**Entrepreneurial Performance in the Informal Sector: The Role of Human Capital**

Proposed by:

**ATTOLOU Sedami Nadege Marsove**

Laboratoire d’Economie Publique (LEP, Benin)

*Email :* *amarsove@gmail.com*

**Abstract :**

This study investigates the role of human capital in shaping the performance of informal entrepreneurs in Benin, using survey data from the *Enquête Régionale Intégrée sur l’Emploi et le Secteur Informel* (ERI-ESI) covering 3177 individuals operating outside the formal economy. We estimate a two-step Heckman selection model to correct for potential selection bias and explore how individual characteristics, motivations, and firm-level factors relate to profitability. The findings show that formal education levels are generally low among informal entrepreneurs, and higher levels of education are associated with better outcomes, although few reach tertiary education. General work experience significantly boosts profits, while sector-specific experience has a limited impact. Surprisingly, specific training is marginally and negatively associated with profitability, pointing to a possible mismatch between training content and entrepreneurial needs. Additionally, necessity-driven entrepreneurs earn considerably less than those motivated by opportunity, underscoring the role of agency in entrepreneurial success. Women, overrepresented in the informal sector benefit more from increased working hours but remain concentrated in lower-performing sectors. These findings underscore the urgent need to strengthen human capital through accessible, high-quality, and context-sensitive education and training programs tailored to the realities of informal entrepreneurship in Benin.

**Keywords**

Informal economy; Human capital; Firm performance

JEL Classification: E26; J24; L25

**Introduction**

Entrepreneurship has emerged as a key driver of economic growth in both developed and developing countries (Audretsch & al., 2006; Koellinger & Thurik, 2012; Van Praag & Versloot, 2007). Entrepreneurs play a crucial role in job creation, innovation, competition, and overall economic efficiency (Acs, 2006; Audretsch & Thurik, 2004). Research indicates that entrepreneurs accumulate significantly more wealth than salaried workers, with higher household assets and net worth (Cagetti & De Nardi, 2006; Nanda, 2008; Quadrini, 2000), enjoying superior living standards (Carter, 2011). These advantages have led governments to implement policies promoting entrepreneurship, including regulatory reforms, training programs, and financial support.

However, only a small fraction of businesses, mostly relatively young, high-growth, or high-impact firms, in terms of sales or employment contribute to the majority of wealth creation (Shane, 2009) and represent the segment that earns higher incomes (Hamilton, 2000; Parker, 2009). Hartog & al. (2010) even suggest that some entrepreneurs might generate greater wealth as employees rather than business owners.

In this context, the entrepreneurship literature has identified several factors that determine business performance. Business performance is defined as the ability to ensure the growth or survival of a company (Chon, 2008). It is also understood as the ability to achieve goals and generate income (Gerba & Viswanadham, 2016). Among the factors affecting business performance, human capital has been identified as the most important (Crook et al., 2011): human capital makes the founder more effective in managing and operating the business. Indeed, Coleman (1988) describes human capital as a resource that endows individuals with skills and capabilities essential for effective business management, directly influencing success. Consequently, both developed and developing nations emphasize human capital development as a catalyst for economic growth and sustainable development.

In Benin, the youth labor market has undergone significant changes in recent years: a decrease in activity rates and a substantial increase in the average level of education on the supply side, alongside lower recruitment of entry-level workers and rising demands for qualifications and skills on the demand side. While employment was not a major issue for education system graduates during the early years of independence, saturation in the economic sector and the public administration, combined with rapid population growth, have led to growing problems of unemployment and underemployment among graduates (Baba-Moussa, 2017). As a result, many young people turn to entrepreneurship as a better alternative to meet their needs and avoid unemployment.

Given the numerous benefits of entrepreneurship for individuals and society, promoting entrepreneurship has become a fundamental part of economic development policies in recent years, and various programs have been implemented in Benin to support young entrepreneurs. These programs include the Growth Strategy for Poverty Reduction, which places special emphasis on entrepreneurship, the creation of the Business Promotion Center (BPC), and the establishment of the Women Business Promotion Center (WBPC) project.

Furthermore, entrepreneurship in Benin is predominantly informal, with 97.2% of enterprises operating outside formal structures, exhibiting spatial disparities between urban (96%) and rural (99%) areas (INStaD, 2018). It is well recognized that in developing countries, the informal economy holds strong potential for growth and development. As cited by the International Labour Organization (ILO), contrary to previous assumptions, the informal sector is not a transient or marginal phenomenon destined to disappear in the medium term. Its growing scale and complexity in the economic, social, and political life of developing countries, especially in Africa, is an undisputed and increasingly acknowledged reality.

Nevertheless, the situation of informal sector workers in Benin remains precarious, and informal activities are those with the most variable income levels. Recognizing the pivotal role of entrepreneurship and the informal economy in the growth and development of developing countries, it becomes crucial to understand what drives the performance of informal enterprises. This study aligns with this perspective and aims to examine the relationship between human capital and the performance of informal enterprises in Benin.

This study is of dual interest. First, it supports the development of policies aimed at improving income generated through informal sector activities. Second, it contributes to the literature on the performance of informal enterprises by providing new empirical evidence on how different forms of human capital influence firm performance in Benin's informal sector. In doing so, it seeks to better understand the mechanisms through which entrepreneurship can serve as a sustainable solution to youth unemployment and economic vulnerability in developing contexts.

The study is structured as follows: the first section reviews the relevant literature, the second outlines the research methodology, and the third presents and discusses the findings.

**Literature Review**

* **Theorical review**

The effect of human capital on the performance of informal enterprises is analyzed using occupational choice models. These models aim to provide a theoretical framework for entrepreneurship. According to Parker (2007), entrepreneurship is studied as an occupational choice in the labor market, where individuals decide between salaried employment and non-salaried activities such as self-employment or business creation. Several factors influence this choice, including economic, sociocultural, psychological, and institutional elements, as well as personal characteristics such as age, gender, and human capital. Among these, human capital is frequently cited as a key determinant of occupational choice and entrepreneurial success.

Human capital theory (Becker, 1964) posits that education enhances skills that increase worker productivity, with wage differentials reflecting variations in productivity. Consequently, more educated workers earn higher wages, all else being equal, simply because they are more productive than their less-educated counterparts. This study follows this logic by adopting the occupational choice framework.

