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Abstract

Access to finance is perceived as one of the major problems facing businesses in Sub-Saharan Africa, as well as the structures that support them in their development. This paper aims to measure the probability that a support structure with given characteristics, specific services to entrepreneurs and some technical capacities will face large-scale financial problems. We estimate a multinomial logistic model using a pool of disaggregated data collected by the Nkafu Policy Institute in a survey of 79 business support structures in Burkina Faso, Cameroon and Ghana in 2021. Our results show that the financial health of a business support structure is not fundamentally dependent on the duration of support, but rather on other factors related to the quality of services offered to entrepreneurs.

Keywords: Duration of support; Financial Health of Businesses; Sub-Saharan Africa, Multinomial logit model.

JEL Classification : C13, C25; M20 ; O10 ; O30 ; O55

1. Introduction

The focus of this study on assessing the effects of the duration of support on the financial health and funding model of business structures is motivated by three strands in the policy and scholarly literature, notably: (i) growing unemployment concerns in Africa and the need for businesses to be supported in the private sector to create the much-needed employment avenues to accommodate the corresponding rising population; (ii) the importance of supporting businesses in the achievement of inclusive and growth-oriented sustainable development indicators (SDIs) and (iii) the imperative to fill gaps in the extant contemporary literature on social innovation in developing countries through business support. The underlying strands are expanded in the same chronology as highlighted.

First, Africa is projected to account for a substantial fraction of the population in the world by 2030: the continent, which represented 20% of the world's population in 2012, is projected to represent about 33.33% of the global population by 2050 (AfDB, 2015). To avoid social unrest and corresponding negative externalities, it has also been projected that the corresponding unemployment resulting from the rising population has to be accommodated by the private sector as opposed to the public sector (Asongu, 2013). Accommodating such unemployment by the private sector would require, *inter alia*, support for businesses in the attendant sector, not least, because such support is related to the achievement of some SDIs.

Second, the support for businesses has been documented to be essential in the drive toward sustainable development goals (SDGs) (De Bernardi & Azucar, 2020; Haugh, 2020; Kouam & Asongu, 2021). In essence, support structures and training are relevant to enhancing the competitiveness and productivity of companies. The training programs such as *inter alia*, organization of workshops, training camps, and acceleration programs, which are apparent in the United Nations' SDG4 (which aims to ensure equal access to quality education for all and promote lifelong learning opportunities), are clearly articulated in the present study. Moreover, to increase room for practical implications, the study integrates a "time" dimension in the programming of training for entrepreneurs such that the beneficial effect from the training of entrepreneurs is contingent on time to guarantee the financial sustainability of the support structure providing the training.

Third, consistent with Kouam and Asongu (2021), the extant literature on the importance of factors underpinning sustainable development in driving social innovation and doing business has largely focused on, *inter alia*: the importance of education and university incubation in the achievement of SDG 4 pertaining to inclusive and equitable education of quality as well as the enhancement of lifelong avenues for all (Fleaca *et al.*, 2018; Kumari *et al.*, 2019); the empowerment and inclusion of groups that are vulnerable, especially women in accordance with SDG5 on the empowerment of girls and women as well as the achievement of gender equality (Tchouassi *et al.*, 2018; Tchamyu *et al.*, 2021); challenges of doing business as well as the importance of doing business for inclusive development in Africa (Asongu & Odhiambo, 2019a, 2019b); development of organisational practices and strategies, consistent with SDG 8 on promoting inclusive, sustained and sustainable economic prosperity, decent work for all as well as productive and full employment (Jolink & Niesten, 2015; Stubbs, 2017; Ayuso, 2018; Lotfi *et al.*, 2018); ability and willingness to promote innovation, consistent with SDG 9 on building infrastructures that are resilient, promoting industries that drive sustainable innovation (Belz & Binder, 2017; Fischer *et al.*, 2018; Ploum *et al.*, 2018; St-Jean & Labelle, 2018) and encouragement of businesses that are friendly to the environment, in accordance with SDG 13 on the urgency to take action towards addressing concerns surrounding climate change and its consequences (Achuo *et al.*, 2021; Asongu & Salahodjaev, 2021).

As critically engaged in Section 2, the extant contemporary literature on the promotion of social innovation in developing countries by means of business support and incubation has not focused on the problem statement being considered in this study. The study in the literature closest to this present inquiry is Watts and Scales (2020), which has focused on nexuses between social impact investing (SII), agriculture, and financialization of development in sub-Saharan Africa. The underlying study has concluded that, *inter alia*, SII in African agriculture: (i) has grown over the past decade; (ii) is driven by both ethical and financial motives; (iii) is contributing to bringing new actors to the development of the sector; (iv) has focused on a narrowed set of regions and countries and (v) is altering the activities and nature of extant actors of development.

