adjust the firm's scale of operations accordingly. Pakes and Ericson [*1990*] elaborated the model allowing individuals to improve, and not just uncover, their level of managerial ability through human capital formation in a process of active learning. The learning process implies a negative firm age – firm growth relationship, as for younger firms there are still more opportunities for learning. Firms ran by entrepreneurs possessing a larger human capital stock should be more efficient, thereby growing relatively faster.

A growing body of evidence supports this evolutionary view. The relationship between firm age and growth is found to be negative in a number of empirical studies [*Evans, 1987a, 1987b; Dunne and Hughes, 1994*]. Variability of firm growth tends to decrease as firms grow older [*Evans, 1987a; Dunne, Roberts and Samuelson, 1989*]. A positive relationship between the level of human capital of the proprietor, reflected in age and education, and the longevity of small businesses is found by Bates [*1990*] for US firms. McPherson [*1996*] finds for five African countries that firms of experienced, educated and trained proprietors grow more rapidly than those of proprietors possessing smaller stocks of human capital. In a similar way, Aftab and Rahim [*1989*] found evidence that a lack

of formal education and training of entrepreneurs and poorly developed managerial skills created serious barriers for the expansion of informal firms in Pakistan. Nafziger and Terrell [1996] on the other hand find that education of the founding entrepreneur reduces firm survival, indicating that opportunities of entrepreneurs outside the firm are important in analysing firm development.

In the context of developing countries, institutional economists view the growth process of firms and the resulting market structure as subject to a number of institutional factors. The relative development of markets and institutions and the transaction costs which result from ill-developed markets may favour some firms and hamper others in their growth.¹⁵ In a similar line of reasoning, organisational ecology models recognise that besides competition for scarce resources, legitimation in the industry is another important process by which resources are allocated and firms grow. Legitimation or institutionalisation refers to the social acceptance of an organisational form [Hannan and Carroll, 1992]. Consistent with this, Storey [1994] found an association between the legal status of the firm on the one hand and both firm growth and the likelihood of bank lending on the other hand.

VI. DETERMINANTS OF THE GROWTH OF ENTREPRENEURIAL FIRMS IN CÔTE D'IVOIRE

Following the arguments of the previous section, this section tests whether the growth relationship found for industrialised countries holds for firms in the manufacturing sector in Côte d'Ivoire and analyses the effect of entrepreneur characteristics on firm growth. The estimating equation follows the structure proposed by Evans [1987a] and consists of a second-order approximation of a general growth function in age and size, extended by a set of specific growth shifting factors.

$$\frac{\log(S_{t'}) - \log(S_t)}{d} = a + b_1 \log(S_t) + b_2 [\log(S_t)]^2 + b_3 \log(A_{t'}) + b_4 [\log(A_{t'})]^2 + \quad (3)$$

$$b_5 \log(S_t) * \log(A_{t'}) + \sum_{i=1}^n b_i X_i$$

where $S_{t'}$ and S_t are the size of a firm in period t' and in period t respectively, $A_{t'}$ is the age of the firm in period t' , and $d = t' - t$, the period over which growth is measured. The variables X_i take into account the effect of institutional factors and human capital embodied in the entrepreneur, in line with the arguments developed in the previous section.

The dependent variable is the average annual growth rate of sales¹⁶ calculated over a five year period from 1989 until 1994.¹⁷ Among the

explanatory variables, size is measured at the beginning of the period under consideration. Age is measured in 1994. Both size and age are in logarithmic terms.

Another set of binary variables defines the firms' sector of activity (FOOD, WOOD, METAL). Textiles is taken as reference sector. To measure to what extent legitimation in the industry is important, a binary variable FORMAL is used which takes the value one if the firm has a formal status and zero if the firm is operating in the informal or semi-formal sector.

Human capital is captured by formal education (PRIMARY, SECONDARY, HIGHEDEC as defined earlier) and the age of the entrepreneur, measured in years (ENTRAGE). As a large number of entrepreneurs have been apprenticed and have acquired working experience, the binary variables UNEXPER and NOAPPR are included taking the value one, for, respectively, unexperienced entrepreneurs and entrepreneurs who have not been an apprentice previously. In a similar way CWEALTH equals one if the entrepreneur possesses no real estate, no transport vehicle nor any other asset. This reflects both the entrepreneurs lack of personal wealth and savings for financing investments and daily operations as well as his lack of access to external financing due to missing collateral.