In the occupational choice model developed by Lucas (1978), the workforce is divided into two categories: employees and managers (or entrepreneurs). Employees are assumed to have homogeneous productivity, whereas entrepreneurs exhibit varying levels of managerial ability. In other words, individuals share the same productivity when employed but differ in their managerial talent. It is this innate managerial ability that determines whether an individual becomes an entrepreneur or remains an employee. The fundamental idea is that entrepreneurs choose to start a business rather than pursue salaried work because they possess a unique talent or aptitude that enables them to lead rather than follow. Since earnings are an increasing function of aptitude, the model can be summarized as follows:

When wages (w) are not a function of aptitude (x), a higher level of x increases entrepreneurial profit (π): $π=g\left(x\right)with g^{'}(x)>0$. The higher an individual's aptitude, the more productive they become, utilizing greater amounts of labor and capital, thereby increasing their income.

* When wages vary with aptitude, a higher x also leads to higher wages (w) $π=g\left(x\right)et w=p(x)$

where both functions are increasing: ($g^{'}\left(x\right)>0et p^{'}(x)>0$)

Unlike Lucas, Kihlstrom and Laffont (1979) propose an alternative model in which occupational choice is driven not by differences in aptitude (assumed to be identical among all individuals) but rather by varying degrees of risk aversion.

* **Empirical Review and Hypotheses**

The literature on entrepreneurship has identified several key factors that influence business performance, including the entrepreneur’s human capital, firm-specific characteristics, and sectoral attributes. Among these, human capital is considered the most crucial.

Human capital is defined as the combination of knowledge, skills, abilities, and personal attributes that enhance individual, social, and economic outcomes (Brian, 2007). As highlighted by the theory of endogenous growth (Romer, 1990), an economy with a higher stock of human capital tends to experience faster growth. Similarly, the growth of a business is positively linked to the level of human capital it possesses.

Becker (1964) distinguishes two types of human capital: general and specific. General human capital refers to skills acquired through formal education, training, and work experience skills that are transferable across sectors. In contrast, specific human capital relates to job-specific skills that are only applicable within a particular field and cannot be easily transferred to other professions.

**General Human Capital and Entrepreneurial Performance**

In examining the relationship between an entrepreneur’s general human capital and business performance, two key variables are typically considered: educational attainment and work experience. Among these, education has received particular attention. Education is believed to increase opportunity costs, and as such, is expected to be positively associated with business growth (Cassar, 2006). Several studies have demonstrated that the entrepreneur's level of education not only influences the decision to engage in entrepreneurship but also impacts the success of the business.

Calvo and Wellisz (1980) as well as Van Praag and Cramer (2001) argue that education enhances an individual's capacity to undertake entrepreneurial activities effectively and contributes to increased profitability. Similarly, Cooper & al. (1994) found that holding a university degree positively influences both the survival and growth of small enterprises, as higher education enables entrepreneurs to better navigate challenges and seize growth opportunities. Bosma, van Praag, Thurik, and De Wit (2004) also observed that entrepreneurs with higher education tend to achieve greater profitability. Higher levels of education may not only enhance communication and social skills but also improve learning abilities, which in turn facilitate the acquisition of information and competencies necessary for identifying and exploiting entrepreneurial opportunities (Marvel & Lumpkin, 2007). In this sense, education fosters creativity and innovation.

In Malawi, Kolstad and Wiig (2015) found that more educated entrepreneurs generate higher profits than those with little or no education consistent with their earlier findings in Angola, where each additional year of education increased entrepreneurial earnings by 7.1% to 9.4%, depending on the instrument used (Kolstad & Wiig, 2013).

However, some studies challenge the presumed positive relationship between education and business performance. Ucbasaran & al. (2008) argue that entrepreneurs with very high levels of general education and experience may not necessarily convert this into better performance. They may overestimate the sufficiency of their education, neglecting other sources of relevant information that could improve managerial decisions and adaptability. Lindsey (2004) highlights that while educated entrepreneurs generally perform better than their less-educated counterparts, those with doctoral degrees may not perform as well. In the same vein, Stuart and Abetti (1990) reported an insignificant and even negative relationship between education and firm performance, primarily due to underperformance among PhD holders.

As for work experience, several authors argue that general labor market experience can positively influence business performance. Practical knowledge of profitable niches and productivity-enhancing strategies can support business success (Rauch & Rijsdijk, 2013). Koellinger (2008) notes that highly inventive individuals often operate as generalists with interdisciplinary knowledge, enabling them to approach challenges from diverse perspectives. Thus, varied work experience may increase both the likelihood of becoming an entrepreneur and the successful commercialization of products or services.

On the other hand, some studies suggest that extensive general experience could negatively affect business performance, as it tends to correlate with age. Older entrepreneurs may be more psychologically committed to the organizational status quo, potentially limiting innovation (Hambrick & Mason, 1984; Roper, 1998) and reducing entrepreneurial success (Harada, 2003). Additionally, older individuals may face familial responsibilities that deter them from taking the risks necessary for business growth (Colombo & Delmastro, 2001). Therefore, an inverted U-shaped relationship may exist between general human capital and business performance. The literature indicates that a certain level of domain-specific knowledge—acquired through education or experience is crucial for effectively interpreting and leveraging information in business (Park, 2005).

* **H1:** The entrepreneur’s level of education positively influences the performance of informal enterprises.
* **H2:** General work experience does not significantly affect business performance.

**Specific Human Capital and Entrepreneurial Performance**

Several studies have shown that the relationship between human capital and entrepreneurial performance is stronger when considering entrepreneurship-specific education or experience, rather than general education or experience.

Specific education, such as managerial and marketing skills acquired through formal education, is vital for the commercial success of a business, as it can contribute to the development of strategies needed for successfully leveraging technological innovations in the market (Berry, 1996; Tether, 1997). Along the same lines, Olofsson and Stymne (1995), Parger (1995), and Delapierre & al. (1998) show that the absence of entrepreneurial and/or business/management skills limits business growth. In high-tech companies, specific education (technological competencies and management skills marketing, finance, etc.) is considered a key determinant of success (Galbraith, 1982; Berry, 1996). Colombo and Grilli (2005) even found that the number of years founders spent in economics and management education, and to a lesser extent in science and technology fields, positively affects business growth, whereas training in other fields does not.