In the light of the above, the positioning of Watts and Scales (2020) is consistent with the present study in that both papers explore how SII engenders measurable business and social impacts in SSA. Beyond this similarity, the present study has three main distinctive features when compared to the

underlying study: (i) it broadens the perspective from the agricultural sector to a plethora of sectors (livestock, digital, energy, water and sanitation, health, trade and transport); (ii) departs from more general perspectives based on data collected before 2015 and by extension, before the advent of SDGs and (iii) as opposed to exclusively literal views, empirical insights are provided in this study, given that the first four sections of Watts and Scales (2020) are focused on historical perspectives, conceptual clarifications and broader notions of business support, while only the last section before the concluding (i.e., section 5) is specifically devoted to sub-Saharan Africa (SSA), with a survey of pre-2016 literature for the most part.

In the light of the above, the purpose of this study is to assess the influence of duration of support on the financial health of businesses in selected countries in SSA. The focus on the selected countries is motivated by data availability constraints at the time of study as well as gaps in the extant literature. The research objective is to measure the probability that a support structure with given characteristics, specific services to entrepreneurs and some technical capacities will face large-scale financial problems, such that policy makers are provided with specific actionable reforms needed to improve the financial health of business support organizations.

The rest of the study is organized as follows. A brief review of the literature is covered in Section 2, while the methodology and data are discussed in Section 3. Section 4 presents the empirical findings, while Section 5 concludes with implications and future research directions.

2. Brief Review of the Literature

The extant literature on the promotion of social innovation in developing countries can be discussed in three main strands, notably: (i) the role of factors underlying education and university education in driving social innovation by means of business promotion and (ii) the relevance of sustainable infrastructures in boosting social innovation and by extension, the performance of social enterprises (Kouam & Asongu, 2021; Adu-Gyamfi *et al.*, 2022). These two strands are discussed in chronological order.

In the first strand on the importance of education in promoting entrepreneurship for social innovation, there is some consensus that specific skills are needed by social entrepreneurs for

targeted development goals to be achieved and improve societal added value (Cohen & Winn, 2007; Katsikis & Kyrgidou, 2009; Hockerts & Wüstenhagen, 2010; Lans *et al.*, 2014; Kouam & Asongu, 2021). Moreover, while less focus is placed on social entrepreneurship in developing countries compared to their developed counterparts, improvements have been apparent in recent years (Verzat, 2012).

Lasrado *et al.* (2016) have examined how university incubators impact the performances of start-ups to establish that beyond the incubation period, compared to non-university incubators and, by extension, non-incubated firms, firms that are incubated in universities continuously improve. The nexus between economic development and entrepreneurial knowledge is assessed by Tchouassi *et al.* (2018) concerning women's and youth empowerment to show that when entrepreneurial knowledge is identified and consolidated in youth and women, such promotes autonomy as well as a solid base for entrepreneurial and economic developments. Kumari *et al.* (2019) assess the relevance of these higher education institutions in creating, promoting, and sustaining social innovation and conclude that collaborative learning should be actively encouraged in HEIs, especially by means of systematic change and open collective action platforms for more entrepreneurial actions that are consistent with social needs.

The second strand on the relevance of social innovation and the performance of social enterprises can be discussed in three main categories: (i) internal factors to social enterprising such as information and communication technology (ICT), business climate, and training of small and medium-sized (SME) managers to boost social innovation (Safoulanitou *et al.*, 2013); these factors are research and development, as well as reproduction, adoption, and adaptation to technologies and methods that are working elsewhere (El Eljouis & Abassi, 2019); El Elj (2014) argues that the size of the company determines the underlying drivers given that the company can leverage on economies of scale to increase the relevance of documented determinants in social innovation; the importance of business size is also supported by Adeyeye *et al.* (2015) while Cheah and Ho (2019) articulate, respectively the relevance of the start-up ecosystem in such an innovation process; managerial skills are also articulated by Almeida and Fernande (2008) and Christensen *et al.* (2017). (ii) With respect to external factors, Cheah *et al.* (2016) and Kavita *et al.* (2020) put emphasis respectively on the role of public action and government funding in driving the identified internal

factors. Keller (2004) argues for economic openness while Yuriy *et al.* (2010) and Ayyagari *et al.* (2011) posit the role of exporting companies in driving such innovation.

(iii) In terms of barriers to social innovation, some of the documented factors include lack of adequate training, poor ICT infrastructure, lack of access to finance and bureaucracy (Hadjimanolis, 1999); technical inefficiency, poor technology, weak institutional support and poor managerial skills (Clancy, 2001). According to Lim and Shyamala (2007), external barriers are more important than internal barriers, which in increasing order of importance are: economic-related, information-oriented, and skill-related. Safoulanitou *et al.* (2013) identify constraints in financing as the main challenge to innovation, while Rahmouni (2014) argues that dependence on third-party technology agencies is linked to innovation barriers.