Estimation and Results

The model is estimated using a two-stage procedure where the fitted values of a probit equation, explaining the probability that a firm is formally registered, are entered into the growth equation [Barnow *et al.*, 1981]. This procedure is adopted to account for the possible bias originating from endogeneity of the variable FORMAL. It should also be noted that only surviving firms are included in the data set. A recent study by McPherson [1996] on the growth of firms in five southern African countries analyses the possible selection bias resulting from the exclusion of exiting firms on the growth relationship and finds this bias to be insignificant.

The cross-firm distribution of growth rates is typically wide, especially for entrepreneurial firms.¹⁸ The mean growth rate for this sample is 0.035 but hides a large dispersion. The standard deviation equals 0.29 with growth rates ranging from -0.39 to +0.51.

Whereas an apprenticeship or former experience are found to be factors with a strong positive effect on individuals' propensity towards entrepreneurship, they do not seem to have any influence on the firm's post-entry growth performance. The same is true for the age of the entrepreneur. The other factors work in the expected direction. The further interpretation of the model follows the results from the restricted model where the collinear and statistically non-significant variables experience, apprenticeship and the age of the entrepreneur have been removed.

TABLE 6
 DETERMINANTS OF GROWTH OF ENTREPRENEURIAL FIRMS OVER THE
 PERIOD 1989-94

Average annual growth rate 1989-94		
Constant	0.375 * (0.185)	0.231 (0.169)
SIZE	-0.263 *** (0.047)	-0.267 *** (0.043)
SIZE ²	0.014 *** (0.004)	0.014 *** (0.004)
AGE	-0.166 (0.104)	-0.163 (0.100)
AGE ²	0.018 (0.019)	0.008 (0.019)
AGE*SIZE	0.028 * (0.014)	0.031 ** (0.014)
FOOD	-0.033 (0.079)	-0.041 (0.070)
WOOD	0.111 (0.085)	0.085 (0.081)
METAL	0.124 * (0.062)	0.160 ** (0.065)
FORMAL	0.326 *** (0.091)	0.278 ** (0.105)
PRIMARY	0.138 (0.114)	0.154 (0.120)
SECONDARY	0.345 *** (0.115)	0.375 *** (0.126)
HIGHEDUC	0.435 *** (0.108)	0.470 *** (0.112)
ENTRAGE	-0.005 (0.003)	-
UNEXPER	-0.039 (0.064)	-
NOAPPR	0.071 (0.076)	-
FEMALE	-0.363 *** (0.119)	-0.292 *** (0.084)
CWEALTH	-0.356 *** (0.102)	-0.363 *** (0.095)
R-Adj.	0.509	0.521

Note: Standard errors (in parentheses) are estimated using White's consistent estimator [White, 1980]; Significance levels: *** 99 per cent; ** 95 per cent; * 90 per cent.

The relationship between firm size and growth is negative, implying that smaller firms grow faster than larger ones. The quadratic term of size is positive and significant at the 99 per cent level indicating that the negative effect of size on growth diminishes for larger size classes. The partial derivative of growth to size evaluated at the sample mean value of age and size is negative (-0.09). The elasticity of end-of-period size with respect to beginning-of-period size equals 0.57. The relationship between firm age and growth seems to follow the inverse pattern suggested by the models of learning. At the sample mean the elasticity of size with respect to age equals -0.06.

The coefficient of the variable FORMAL indicates an effect of formal legitimation on the growth performance of firms. This result indicates that the process of legitimation through formal registration is important in Côte d'Ivoire. Resources appear to be allocated to firms benefiting from a reputation of trustworthiness, creditworthiness and quality towards banks, suppliers, consumers and government officials. Belonging to the formal sector increases firms' transparency of activities and lowers transaction costs. Firms in metal working tend to grow significantly faster than firms in the textiles sector thereby exploiting the important economies of scale that exist in the metal-making sector.