Moreover, specific training tailored to entrepreneurship such as accounting, marketing, or supply chain management can improve performance by helping entrepreneurs make more informed decisions and avoid common pitfalls (Martin & al., 2013). These targeted skills increase an entrepreneur’s capacity to manage risk, respond to changes in the market, and improve operational efficiency.

However, not all studies agree on the extent of this impact. Some research suggests that while specific training may help, it is not a guaranteed predictor of success if not complemented by other factors such as access to finance or a conducive business environment (Naudé, 2008). Additionally, in informal settings where resources are limited, the return on specific training may be lower due to structural constraints.

Specific experience also positively influences business performance. It can be gained through previous roles as a business owner or manager, or from holding technical, commercial, or managerial positions (see, for example, Van de Ven and al. 1984; Cooper 1985; McGee and Dowling 1994; Eisenhardt and Schoonhoven 1990; Brüderl and Preisendörfer 2000; Colombo and Grilli 2005). In this case, studies have shown that entrepreneurs with prior business experience tend to perform better because they have already navigated similar challenges. For instance, they are more familiar with the market, have better management practices, and are more skilled at identifying viable business opportunities (Unger and al., 2011). Specific human capital thus contributes to enhancing the efficiency of business operations and the likelihood of business success. Also, Stuart and Abetti (1990) suggest that time spent in startups is considerably more valuable than time spent in school when it comes to business success. Sector-specific experience in particular has a negative effect on business failure and a positive effect on performance. Feeser and Willard (1990) found that entrepreneurs’ previous ventures with related products and markets experienced higher growth rates. Brüderl and al. (1992) and Brüderl and Preisendörfer (2000) reached similar conclusions. Bosma and al. (2004) also observed that experience in the same sector significantly impacts survival, profitability, and business size. Experience in similar markets may also benefit firms through existing relationships with suppliers/clients and knowledge of sales techniques and capital requirements (which can vary across sectors) (Marvel and Lumpkin 2007). Thus, prior experience can be even more beneficial when gained in the same industry (Nichter and Goldmark, 2009).

However, a combination of both specific education and specific experience leads to better performance compared to general human capital. Gimeno and al. (1997) observed that specific human capital, as opposed to general human capital, is more likely to contribute to firm success and superior performance. Unger and al. (2011) found a significant but weak relationship between human capital (general education and experience) and business success; however, this relationship becomes stronger when human capital is linked to task-specific knowledge and skills in entrepreneurship.

**H3**: Sector-specific experience improves performance

In summary, the above-mentioned studies suggest that the impact of education level on performance remains inconclusive. While some authors report a positive effect, others highlight a negative impact of higher education levels on business performance. Still, others argue that general education alone is insufficient for entrepreneurial success; entrepreneurs need prior knowledge and skills related to their business sector. Lazear (2004) even argues that entrepreneurs must possess a diverse set of skills to succeed in business. Laguir and Den Besten (2016) point out that a high level of formal education has no significant impact on business performance, but when combined with professional experience, it tends to improve the upgrading level of small and medium enterprises. Similarly, Colombo and Grilli (2005) find that entrepreneurs with higher levels of both general and specific human capital exhibit better performance than those with lower levels.

It is also important to note that the approaches to defining and measuring entrepreneurial success vary across studies and include measures such as profits, business survival, R&D/innovation, productivity, and revenue. Dickson and al. (2008) note that these various measures not only lead to confusion but may also explain the mixed results often found in this field.

**Methodology**

This study employs a two-stage econometric approach to investigate the determinants of entrepreneurial performance among informal sector participants in Benin, with a focus on the role of human capital. To account for potential selection bias due to individuals self-selecting into entrepreneurship, we estimate a two-step Heckman selection model.

**1. Selection Equation (Occupational Choice)**

In the first stage, we model the individual’s decision to engage in entrepreneurship (as opposed to salaried employment) using a binary choice framework. Let Yi∗Y\_i^\*Yi∗​ represent a latent variable indicating the propensity of individual iii to become an entrepreneur. The model is specified as:

$$Y\_{i}^{\*}=γ\_{0}+γ\_{1}Age+γ\_{2}Sex+γ\_{3}Area+γ\_{4}Primary+γ\_{5}Secondary+γ\_{6}Tertiary+γ\_{7}Mother\\_ent+γ\_{8}Father\\_ent+γ\_{9}time\\_unemployed+μ\_{i}$$

Where:

* $Y\_{i}^{\*}$​ is the latent variable representing the propensity to become an entrepreneur.
* $Age$ ​,$Sex$ ​, and $Area$ ​ are demographic variables,
* $Primary$ ​, $Secondary$ ​, and$Tertiary$ ​ represent educational attainment levels (with "No education" as the base category),
* $Mother\\_ent$ ​ and $Father\\_ent$ are indicators of parental entrepreneurship,
* $μ\_{i}$​ is the error term.

The observed decision is :

$$Y\_{i}=\left\{\begin{array}{c}1, if Y\_{i}^{\*}>0 (Entrepreneur)\\0, if Y\_{i}^{\*}\leq 0 (Salaried Worker\end{array}\right.$$

This is estimated using a Probit or Logit model.

**2. Outcome Equation: Determinants of Entrepreneurial Performance**

In the second stage, conditional on choosing entrepreneurship, we analyze the determinants of business performance. Business performance is proxied by profits, defined as the difference between total sales and operational expenses. To account for the skewed distribution of profits, we use the natural logarithm of profits as the dependent variable. The outcome equation is specified as:

$$lnProfit\_{i}^{ENT}=β\_{0}+β\_{1}Age+β\_{2}Sex+β\_{3}Primairy+β\_{4}Secondary+β\_{5}Tertiary+β\_{6}GenExp+β\_{7}SpecTraing+β\_{8}Sector\\_exp+β\_{9}Workhour+β\_{10}Business\_{Area}+β\_{11}Firm\_{age}+β\_{12}Firm\_{size}+ε\_{i} i=1,…, n\_{j}$$

Where

* $GenExp$: general professional experience
* $SpecTraing$: Training correspondent to the entrepreneurial activity
* $Workhour $: time dedicated to work per month
* $Sector\\_exp $: prior experience in the same sector,
* $Business\_{Area} $: rural vs. urban business location,
* $Firm\_{age} $: age of the business
* $Firm\_{size} $: categorical variable indicating number of employee,
* $ε\_{i}$​ is the error term capturing unobserved heterogeneity.