3. Methodology and Data

3.1 Methodology

The model applied for this study is one of the most widespread discrete choice models used in many different fields (McFadden & Hausman, 1984), namely the multinomial logit model. The multinomial logit model is used to relate a categorical response to independent variables. The response can be divided into two or more categories. Depending on a number of characteristics, it is usually possible to determine the probability that an observation belongs to a category. This model is used in a wide variety of fields and its effectiveness is recognized by numerous works in the literature. This is the case of James *et al.* (2013) who apply logistic regression to determine whether a credit card customer is likely to be overdrawn or not; or Hosmer *et al.* (2013) who determine the presence or absence of coronary heart disease in patients according to their age; Kumar *et al.* (2015) use logistic regression and above all, introduce the position as an explanatory variable. Overall, it is a gold standard model for predicting click-through rates (Chapelle *et al.*, 2015). Lee *et al.* (2012) and Baqapuri and Trofimov (2014) also propose to use this model to deal with the nesting of categorical variables. Several other authors have used it for resource selection based on the movement of individuals (Forester *et al.*, 2009; Craiu *et al.*, 2008; Craiu *et al.*, 2011). By assigning a value of 1 to visited locations and a value of 0 to non-visited locations, they show that a logistic regression model can be fitted to the data to determine the resources most sought after by individuals.

This disaggregated model seeks to study the choice or the perception of the value of an event among a set of mutually exclusive alternatives. Individual choice behavior or the perceptions of the value of an event are considered as selection processes between several mutually exclusive alternatives that belong to a set of alternatives. The eventuality chosen by a given organization will be the one that optimizes its objective function. The decision taken will thus be the result of an optimization process reflecting a rational behavior of this organization. In our model, we define the objective function of a business support structure by its perception of the risk of having good or bad financial health.

We thus seek to model and explain the financial health of business support structures conditionally to their occurrences according to the specific circumstances of the organization. These circumstances are based on the spatio-temporal characteristics of the structure, the type of services it offers to companies, but also its technical capacities. The multinomial Logit model will thus allow us to estimate the probability that a support structure i has a financial situation j in given circumstances characterizing both its service provision and its internal capacity. This probability can be expressed as a linear (or non-linear) function of a number of variables characterizing the socio-economic characteristics of the structure i (X_{ik}), its service provision (S_{ih}), and its internal capacity (I_{il}).

Formally, this probability is written as follows:

$$P_{ij} = F_{ij} \left(\alpha_0 + \sum_{k=1}^K \alpha_k X_{ik} + \sum_{h=1}^H \beta_h S_{ih} + \sum_{l=1}^L \rho_l I_{il} \right) \quad (1)$$

P_{ij} is the probability that a support structure i with given characteristics, offering specific services to entrepreneurs and having a certain internal capacity has a limited or robust financial situation j . The parameters α_k , β_h and ρ_l are unknowns that we seek to estimate. They reflect respectively, the weight of each explanatory variable (X_{ik} , S_{ih} and I_{il}) in the determination of the probability is a distribution function of the explanatory variables and the vector of parameters α_k , β_h and ρ_l . This probability will be calculated after having estimated the parameters α_k , β_h and ρ_l .

The objective function takes the following form:

$$T_{ij} = W_{ij}(X_{ik}, S_{ih}, I_{il}) + \varepsilon_{il} \quad (2)$$

The objective function T_{ij} thus comprises two components, one deterministic and the other random. The deterministic function (W_{ij}) reflects the perception of an accompanying structure of its situation. It can take several forms, but the linear form is the simplest to estimate and interpret:

$$W_{ij} = \alpha_{0j} + \sum_{k=1}^K \alpha_k X_{ik} + \sum_{h=1}^H \beta_h S_{ih} + \sum_{l=1}^L \rho_l I_{il} \quad (3)$$

The endogenous variable we are trying to explain is a qualitative and discrete variable. It indicates the plans put in place by the support structures to ensure the financial health of their organization. This variable takes unordered integer values that vary between 0 and 4. These values taken by the endogenous variable have a particular hierarchy that would allow each support structure to choose exactly the level that suits it.

$y = 1$: Limited plans or actions taken to raise funds. High dependence on 1 or 2 funders of the same type. Inadequate accounting to assess financial health.

$y = 2$: Strong plans to pursue multiple and varied funding sources, with strong partnerships and funding in place or underway. Financial statements are regularly updated and provide an accurate picture of financial health.

For individual i , we define the probability π_i (we also speak of a posteriori probability) and the logistic form of the model is written:

$$\pi_i = \frac{\exp(W_{ij})}{1 + \exp(W_{ij})} \quad (4)$$

By respecting the laws of probability such as: $0 < P_{ij} < 1$ and $\sum_{j=1}^J P_{ij} = 1$

The probability associated with the J^{e-1} indexed alternative J does not need to be specified since it can be calculated from the rest of the calculated probabilities:

$$(5)$$

$$J = 1 - \sum_{j=1}^{J-1} P_{ij} = \frac{1}{1 + \sum_{j=1}^{J-1} W_{ij}}$$

To better interpret the results to be obtained, it is necessary to express the probability of each alternative with respect to a reference situation (for example J).