Formal education of the entrepreneur seems to influence gradually and positively the firm's growth performance. For secondary and higher education the effect is significant at the 99 per cent level with the largest effect on growth for entrepreneurs holding a university degree. These findings show that, while entrepreneurs are found among the former apprentices and the highly educated individuals, the most successful entrepreneurs are found in the latter group. Apprenticeships enhance the choice for entrepreneurship, but rather for small-scale activities which require high technical skills and little managerial ability and business organisation. An enlargement of the scale of activities would imply that the entrepreneur becomes more involved in administrative and managerial rather than production activities while he may lack training in this field. The findings are in line with the results obtained by Vijverberg [1991] that occupational experience, not apprenticeships, contribute to superior firm performance.

Female-run firms appear to grow more slowly. This result is in line with studies indicating that female entrepreneurs are more restricted in their access to inputs and operate in a more restrictive environment. The size of entrepreneurial firms is typically small as can be seen from Table 1. Informal firms and firms run by females remain substantially smaller even over time. The average size of the informal and semi-formal firms equals 5, with no firm exceeding 50 employees. For firms run by females the average size is 19, against 46 for firms run by men.

VII. CONCLUSION

In analysing the determinants of entrepreneurship and entrepreneurial success, this study has uncovered some important elements for promoting entrepreneurship and enterprise development in developing countries. Within an environment characterised by failures in factor markets, the personal characteristics of the entrepreneur, especially his human capital and financial status, play a decisive role in the development of successful enterprises.

Human capital is built up through formal education, experience and apprenticeships. The various human capital factors nevertheless affect the process of entry and the process of firm growth in distinctive ways. Individuals tend to enter self-employment after an apprenticeship during which all technical skills are acquired to replicate independently the activities in which they were trained. Once established few individuals succeed in making the new business grow, implying that operations on a larger scale require more managerial than technical capacities to oversee and coordinate the business. Formal education, on the contrary, increases gradually the learning capabilities of individuals, thereby raising entrepreneurial efficiency and resulting in more successful firm growth. Taking into account the effects of human capital of entrepreneurs, evidence suggests that entrepreneurship continues to be hampered by financial constraints. Rather than acting as substitutes, human and financial capital are both found to be important complementary factors for entrepreneurship and successful growth.

Moreover, high transaction costs and asymmetries in information in financial markets moreover cause resources to be allocated on the basis of other criteria. Firms with a strong legitimate status in the industry, keeping records, fulfilling tax obligations, respecting labour and other regulations have easier access to inputs, leading to better growth opportunities.

From a policy perspective, the findings call for an integrative approach to support entrepreneurship. Within such an approach, the provision of capital funds should be linked with simultaneous efforts to upgrade managerial capabilities, provide better access to markets and facilitate the formal legitimization of firms.

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NOTES

1. The label of 'entrepreneurial firm' is given to firms owned by one or a few individuals who at the same time manage the firm. They are therefore explicitly distinguished from SOEs, subsidiaries, or firms of which the ownership is dispersed over a large number of people.
2. Jovanovic [1994] and Blau [1985] for developing country labour markets.