The Inverse Mills Ratio, derived from the first-stage Probit model, is included in the second-stage regression to control for selection bias.

This two-step Heckman approach allows us to disentangle the factors influencing both the decision to enter entrepreneurship and the subsequent success of entrepreneurial ventures in the informal sector, with a particular emphasis on the contribution of human capital.

Variables

Table n°1: Definition of variables

|  |  |  |
| --- | --- | --- |
| Variables | Definition | Expected sign |
| Level of education | 0-No education; 1- Primary; 2- Secondary1; 3- Secondary; 4-Tertiary | + |
| General Experience | In years | + |
| Sector experience | years of sector-specific experience |  |
| Specific training | 1 if Entrepreneur attended a specific training, 0 if note  | + |
| Age  | In years | + |
| Sex | 1 if entrepreneur is a woman, 0 if not | - |
| Number of work hours | Number of work hours per month | + |
| Motif of entrepreneurship | 1-Necessity entrepreneurship ; 2-Opportunity entrepreneurship | - |
| Area of implantation | 1-Urban ; 2-Rural | - |
| Firm size | Number of employees | + |
| Firm age | Years in business | + |

Source : Author

**2.3. Data Source**

The data used in this study come from the *Enquête Régionale Intégrée sur l’Emploi et le Secteur Informel* (ERI-ESI), conducted by the *Institut National de la Statistique et de l’Analyse Économique* (INSAE) in collaboration with the *Agence Nationale de la Promotion de l’Emploi* (ANPE) and the *Observatoire National pour l’Emploi du Bénin* (ONEB). This survey is part of the 2015–2020 Regional Statistical Program (PSR), which includes components on National Accounts, Business Statistics, and the Integrated Regional Survey on Employment and the Informal Sector. It is financed by the Commission of the West African Economic and Monetary Union (WAEMU) and covers all WAEMU member states.

The survey was carried out from March to May 2018, following the model of modular mixed (household/enterprise) 1-2-3 type surveys. Its objectives include establishing a baseline for employment monitoring, providing data on the informal sector, and delivering harmonized statistics on governance, peace, and security within WAEMU member states. The ERI-ESI\_Benin covered 10,200 households and has national coverage. The results are representative at the national and departmental levels, as well as by area of residence (urban/rural).

The ERI-ESI survey comprises two components: the first collects data on the socio-demographic characteristics and employment of the population; the second gathers information from non-agricultural informal production units (IPUs) identified in the first component. This study focuses on the second component, which describes the operating conditions in the informal sector in Benin. It also provides information on the characteristics of the heads of informal production units, the workforce employed, remuneration, capital investment, and the challenges encountered across different sectors of activity.

For purposes of international comparison, the survey defines informality based on three criteria: lack of registration of the production unit, absence of formal and written accounting, and the production of marketable goods and services.

**Descriptive Statistics**

The following table presents the descriptive statistics of the variables used in this study.

Table n°2: Descriptive statistics

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Variable | Observations | Mean | Std. Dev. | Minimum | Maximum |
| Age | 5,737 | 35.64302 | 11.23844 | 15 | 64 |
| Levels of education |  |  |  |  |  |
| * No education
 | 5,737 | .563012 | .4960568 | 0 | 1 |
| * Primary
 | 5,737 | .1669862 | .3729961 | 0 | 1 |
| * Secondary 1
 | 5,737 | .1146941 | .3186802 | 0 | 1 |
| * Secondary2
 | 5,737 | .0861077 | .2805475 | 0 | 1 |
| * Tertiary
 | 5,737 | .0691999 | .2538159 | 0 | 1 |
| Sex |  |  |  |  |  |
| * Male
 | 5,737 | .4366394 | .4960124 | 0 | 1 |
| * Female
 | 5,737 | .5633606 | .4960124 | 0 | 1 |
| Area of residence |  |  |  |  |  |
| * Urban
 | 5,737 | .5269305 | .4993177 | 0 | 1 |
| * Rural
 | 5,737 | .4730695 | .4993177 | 0 | 1 |
| Entrepreneur’s father job |  |  |  |  |  |
| * Others
 | 5,737 | .4029981 | .4905431 | 0 | 1 |
| * Dad entrepreneur
 | 5,737 | .5970019 | .4905431 | 0 | 1 |
| Entrepreneur’s mother job |  |  |  |  |  |
| * Others
 | 5,737 | .5028761 | .5000353 | 0 | 1 |
| * Mum\_entrepreneur
 | 5,737 | .4971239 | .5000353 | 0 | 1 |
| Time unemployed (in months) | 5,737 | 15.88008 | 33.79291 | 0 | 480 |
|  |  |  |  |  |  |
| Profit | 3,177 | 126132.5 | 428270.8 | 250 | 1.42e+07 |
| Firm area of implementation |  |  |  |  |  |
| * Urban
 | 3,177 | .3997482 | .4899236 | 0 | 1 |
| * Rural
 | 3,177 | .6002518 | .4899236 | 0 | 1 |
| Number of working hours  | 3,177 | 177.2805 | 92.95507 | 0 | 392 |
| Entrepreneur’s age | 3,177 | 37.30563 | 10.82547 | 15 | 64 |
| Entrepreneur’s sex |  |  |  |  |  |
| * Male
 | 3,177 | .3292414 | .4700117 | 0 | 1 |
| * Female
 | 3,177 | .6707586 | .4700117 | 0 | 1 |
| Levels of education |  |  |  |  |  |
| * No education
 | 3,177 | .6531319 | .4760483 | 0 | 1 |
| * Primary
 | 3,177 | .1885427 | .3912065 | 0 | 1 |
| * Secondary1
 | 3,177 | .1032421 | .3043227 | 0 | 1 |
| * Secondary2
 | 3,177 | .0415486 | .1995868 | 0 | 1 |
| * Tertiary
 | 3,177 | .0135348 | .1155673 | 0 | 1 |
| Motif of entrepreneurship |  |  |  |  |  |
| * Necessity
 | 3,177 | .9439723 | .2300114 | 0 | 1 |
| * Opportunity
 | 3,177 | .0560277 | .2300114 | 0 | 1 |
| Source of start-up capital |  |  |  |  |  |
| * Inheritance
 | 3,177 | .6310985 | .4825831 | 0 | 1 |
| * Savings
 | 3,177 | .1164621 | .3208287 | 0 | 1 |
| * Loans/Microfinance credit
 | 3,177 | .005351 | .0729658 | 0 | 1 |
| * Associate contribution
 | 3,177 | .2470884 | .4313865 | 0 | 1 |
| Sector\_experience (in years) | 3,177 | .3169657 | 2.221221 | 0 | 40 |
| General experience (in years) | 3,177 | 1.267863 | 4.699036 | 0 | 45 |
| Specific training |  |  |  |  |  |
| * None
 | 3,177 | .9732452 | .1613914 | 0 | 1 |
| * Specific training
 | 3,177 | .0267548 | .1613914 | 0 | 1 |
| Firm\_age | 3,177 | 10.32515 | 8.241764 | 0 | 48 |
| Firm size |  |  |  |  |  |
| * 1 person
 | 3,177 | .7428392 | .4371376 | 0 | 1 |
| * 2 People
 | 3,177 | .1454202 | .3525795 | 0 | 1 |
| * 3-5 People
 | 3,177 | .0963173 | .2950723 | 0 | 1 |
| * More than 5
 | 3,177 | .0154234 | .1232488 | 0 | 1 |
| Firm sector |  |  |  |  |  |
| * Industry
 | 3,177 | .3119295 | .4633541 | 0 | 1 |
| * Commerce
 | 3,177 | .4063582 | .4912303 | 0 | 1 |
| * Service
 | 3,177 | .2817123 | .4499047 | 0 | 1 |