For all, $j = \{1, \dots, j-1\}$ we will have to calculate the ratio between the probability of the occurrence of the alternative j and that of the alternative J:

$$\frac{P(j/W_i)}{P(J/W_i)} = \frac{\exp(W_{ij})}{\exp(W_{iJ})} \Rightarrow \text{Log} \left(\frac{P(j/W_i)}{P(J/W_i)} \right) = \sum_{k=1}^K (\alpha_{kj} - \alpha_{kJ}) X_{ik} + \sum_{h=1}^H (\beta_{hj} - \beta_{hJ}) V_{ih} + \sum_{l=1}^L (\lambda_{lj} - \lambda_{lJ}) R_{jl} + \sum_{m=1}^M (\mu_{mj} - \mu_{mJ}) E_{jm} \quad (6)$$

To properly identify the model, we must impose a restriction on the parameters of the reference situation (J). We assume that their coefficients are zero:

$$\alpha_{kJ} = \beta_{hJ} = \lambda_{lJ} = \mu_{mJ} = 0 \quad (7)$$

$$\text{Log} \left(\frac{P(j/W_i)}{P(J/W_i)} \right) = \sum_{k=1}^K \alpha_{jk} X_{ik} + \sum_{h=1}^H \beta_{jh} V_{ih} + \sum_{l=1}^L \lambda_{jl} R_{jl} + \sum_{m=1}^M \mu_{jm} E_{jm}$$

We see here that the probability ratio between the two alternatives j and J does not depend on the other possible alternatives.

When only one explanatory variable varies (for example, we go from X_{k0} to X_{kl}), while keeping the other variables constant, we can measure its effect on the effect on the probability ratio between the observed alternative and the reference alternative.

$$\text{Log} \left(\frac{P(j/X_{k0})}{P(j/X_{kl})} \right) = \text{Log} \left(\frac{P(j/X_{k0})}{P(j/X_{k0})} \right) - \text{Log} \left(\frac{P(j/X_{kl})}{P(j/X_{k0})} \right) = \alpha_{jk} (X_{k0} - X_{kl}) \quad (8)$$

$$\frac{\partial \text{Log} \left(\frac{P(j/X_{k0})}{P(j/X_{kl})} \right)}{X_k} = \alpha_{jk} \quad (9)$$

α_{jk} measures the effect of changing the variable X from X_{k0} to X_{kl} on the probability of occurrence of an accident of severity j rather than severity J.

3.2 Data

The variables used in this study refer in particular to the key services offered by the entrepreneurial support structures to help them develop their businesses as well as their technical capacities (Robinson & Stubberud, 2014; Ahmad & Thornberry, 2018). Our sample is made up of 79 support structures identified as a result of a survey carried out by the Nkafu Policy Institute in 2021 as part of a project on social entrepreneurship for sustainable development in SSA, the purpose of which is to analyze support practices for social enterprises in Cameroon, Burkina Faso and Ghana. The data for each structure presents detailed information on the support structure including the structure's specificities (affiliation, business model, gender of the founder, gender of the current leader, duration of support), the services offered by the support structure to its entrepreneurs to help them develop their businesses (training, networking, *inter alia*); as well as the technical capacities of the incubator.

To estimate the probability of exposure of a support structure i (such as $i = 1, 2, \dots, 79$) to a bad financial health j (such as $j = 1, 2$), it is necessary to cross-tabulate the multinomial variable y with a number of explanatory variables that can be quantitative and continuous or qualitative and discrete. The endogenous variable is an unordered multinomial variable that will be scored from 1 to 2 to indicate the financial situation of the support structure. As mentioned above, it will be illustrated by the following system:

- $y = 1$: Limited plans or actions taken to raise funds. High dependence on 1 or 2 funders of the same type. Inadequate accounting to assess financial health.
- $y = 2$: Strong plans to pursue multiple and varied funding sources, with strong partnerships and funding in place or underway. Financial statements are regularly updated and provide an accurate picture of financial health.

Based on the available data, we selected and classified these variables according to the characteristics of each component of the system. These exogenous variables chosen to specify our models are also selected with reference to studies on business support covered in Section 2. These variables are illustrated provided in Appendix 1.

4. Presentation of results

Table 2 presents the estimated values of all the weighting parameters for the various explanatory variables included in the multinomial Logit model as well as their standard deviations. For each explanatory variable, including the constant, we estimate the level-specific weight indicating the financial health of the facility. Most of the variables used in the estimation of the model are statistically significant at the 1% to 10% levels. The coefficients for the reference situation have been omitted since they are assumed to be zero.

For variables that are insignificant in one specification (*Limited Financial Health* for example) and significant in the other, the coefficient cannot be considered zero. Therefore, there is room for the possibility that a modification of this variable affects the financial health and funding model of the given support structure. The positive sign of the coefficients of certain variables implies that they have a positive effect on the probability of a given support structure having a limited rather than a robust financial situation. Otherwise, the effect will be rather negative.

According to McFadden and Hausman (1984), several indicators of model fit have been developed to evaluate the predictive capacity of the model. These include the Pseudo R² and the Log likelihood statistic. Moreover, results also depend on the type of software used. In our case, the Eviews 10 software was used, and only the Log likelihood statistic was calculated. Their values show that, overall, the selected explanatory variables explain to a large extent the financial situation of a support structure, whether it is limited or robust.