3. In developing economies where unemployment levels are high, the chances of finding a job are small and wage income is uncertain.
4. This equation is expressed in terms of certainty equivalent of the equation:
 $E[U(p, e)] \geq E[U(w, u)]$ where the individual compares the expected utilities U related to entrepreneurial profit p , respectively wage w , and the corresponding non-pecuniary benefits derived from the way the income is earned, e and u .
5. $r(\bar{p}) = -(U''(\bar{p}) / U'(\bar{p}))$ and $r(\bar{w}) = -(U''(\bar{w}) / U'(\bar{w}))$
6. Persons with an 'internal locus-of-control' are more likely to become successful entrepreneurs as they perceive the outcome of an event as within their personal control.
7. The data collection was done by researchers of the Catholic University of Leuven, the Université de l'Auvergne in collaboration with local researchers of CIREs (Centre International de Recherches Economiques et Sociales) and the University of Abidjan.
8. This is a census of firms established by the end of 1993 and it is compiled from data of the 'Banque de Données Financières' (BDF) and the corporate tax authorities, the 'Direction Générale des Impôts' (DGI). The Banque de Données Financières (BDF) contains annual financial statements of approximately 2,500 firms. The data base includes most of the larger private firms as well as some 60 SOEs.
9. The semi-formal firms are in size and technology comparable to the group of informal firms, but they created a specific union, the CONOCL, in order to obtain specific rights and to get access to public services that were previously exclusively available for formal firms. The semi-formal firms do not keep records but do pay taxes on an estimate of their turnover, as well as the local and national business licence tax.
10. Following the classification codes of the Côte d'Ivoire National Institute of Statistics (INS), the firms were sampled from the sectors 06, 07, 08, 09, 10, 11, 13, 18 and 20.
11. With the use of longitudinal data, it would become possible to identify, from a dynamic perspective, the factors which determine individual's switches into or out of self-employment. The reference group in such case should be the whole population. However, the cross-sectional data of the RPED survey only provide information about individual's occupation at one single moment, as it results from sustained decisions in the past.
12. See among others Morrisson *et. al.* [1994]. Using data of Niger, Swasiland, and non-African countries they show that the proportion of female entrepreneurs strongly differs between countries and between sectors of activity within one country.
13. Data on the composition of the labour force of the 2,408 formal firms reporting to the BDF (Centrale des Bilans, 1986) show that the proportion of female workers among white collars, respectively blue collars and apprentices is 16.1 per cent, respectively 3.7 per cent and 0.3 per cent. Female representation in the Ivorian formal sector labour force equals seven per cent.
14. Gibrat's law is also questioned by studies finding the variability of growth rates to decrease with firm size [Hall, 1987; Dunne and Hughes, 1994, among others].
15. See for instance Nabli and Nugent [1989] for the effect of transaction cost on the size distribution of firms and Nugent and Nabli [1989, 1992] for the effect of the relative development of financial markets on firm size distributions.
16. Sales data are taken instead of employment data because a small firm or microenterprise can expand its sales considerably before hiring a new employee. The employment growth analysis would therefore hide a more continuous growth process, especially for smaller firms.
17. For firms which were created after 1989 growth is measured over the period of existence.
18. The coefficient of variation of sales growth of the entrepreneurial firms in the sample is more than double the coefficient of variation of the total sample of firms, including managerially run firms.

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APPENDIX
ESTIMATION OF THE EXPECTED WAGE

A.1. Explanation of variables used to estimate the expected wage:

LEARN	logarithm of total earnings per worker (base wage+allowances+benefits)
SPRIM	=1 for workers who started primary education but didn't finish it;
PRIM	=1 for workers who finished primary education;
SSEC	=1 for workers who started secondary education but didn't finish it;
SEC	=1 for workers who finished secondary education
STSEC	=1 for workers who started technical secondary education but didn't finish it;
TSEC	=1 for workers who finished technical secondary education
SHIGH	=1 for workers who started higher education both technical or academic but didn't finish it;
HIGH	=1 for workers who finished higher technical or academic education
AGE	age of the worker, in years
AGESQ	(AGE) ²
SENIORIT	total number of years worked
APPR	=1 for workers who have been apprentice;
FEMALE	=1 for female workers;
NONAFR	=1 for workers of non-African ethnic origin;
TEXTILES	=1 for workers in textiles and clothing;
WOOD	=1 for workers in wood working;
METAL	=1 for workers in metal working;

A.2. Estimation results:

LEARN =	9.040	+0.220 SPRIM	+0.301 PRIM	+0.087 SSEC
	(0.274)	(0.072)	(0.070)	(0.070)
	+0.183 SEC	+0.207 STSEC	+0.495 TSEC	+0.376 SHIGH
	(0.086)	(0.199)	(0.081)	(0.196)
	+0.887 HIGH	+0.083 AGE	-0.001 AGESQ	
	(0.089)	(0.016)	(0.000)	
	+0.007 GENEXP	-0.072 APPR	-0.154 FEMALE	
	(0.004)	(0.042)	(0.068)	
	+1.427 NONAFR	-0.095 TEXTILES	+0.150 WOOD	
	(0.150)	(0.066)	(0.052)	
	+0.136 METAL			
	(0.053)			

Adj. R²= 0.510;

Number of observations= 792