Source: Author

Table n°2 presents summary statistics for the variables used in the analysis, covering both the full sample of individuals and the subsample of entrepreneurs with available profit data.

According to the dataset used in this study, the average age of individuals in the sample is approximately 35.6 years, with a minimum of 15 and a maximum of 64 years (taking into account the participation in labor market). Women represent a slightly higher proportion of the sample (56.3%) compared to men (43.7%). Regarding educational attainment, a significant proportion of the sample has no formal education (56.3%), while only 6.9% have reached the tertiary level.

The distribution of residence shows a relatively balanced split between urban (52.7%) and rural (47.3%) areas. A notable proportion of individuals have parents who were also entrepreneurs: 59.7% report that their father was an entrepreneur, while 49.7% report the same for their mother.

On average, individuals report having spent around 15.9 months unemployed prior to their current activity, although this figure varies widely (standard deviation of 33.8 months, with a maximum of 480 months).

Focusing on the entrepreneurial subsample (n = 3177), the mean monthly profit is approximately 126.133 CFA francs, with a large standard deviation, indicating considerable heterogeneity in business performance.

Educational levels among entrepreneurs are even lower than in the full sample with 65.3% of informal entrepreneurs having no formal education, while only 1.35% have attained tertiary education. This pattern suggests a negative correlation between education level and engagement in informal entrepreneurship. Specifically, individuals with primary education represent 18.85%, and those with secondary education (both levels combined) account for approximately 14.5% of the sample. These statistics confirm that those with higher levels of education are less likely to engage in informal entrepreneurship, consistent with findings from Estrin et al. (2016), who argue that higher education, beyond secondary school, may not positively influence entrepreneurial entry. They explain that this may stem from higher opportunity costs, as well-educated individuals are more likely to secure formal wage employment—particularly in managerial roles—that offer decision-making autonomy and variable incentives, without the risks inherent in entrepreneurship.

Additionally, the informal sector in Benin is predominantly female, with 67.1% of entrepreneurs being women, which supports the argument of a gendered concentration in informal activities. This finding aligns with prior research showing higher female participation in informal labor markets (Galli & Kucera, 2004; Gallaway & Bernasek, 2002; Hoyman, 1987). Such overrepresentation is often explained by social norms and structural barriers, which limit women’s access to formal employment and confine them to low-skill, low-capital entrepreneurial ventures. These constraints often compel women to pursue informal entrepreneurship as a livelihood strategy rather than as an opportunity for economic advancement.

Furthermore, the vast majority of entrepreneurs in the sample entered the informal sector out of necessity rather than opportunity. Specifically, 94.4% of the entrepreneurs reported necessity as their main motivation, while only 5.6% identified opportunity as their reason for starting a business. This aligns with findings from the literature suggesting that necessity-driven entrepreneurship dominates in developing contexts, often reflecting limited access to formal employment rather than a proactive pursuit of business opportunities (Poschke, 2013; Günther & Launov, 2012).

Looking at business characteristics, 60% of informal enterprises operate in rural areas, while 40% are based in urban settings. Although informal activity is commonly associated with urban centers, this result likely reflects the prevalence of informal non-agricultural work in rural zones of Benin. It also suggests that informal entrepreneurship plays a key role in rural livelihoods beyond farming activities.

In terms of sectoral distribution, the data show that 40.6% of businesses operate in commerce, making it the most dominant sector. This is followed by 31.2% in industry and 28.2% in services. These figures are consistent with trends observed in sub-Saharan Africa, where informal commerce (e.g., market trade, resale) tends to absorb a large share of self-employed individuals, particularly women (ILO, 2018). The relatively smaller share of service-oriented businesses may be explained by barriers such as skill requirements or limited demand in certain areas.

Lastly, informal firms in the sample exhibit a relatively long lifespan, with an average firm age of 10.3 years. This finding indicates that even in the absence of formal protections or structures, many businesses manage to survive and adapt over time, underscoring the resilience of informal entrepreneurs.