Table 2. Estimated probability that a supporting organization is at risk for limited or strong financial health

Explained variables	Components	Coefficients	
		Limited Financial Health	Strong Financial Health
<i>Dursup</i>	(X_1)	0.0197 (0.046)	-0.038 (0.043)
<i>Gendcl</i>	(X_2)	-0.069 (0.1138)	-0.239*** (0.086)
<i>Wshps</i>	(S_1)	0.207*** (0.073)	0.1047 (0.084)
<i>B2B</i>	(S_2)	0.136*** (0.064)	-0.085 (0.056)
<i>Mentor</i>	(S_4)	-0.129*** (0.043)	0.107* (0.06)
<i>Process</i>	(S_5)	-0.242*** (0.063)	0.342*** (0.075)
<i>Afin</i>	(S_6)	0.072* (0.039)	-0.118* (0.071)
<i>Bootp</i>	(S_7)	-0.162** (0.066)	0.078** (0.033)
<i>Genincl</i>	(S_8)	0.285*** (0.047)	0.126** (0.045)
<i>Brand</i>	(I_1)	0.207*** (0.054)	0.029 (0.077)
<i>Finmag</i>	(I_2)	0.446*** (0.094)	-0.111* (0.061)
<i>Team</i>	(I_3)	-0.217** (0.080)	0.057 (0.097)
<i>Constant</i>		0.635* (0.318)	2.930*** (0.452)
Observations		36	43
Log likelihood		-2.559	-6.633

Note: Workshops (*Wshps*); Mentorship Program (*Mentor*); B2B Connections (*B2B*); Business Processes (*Process*); Gender and Inclusion (*Genincl*); Leadership Team (*Team*); Gender and Inclusion (*Genincl*); Leadership Team (*Team*); Communications and Branding (*Brand*); Financial Management (*Finmag*); Bootcamps (*Bootp*); Gender of the founder (*Gendcl*); Duration of support (*Dursup*); Access to finance (*Afin*). Standard errors in parentheses. ***, **, *: significance levels at 1%, 5% and 10% respectively. Source: Authors

The estimated values of the coefficients cannot be interpreted directly and do not express the effect of each explanatory variable on the financial situation of a given support structure. They tell us only about the direction of the change in probability, not the magnitude. Interpreting these effects is much

more difficult than in the case of linear regression models, where the weights directly measure the effect of a unit or relative change in the explanatory variable on the variable being explained.

This interpretation is indeed made in relation to a precise reference situation, but the choice of the alternative can be made randomly, especially in the case of an unordered multinomial Logit model (Thomas, 2000). This reference situation can be one where the financial situation of the support structure is limited or even robust. The reference situation is the one that corresponds to robust financial health. Taking this situation into account will make it possible to measure the effect of the variation of an explanatory variable not on the probability of occurrence of a given financial situation, but on the probability of being the target of a limited financial situation rather than benefiting from a robust financial health. The coefficients for the reference situation have been omitted because they are assumed to be zero.

Table 3: Probabilities of the estimated weights in the multinomial logit model.

Explained variables	Components	Marginal effects	Variations (en %)
<i>Dursup</i>	(X_1)	1.019	1.9
<i>Gendcl</i>	(X_2)	0.933	-6.7
<i>Wshps</i>	(S_1)	1.229	22.9
<i>B2B</i>	(S_2)	0.145	85.5
<i>Mentor</i>	(S_4)	0.137	86.3
<i>Process</i>	(S_5)	1.273	27.3
<i>Afin</i>	(S_6)	1.074	7.4
<i>Bootp</i>	(S_7)	0.850	15
<i>Genincl</i>	(S_8)	1.329	32.9
<i>Brand</i>	(I_1)	1.229	22.9
<i>Finmag</i>	(I_2)	1.562	56.2
<i>Team</i>	(I_3)	0.804	80.4

Note: Workshops (*Wshps*); Mentorship Program (*Mentor*); B2B Connections (*B2B*); Business Processes (*Process*); Gender and Inclusion (*Genincl*); Leadership Team (*Team*); Gender and Inclusion (*Genincl*); Leadership Team (*Team*); Communications & Branding (*Brand*); Financial Management (*Finmag*); Bootcamps (*Bootp*); Gender of the founder (*Gendcl*); Duration of support (*Dursup*); Access to finance (*Afin*). Standard errors in parentheses. ***, **, *; significance levels at 1%, 5% and 10% respectively. Source: Authors.

In both specifications in Table 2, the duration of support (*Dursup*) is not significant. Since its coefficient is therefore taken to be zero, it can be explicitly stated that the duration of support

fundamentally determines whether a support structure has limited or robust financial health. If this coefficient were significant, the "duration of support (*dursup*)" variable could positively affect the probability that a given business support organization has limited versus robust financial health. Indeed, the relative odds ratio is equal to 1.019 and implies that the duration of support increases the probability that a support structure has a difficult (limited) financial health rather than a robust financial health by 1.9% as the duration of support increases. This result is confirmed by the descriptive statistics in the appendix, which show that structures whose duration of support for entrepreneurs is less than 3 months are less likely to have limited financial health than those whose duration of support is greater than 12 months. Indeed, nearly 16.22% of them are confronted with a limited financial situation when the duration of the support is less than 3 months, 18.92% when this duration is between 3 and 6 months, 29.73% when it is between 6 and 12 months and 35.14% when it is more than 12 months.

The estimated value of the weighting coefficient for the variable "gender of current manager (*Gendcl*)" is negative but not significant. The reasoning is practically the same as that stated for the "duration of support". If this coefficient were significant, this variable would have had a negative effect on the probability of having a rather robust limited financial health. We could thus interpret this coefficient as follows: the risk for a coaching organization to be in limited or fragile financial health rather than in robust or solid financial health is 6.7 times higher when it is led by a woman or a man than by a group of people. This result confirms the data that support structures led by a group of people are the least likely to be in poor financial health. The descriptive statistics confirm this result by establishing that only 2.7% of group-led structures face a limited financial situation compared to 35.14% of male-led structures and 62.16% of female-led structures. However, the coefficient of this variable is insignificant and therefore is considered "zero" in relation to the baseline situation.

However, the variables workshops (*Wshps*); mentorship program (*Mentor*); B2B connections (*B2B*); business processes (*Process*); gender and inclusion (*Genincl*); leadership team (*Team*); leadership team (*Team*); communications and branding (*Brand*); financial management (*Finmag*); bootcamps (*Bootp*); and access to finance (*Afin*) are all significant in the sense that they exert an

effect on the occurrence of an unfavorable rather than a favorable financial situation (see significance levels in Table 2).

The variable: "workshop (*Wshps*)" is positive and significant and the ratio of relative probabilities is equal to 1.229 (exp (0.207)). This implies that the fact that a support structure only organizes training for the benefit of entrepreneurs to the detriment of other services increases the probability of having a limited financial health by 22.9% rather than a robust financial health. The descriptive statistics confirm this result by indicating that of the support structures that have limited financial health, 5.41% rarely offer training to entrepreneurs and 56.76% regularly offer training to entrepreneurs.

The financial management variable is positive and significant at the 1% level. This implies that having limited financial planning increases the probability of having limited financial health rather than financial health and this increase would be 56.2%. The fact that a coaching organization has a communication strategy and a brand image also has a positive effect on its financial health. For a coaching organization located in the selected countries, limited branding and marketing, inconsistent or dispersed use of branding increases the probability of having limited financial Health by 22.9%.

Our results reflect the need for business support structures in Burkina-Faso, Cameroon, and Ghana to strengthen training programs for entrepreneurs in their support practices. This strategy is very useful for improving the productivity and competitiveness of businesses in the perspective that it promotes their access to finance, the market, and new technologies.

Moreover, the support structures that place particular emphasis on the training of entrepreneurs that they support not only contributes to the achievement of SDG4 (i.e., which aims to ensure access for all to quality education and to promote learning opportunities) but also ensures the longevity (sustainability) of their businesses. However, the training of entrepreneurs must therefore be adapted to the needs of entrepreneurs and those of the society in which they operate.

By strengthening the human capital of companies in the selected countries, the support structures contribute to the promotion of social entrepreneurship (i.e., by means of their various training

programs encouraging companies to fill a need in society that is still unfulfilled or partially satisfied). However, the training of entrepreneurs must be contained in a period not exceeding 12 months to guarantee the financial sustainability of the support structure which develops it. Indeed, although it is essential for the sustainable development of businesses and society, training involves many financial costs. These costs refer, *inter alia*, to the: fees of the trainers, social contributions of the training organizations, and supply of training equipment, as well as the loss of productivity of the personnel in training (Gosselin, 2006).

The originality of this paper lies in the fact that it analyzes the non-linearity between the training of entrepreneurs and the financial health of the support structures of the companies which offer such training contingent on the duration of the support, an aspect that has not yet been developed in the literature. Accordingly, most of the post-2015 studies emphasize the importance of education on human resources (Mariama, 2015), income inequality and poverty issues (Tang & Yang, 2021; Ajide & Alimi, 2021) and carbon emissions (Haini, 2021).

Most of these studies assume that the link between training or education and the variables retained (i.e., type of employees, duration of the contract, level of employees' studies, employee wages, the added value of companies, *inter alia*) is rather linear. This study shows that the attendant relationship could be non-linear when the duration of training exceeds the corresponding 12-month threshold for a company whose project idea was developed within a support structure, for the time it takes to transform this project idea into an operational and profitable business.

The authors who obtained similar results are not based on studies focusing on African countries. These include Eny and Regina (2021), who studies the behavior of education and health data in driving economic growth in Malaysia before the start of the COVID-19 pandemic. Conceptually, Ani and Reli (2018) articulate that the explanatory power of human capital is weak, while the hypothesis that the performance of economic and social development depends heavily on human capital is almost unanimously accepted.