**Results**

This study employs a Heckman two-step model to examine the determinants of entrepreneurial performance, taking into account potential selection bias in the decision to become an entrepreneur. The first stage models the probability of being an entrepreneur, while the second stage analyzes the determinants of entrepreneurial performance measured by the natural logarithm of monthly profit. On a sample size of 5737 individuals, 3177 individuals have been selected for this stage. Below are the results:

Table n°3: Regression results

|  |
| --- |
| Regression Results |
|  (1)  |
| Variables ln\_profit  |
| Age\_Entrepreneur 0.0723\*\*\* |
|  (0.0138)  |
|  |
| Age\_Entrepreneur2 -0.000904\*\*\* |
|  (0.000170)  |
| Gender |
| Male |
| Female -0.237\*  |
|  (0.137)  |
| Levels of Education |
| No education |
| Primary -0.000464  |
|  (0.0614)  |
|  |
| Secondary1 0.206\*\*\* |
|  (0.0792)  |
|  |
| Secondary2 0.341\*\*  |
|  (0.141)  |
|  |
| Tertiary 0.630\*\*  |
|  (0.248)  |
| Firm area of implementation  |
| Rural |
| Urban 0.0629  |
|  (0.0486)  |
| Reason of Entrepreneurship |
| Opportunity reason |
| Necessity reason -0.234\*\*  |
|  (0.0979)  |
|  |
| Number of working hours 0.00161\*\*\* |
|  (0.000563)  |
| Source of start-up capital |
| Inheritance  |
| Savings 0.0540  |
|  (0.0713)  |
|  |
| Loans/Microfinance credit 0.175  |
|  (0.305)  |
|  |
| Associate contribution -0.0817  |
|  (0.0530)  |
|  |
| Firm\_age 0.00910\*\*\* |
|  (0.00334)  |
| Sector of activity |
| Services |
| Industry -0.0238  |
|  (0.154)  |
|  |
| Commerce 1.011\*\*\* |
|  (0.154)  |
|  |
| sector experience 0.00150  |
|  (0.0112)  |
|   |
| General Experience 0.0139\*\*  |
|  (0.00543)  |
| Size of firm |
|  |
| Firm\_size==2People 0.233\*\*\* |
|  (0.0642)  |
|  |
| Firm\_size==3-5People 0.501\*\*\* |
|  (0.0790)  |
|  |
| Firm\_size==More than 5 0.788\*\*\* |
|  (0.182)  |
| Specific Training  |
| None |
| Specific Training -0.229\*  |
|  (0.138)  |
|  |
| Female#c.Workhour 0.00122\*\*  |
|  (0.000515)  |
|  |
| Industry#Female -0.230\*  |
|  (0.120)  |
|  |
| Trade#Female -0.498\*\*\* |
|  (0.121)  |
|  |
| Industry#Workhour 0.0000753  |
|  (0.000647)  |
|  |
| Commerce#Workhour -0.00130\*\*  |
|  (0.000601)  |
|  |
| Constant 9.188\*\*\* |
|  (0.364)  |
| ------------------------------------ |
| Entrepreneur  |
| Age 0.0237\*\*\* |
|  (0.00166)  |
| Gender |
| Male |
| Female 0.442\*\*\* |
|  (0.0384)  |
| Levels of Education |
| No education |
| Level\_Educ==Primary 0.00465  |
|  (0.0505)  |
|  |
| Level\_Educ==Second~1 -0.264\*\*\* |
|  (0.0582)  |
|  |
| Level\_Educ==Second~2 -0.930\*\*\* |
|  (0.0699)  |
|  |
| Level\_Educ==Tertiary -1.520\*\*\* |
|  (0.0937)  |
| Area of residence |
| Urban |
| Area\_residence==Rural -0.121\*\*\* |
|  (0.0381)  |
| Type of Entrepreneur’s father job |
| Others  |
| Dad\_Entrepren..0000 -0.0244  |
|  (0.0394)  |
| Type of Entrepreneur’s mum job |
| Others  |
| Mum\_Entrepren..0000 0.543\*\*\* |
|  (0.0385)  |
|  |
| time\_unemployed -0.0000562  |
|  (0.000541)  |
|  |
| Constant -0.944\*\*\* |
|  (0.0808)  |
| ------------------------------------ |
| /mills  |
| lambda -0.320\*\*  |
|  (0.152)  |
| ------------------------------------ |
| Observations 5720  |
| ------------------------------------ |

Standard errors in parentheses

\* p<0.10, \*\* p<0.05, \*\*\* p<0.01

**Selection Equation: Determinants of Entrepreneurial Entry**

Results of the Probit selection equation (lower panel of the table) reveal several factors significantly associated with the probability of being an informal entrepreneur.

The results reveal that age positively influences the likelihood of becoming an entrepreneur, with older individuals being more likely to engage in entrepreneurial activities. So, the opportunity to start a business increase with age because of higher accumulated physical, social, and human capital (Lee and Vouchilas 2016).

Female individuals are significantly more likely to be entrepreneurs. This finding aligns with some evidence suggesting that women are more likely to engage in necessity-driven entrepreneurship, especially in developing countries and informal sectors. Minniti and Naudé (2010) argue that in many developing economies, women’s participation in entrepreneurship is shaped less by opportunity and more by the lack of alternative employment options. Structural inequalities in access to formal employment often lead women to start businesses out of necessity, particularly in the informal sector. Similarly, Gindling and Newhouse (2014) find that in Sub-Saharan Africa, self-employment rates are higher for women partly because of barriers to entry in the wage labor market, such as discrimination, family responsibilities, or lack of formal education. And let’s remind that in the context of Benin, informal sector is predominant by self-employment (refer to descriptive Stats). This finding is also consistent with Chen et al. (2005), who show that female entrepreneurs are overrepresented in lower-capital, labor-intensive sectors, often operating informally or from home. Such businesses, while often less profitable, offer the flexibility that formal jobs cannot. In Beninese context, Baliamoune-Lutz and McGillivray (2009) highlight that women often turn to entrepreneurship as a means of economic survival, and the informal sector provides more flexible work arrangements that accommodate household responsibilities.

Plus, results indicate that higher levels of formal education are significantly associated with a reduced likelihood of becoming an informal entrepreneur. Specifically, individuals with secondary and tertiary education are markedly less likely to engage in informal entrepreneurial activities. This finding aligns with the literature suggesting that education expands access to formal wage employment, thereby reducing the necessity to engage in self-employment out of economic compulsion (Van der Sluis, van Praag, & Vijverberg, 2008; Gindling & Newhouse, 2014). In Benin context, where formal employment opportunities remain limited, highly educated individuals may still opt for entrepreneurship, but this is often as a secondary or fallback option when their job aspirations are unmet. Additionally, residing in a rural area significantly reduces the probability of engaging in entrepreneurial activity. This result is maybe contradictory but can be explained by the fact that agricultural self-employment is not captured in the data. That type of activity is overrepresented in rural areas. This may also reflect the relative scarcity of entrepreneurial opportunities, infrastructure, and market access in rural settings compared to urban centers. It could also signal a concentration of informal wage labor.

The coefficient for prior unemployment duration (time\_unemployed) is negative but statistically insignificant (p = 0.957), indicating no meaningful relationship between time spent unemployed and the probability of becoming an entrepreneur in Benin’s informal sector. This result suggests that, in Benin, entrepreneurship is not primarily a refuge from unemployment. The finding implies that informal entrepreneurial entry may be driven more by family influence. Having a mother who was an entrepreneur significantly increases the likelihood of entrepreneurial entry, suggesting the importance of intergenerational influence and role models.

**Outcome Equation: Determinants of Informal Enterprise Performance**

The second stage models firm performance using the log of monthly profit as the dependent variable.

In the outcome equation, age and its squared term indicate a nonlinear (inverted U-shaped) relationship with profits, suggesting that profitability increases with age up to a certain point before declining. This pattern suggests that middle-aged entrepreneurs are likely to perform better than their younger or older counterparts. Initially, as entrepreneurs age, they accumulate valuable human capital, experience, social networks, and sector-specific knowledge that contribute positively to business outcomes (Lévesque & Minniti, 2006). However, beyond a certain age, performance declines, due to some reasons cited in the literature. In a study comparing successful and unsuccessful entrepreneurs, Brockhaus (1980) found that successful entrepreneurs were, on average, 13 years younger than their unsuccessful counterparts. He speculated that “older… entrepreneurs may not have had sufficient energy to devote to their fledging enterprise”. Also, some authors explain this result by psychological and cognitive characteristics of older entrepreneurs. Older adults tend to be slower in acquiring certain types of skills, including technical skills (Gist et al., 1988). Cognitively, older executives are not as facile at understanding new ideas or integrating new information and are more committed to the status quo (Hambrick and Mason, 1984). Supporting this view, Gielnik et al. (2012) found that older business owners tend to focus less on future opportunities, leading to slower firm growth.

However, contrasting findings are reported by Zhao et al. (2021), who identify a U-shaped relationship between age and entrepreneurial success. They argue that the nature of entrepreneurial careers characterized by unique resource demands, job responsibilities, and success metrics may favor individuals at both younger and older life stages, unlike traditional career paths that typically reward middle-aged experience.

To identify the age at which performance peaks, the turning point is calculated using the standard formula for the vertex of a parabola:

$Turning point \left(optimal age\right)=-\frac{β\_{1}}{2β\_{2}}$

$Turning point \left(optimal age\right)=-\frac{0.0724}{2\*\left(-0.00091\right)}≈39.95$

So, entrepreneurial performance peaks at approximately 40 years old. Up to this point, accumulating experience and knowledge tends to enhance performance. Beyond it, various age-related constraints may begin to offset these benefits, underscoring the importance of age-sensitive support policies for entrepreneurs.

Education plays a significant role in enhancing entrepreneurial performance. Individuals with higher levels of education (particularly secondary and above) exhibit significantly higher profits, indicating that education improves managerial skills and decision-making capabilities.

This suggests that education contributes positively to entrepreneurial capacity, likely through the development of cognitive, managerial, and strategic skills (Colombo & Grilli, 2005; Lanjouw & Lanjouw, 2001). Tertiary-educated entrepreneurs, in particular, may benefit from greater access to market information, better financial literacy, and enhanced networking, which together improve their business outcomes.

The analysis also reveals a pronounced gender gap in performance. Women earn about 24% less in profit than men; male-run enterprises tend to perform better than those led by women. This finding is consistent with a number of studies that have examined and compared the performance of male- and female-owned businesses (Cooper et al., 1994; Brush, 1992; Loscocco & Robinson, 1991; Chaganti & Parasuraman, 1996). One explanation frequently cited in the literature is that women often face trade-offs between participating in the labor market and fulfilling domestic responsibilities. Indeed, women are subject to multiple constraints, including cultural norms that restrict their mobility or isolate them within male-dominated environments. Additionally, women frequently encounter difficulties in developing business networks (Bardasi, Sabarwal, & Terrell, 2011).

The liberal feminist theory (Fischer, Reuber, & Dyke, 1993) suggests that female-owned small and medium-sized enterprises (SMEs) may underperform due to overt discrimination or systemic barriers that limit women's access to crucial resources such as education and business experience. In contrast, social feminist theory (Fischer et al., 1993) posits that men and women differ inherently in their approaches to entrepreneurship. These differences do not imply that women are less effective, but rather that they may adopt alternative strategies, which may or may not be equally effective compared to those of men.

In the context of Benin, these disparities can be partly explained by the dual burden that women face in balancing professional activities with domestic chores and childcare. Moreover, the majority of women engaged in the informal sector have little to no formal education, and as a result, tend to be concentrated in survival-level trades such as selling phone credits, condiments, or running small retail and service businesses. In contrast, men often the primary income earners in their households tend to devote more time to their businesses. They are also generally better educated and are more likely to operate in higher-earning sectors such as real estate, construction, and transportation.

Moreover, specific training in entrepreneurship showed only marginal effects. This finding echoes the results of prior research, which has shown that entrepreneurship-specific training often produces only marginal improvements in economic outcomes. These limited effects raise important questions about the design, relevance, and delivery mechanisms of training.

Traditionally, most training programs have relied on classroom-based formats, which may not be well-suited to the needs of informal entrepreneurs, particularly in resource-constrained contexts. However, the field is evolving. Recent studies emphasize the potential of more interactive and contextually grounded approaches, including exposure to successful role models (Lafortune et al., 2018), peer learning environments (Dalton et al., 2019), and individual coaching or mentoring (Bardasi et al., 2021). These innovations suggest that the quality, intensity, and mode of delivery of training are critical to translating skills into improved business outcomes.

Moreover, as Cho et al. (2013) point out, even when training successfully imparts targeted skills, it may fail to yield positive economic outcomes. This can occur if the value of acquired skills does not offset opportunity costs such as lost earnings or time away from productive activities—or if training inadvertently leads beneficiaries to shift into less profitable sectors. In such cases, programs may appear successful in terms of pedagogy, but fail to generate realvalue for participants.