According to Mariama (2015), a sustainable and democratic society depends on a majority of citizens who have received a minimum level of education which contributes to family well-being

and economic life. Wright (2021) shows that economic thought is dominated by strategic human capital and explores the impact of the concepts of free will, identity, community, and value on business decisions regarding investments in human capital. Following these authors, we establish the primacy of specific training over general training received outside the company, must not exceed 12 months to guarantee the financial health of the support structure for companies that provide training to the attendant entrepreneurs.

By integrating the time dimension into supporting entrepreneurs, this study also highlights the importance of specific and non-general continuous training for the productivity and competitiveness of businesses. We thus corroborate the thesis that there are conditions for making a profitable investment in training offered by business support structures. Our findings are broadly consistent with Ouattara (2009) since we have established that the primacy of specific training on general training received outside the company must not exceed 12 months to guarantee the financial health of the business support structure that offers such training to entrepreneurs.

5. Concluding Implications and Future Research Directions

To ensure sustainable growth, it is worthwhile to take into account the United Nations' SDGs. Within the premise of business support structures, a focus on SDGs enables improvements in business productivity and competitiveness. The objective of this paper is to analyze the relationship between the training of entrepreneurs, which is closely linked to SDG 4, and the financial health of support structures conditional on the duration of the underlying support. We estimate a multinomial logit model on data collected from business support structures in Burkina Faso, Cameroon, and Ghana.

Our results show that the financial health of a business support structure is not fundamentally dependent on the duration of support, but rather on other factors related to the quality of services offered to entrepreneurs. These include the organization of workshops (*Wshps*), mentoring programs (*Mentor*), B2B connections (*B2B*) and bootcamps (*Bootp*), but also the business processes (*Process*), the organization's gender and inclusion policy (*Genincl*), the skills of the management team (*Team*), the communication and branding strategy (*Brand*), the effectiveness and efficiency of financial management (*Finmag*), and their ease of access to finance from capital

providers (*Afin*). These variables are all significant in the sense that they exert an effect on the occurrence of an unfavorable rather than a favorable financial situation.

Due to financing problems faced by most companies and organizations in sub-Saharan Africa, including business support structures (Founanou & Ratsimalahelo, 2011), our results reinforce the idea that the time dimension is not a key factor explaining the financial situation of the support structures in the selected countries. This rather depends on the quality of the services offered to the entrepreneurs and on the technical quality of the structure. The challenge here is to allow the supported company to develop, to conquer new markets and to achieve economies of scale.

Our results imply that the training offer of support structures for entrepreneurs must be specific (and not general) to effectively contribute to the productivity and competitiveness of businesses (Romer, 1990; Lucas, 1988; Ajide & Alimi, 2021; Eny & Regina, 2021); which will undoubtedly help promote sustainable development in accordance with the United Nations' SDG4. Our results thus complement those obtained in the extant contemporary and non-contemporary literature (Becker, 1964; Barro & Sala-i-Martin, 1995; Acemoglu, 1997; Acemoglu & Pischke, 1999a; 1999b; Mariana, 2015; Tang & Yang, 2021; Ajide & Alimi, 2021) in the perspective that a company (support structure for companies in the case of cash) should invest in the training of entrepreneurs if and only if the expected benefits in terms of productivity gains in favor of the latter exceed the costs of training. The benefit sought here is the sustainable development of the society in which these companies operate.

In accordance with the results obtained, it is essential for various existing business support structures (i.e., business incubators, business incubators, business incubators, business accelerators, studio start-ups, manufacturing laboratories, *inter alia*) to adapt their training offers to entrepreneurs in accordance with the stage of development of the companies they support. This will allow these companies to acquire the skills they need to better take off and succeed in their growth, thanks in particular to the quality of the support they benefit from (i.e., logistical, facilitation of access to the market, to technology, financing, brand image, *inter alia*). Consistent with analysis by Ahmad and Thornberry (2018), business incubators are the support structures aimed at project leaders. An incubator and a start-up studio will consist of successfully moving from the stage of the project

leader to that of an entrepreneur in action. Once a business is established, the seasoned entrepreneur can join an incubator, accelerator, or business hotel to address corresponding needs.

Finally, complementary sites such as collaborative spaces (i.e., innovation spaces, coworking spaces, FabLabs, *inter alia*) are accessible to everyone at any point in the life cycle of a project or a company. Consequently, the support structure must be reassured that at any point in time, any training program it wishes to put in place to benefit entrepreneurs should correspond to a specific corporate need and must take place before or after the creation of the company. While workshops and training camps can be organized throughout the development of the business, acceleration programs should also be put in place after the business is established.

The results established in the study provide avenues for recommendations relevant to support structures for businesses, entrepreneurs, and public authorities. First of all, it is essential for support structures to strengthen the quality of training they offer to companies in accordance with the United Nations' SDG 4 (quality education). Accordingly, the attendant training must be specific to the company and therefore adapted to its level of development, which would enable it to grow sustainably. Consequently, companies in sub-Saharan Africa must integrate "staff training" into their development model. According to the new theories of endogenous growth, the contribution of the accumulation of human capital is essential for the productivity of firms and economic growth (Tang & Yang, 2021). To this end, in addition to implementing technical and specialized public structures for the promotion of entrepreneurship and the sustainability of businesses, public decision-makers must provide unwavering support to consolidate structures for private businesses, which remain faced with a multitude of problems, in particular, access to finance issues.