In Benin context, this may be especially true for informal entrepreneurs who operate under significant resource and time constraints. If the training is not sufficiently tailored to their realities or if it lacks practical relevance its effectiveness is likely to be muted. This underscores the need for context-specific training models that are not only pedagogically sound but also economically viable for participants.

Work effort, measured by the number of hours worked, positively impacts profits. This suggests that entrepreneurs who devote more time to their businesses tend to earn higher returns. This finding aligns with the intuitive understanding that effort and time commitment are critical inputs in business success, particularly in the informal sector where capital and technology are often limited. Empirical evidence supports this. For example, De Mel, McKenzie, and Woodruff (2009) find that hours worked are strongly correlated with firm performance among micro-entrepreneurs in Sri Lanka. In Ghana, Akoten et al. (2006) observe that those who dedicate more time to their businesses are able to build stronger customer relationships and improve product offerings, thus enhancing profits. From an economic standpoint, this result supports standard microeconomic production theory, which posits that labor input (in this case, hours worked) contributes positively to output and income—at least up to a certain point. It also resonates with the idea that entrepreneurs in developing countries often rely heavily on personal labor due to limited access to skilled labor, formal financing, or productivity-enhancing technologies (Grimm, Krüger & Lay, 2011).

However, while the positive association is expected, it's important to interpret it carefully. The result does not necessarily imply causality that working more hours directly causes better performance. Importantly, interaction effects reveal that women benefit more from increased work hours, suggesting that time constraints may be a binding constraint for female entrepreneurs. When women are able to allocate more hours to their business activities, the return on that investment of time is comparatively higher than for their male counterparts. This is consistent with findings from Bardasi, Sabarwal, and Terrell (2011), who show that gender disparities in productivity can largely be explained by time availability and sectoral concentration.

Moreover, the effect of working hours varies significantly across sectors, indicating that the marginal productivity of time is not uniform. The negative and statistically significant interaction between workhour and the commerce sector indicates that the marginal returns to additional working hours are lower in commerce compared to service sector. In other words, for entrepreneurs in commerce, working longer hours may not translate into higher profits, and could even lead to diminishing returns or inefficiencies. This aligns with evidence from Fafchamps et al. (2014) and De Mel et al. (2009), who found that in highly competitive informal markets, simply increasing labor input (hours worked) does not always improve performance, especially where capital or demand is the main constraint.

Motivation for entrepreneurship also matters. Individuals who enter entrepreneurship out of necessity tend to earn significantly less, corroborating evidence that opportunity-driven entrepreneurs generally outperform necessity-driven ones (Amorós & Bosma, 2014; Block & Sandner, 2009). Necessity entrepreneurs often operate in low-barrier sectors, with limited resources or networks, and may be constrained in their growth potential. In contrast, opportunity entrepreneurs typically have better preparation, higher risk tolerance, and greater strategic orientation.

Firm characteristics are strong predictors of success. Older firms and those with larger sizes exhibit higher profitability, consistent with findings by McKenzie and Woodruff (2014), who show that business age and scale are key indicators of productivity and survival in developing countries. This reflects the benefits of accumulated knowledge, stable customer bases, and greater economies of scale.

Interestingly, while general experience enhances profitability, sector-specific experience does not. This may suggest that general entrepreneurial know-how, such as financial literacy or management skills, is more transferable and valuable than technical expertise narrowly confined to one domain (Gindling & Newhouse, 2014).

These findings call for a rethinking of support programs, particularly those related to training and education, which we now explore through concrete policy recommendations.

* Target skills development and training reform: The marginal or negative association between specific training and profits suggests a need to rethink the design and delivery of entrepreneurship training programs. Training must be aligned with sector-specific realities and market needs and should go beyond classroom-based methods. Incorporating hands-on coaching, mentoring, and peer learning, as seen in successful interventions (e.g., Dalton et al., 2019; Lafortune et al., 2018), may enhance practical relevance and effectiveness.
* Gender-Sensitive Entrepreneurship Support: Women constitute 67% of informal entrepreneurs and tend to operate in lower-profit sectors like commerce. However, the analysis shows that women benefit more from increased working hours, suggesting that relaxing time constraints (e.g., through childcare support or flexible financing) could boost their returns. Moreover, tailored financial and capacity-building support for women-led businesses in non-traditional sectors (e.g., industry) can help diversify income sources and reduce gender disparities.
* Support for Opportunity-Driven Entrepreneurship: With over 94% of entrepreneurs driven by necessity, policy should focus on creating more enabling environments for opportunity-based entrepreneurship. This includes expanding access to startup capital, improving vocational and tertiary education, and promoting youth employment initiatives that offer attractive alternatives to subsistence self-employment.
* Encouraging Sectoral Diversification: Commerce dominates the informal sector (40.6%), yet industry appears more profitable. Policies should incentivize shifts toward higher-value-added sectors, possibly through tax incentives, access to production equipment, and training in technical skills.
* Rural Entrepreneurship Development: Given that 60% of firms operate in rural areas, there is a need to boost rural enterprise productivity through infrastructure investments (e.g., roads, electricity), decentralized business services, and sector-specific support, particularly in agro-processing and rural industries.

**Conclusion**

This study underscores the pivotal role that human capital plays in the performance of informal entrepreneurs in Benin. Among the various components of human capital, formal education emerges as a particularly influential factor. Entrepreneurs with higher levels of education, especially those with secondary education, tend to achieve better business outcomes, suggesting that education provides foundational skills such as literacy, numeracy, and problem-solving, which are essential for managing and growing a business. This evidence reinforces the importance of expanding access to quality education beyond the primary level, particularly for marginalized groups such as women, who remain overrepresented in the informal sector and are concentrated in lower-performing sectors. In contrast, while general work experience significantly contributes to profitability, sector-specific experience and formal vocational training do not show a consistent or significant positive impact. The negative or marginal effect of specific training may point to a misalignment between the content of training programs and the practical needs of informal entrepreneurs. These findings suggest that simply offering training is insufficient unless it is relevant, context-specific, and well-aligned with market demands. Furthermore, the dominance of necessity-driven entrepreneurship reflects structural barriers to formal employment and opportunity-based ventures. Addressing these constraints through targeted education, tailored training, and improved access to resources can enhance the productivity and sustainability of informal enterprises and support inclusive economic development.

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