Confronted with the proliferation of actors in the field of business support that is apparent in sampled nations and, by extension, sub-Saharan African countries, it is essential for governments to strengthen the skills of actors involved in the management of support structures (i.e., academics, private sector, civil society) so that they are able to offer comprehensive and attractive services. The training programs must also be adapted to each category of support structures considering the challenges faced by the various companies supported.

One of the limits of this research is the absence of broader information on the number of training sessions that a business support structure should hold each year to guarantee productivity gains or the profitability of its investments in the training of entrepreneurs. A study that will take this dimension into account can provide more robust results. Likewise, the issue of specific continuous training and its impact on the ability of the supported companies themselves to cope with funding the problem could be considered as another future research direction.

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Appendices

Appendix 1: Definitions and Statistics of Explanatory Variables

Variables	Code and Definitions of variables (Response of questions in the survey)	Limited Financial Health		Strong Financial Health	
		<i>Freq</i>	<i>Percent</i>	<i>Freq</i>	<i>Percent</i>
Workshops (<i>Wshps</i>)	0 = No workshops offered.	2	5.41	0	0
	1 = Workshops rarely offered, led by non-experts, limited ability to meet contractor needs.	3	8.11	0	0
	2 = Workshops offered occasionally, inconsistent quality, mixed ability to meet contractor needs.	2	5.41	3	6.98
	3 = Workshops offered regularly, generally high quality, mostly meet contractor needs.	21	56.76	18	41.86
	4 = Workshops consistently offered, high and consistent quality of content and delivery, tailored to stage of business development, sector, and contractor capacity building needs.	9	24.32	22	51.16
Mentorship Program (<i>Mentor</i>)	0 = No mentoring program.	6	16.22	1	2.33
	1 = Rarely able to provide mentoring matches, limited pool of mentors to draw from, ad hoc mentoring connections.	4	10.81	2	4.65
	2 = Occasionally provides mentoring matches, uneven results in mentoring match success, rudimentary mentor/mentee training and integration.	7	18.92	6	13.95
	3 = Adequate ability to provide mentoring matches, good database of mentors, ad-hoc training and onboarding, some mentoring match success results.	6	16.22	18	41.86
	4 = Consistently able to provide high quality mentoring matches. Robust program with a large mentor database, systematic training and onboarding of mentors and mentees, strong history of productive mentoring engagements.	14	37.84	16	37.21
B2B Connections (<i>B2B</i>)	1 = Limited connections facilitated, very few partners identified.	5	13.51	4	9.3
	2 = Occasional connections facilitated but not covering the entire ecosystem (e.g., supply chain, production, market opportunities, complementary businesses, etc.).	16	43.24	10	23.26
	3 = Moderately regular connections are established across most of the ecosystem, with a regular record of agreements maintained and business gaps closed.	11	29.73	17	39.53
	4 = Frequent and highly developed connections in	5	13.51	12	27.91

Variables	Code and Definitions of variables (Response of questions in the survey)	Limited Financial Health		Strong Financial Health	
		<i>Freq</i>	<i>Percent</i>	<i>Freq</i>	<i>Percent</i>
	depth and breadth, significant number of business agreements that drive entrepreneurial development.				
Business Processes (<i>Process</i>)	0 = No support for business processes.	1	2.7	0	0
	1 = Limited business process support, informal and ad hoc, inadequate assessment of entrepreneurs' products, business plans and resources, support rarely adds value.	5	13.51	3	6.98
	2 = Generic knowledge of business processes (e.g., company registration), but limited for more complex businesses. Business plans are sometimes reviewed and product development gaps are sometimes filled.	8	21.62	4	9.3
	3 = Good knowledge of business processes in some industries. Adequate business process support services are provided. Some success in registration, product development, market entry, importing and exporting.	16	43.24	22	51.16
	4 = Strong knowledge of business processes for multiple industries and stages. Exceptional business process support, always readily available, that streamlines registration, product development, market entry and expansion potential.	7	18.92	14	32.56
Access to Finance (<i>Afin</i>)	0 = No support provided to promote entrepreneurs' access to funding.	4	10.81	4	9.3
	1 = Limited support to enhance access to finance, rarely provides opportunities to interact with funders/investors, minimal information on fundraising, minimal track record of entrepreneurs obtaining financing.	15	40.54	6	13.95
	2 = Somewhat adequate capacity to improve access to funding, general knowledge of available funding options, uneven track record of entrepreneurs obtaining funding.	5	13.51	22	51.16
	3 = Adequate capacity to improve access to financing, evidence of good connections and information about different types of financing, good track record of entrepreneurs obtaining financing.	8	21.62	11	25.58
	4 = Excellent track record of entrepreneurs accessing and securing diversified financing (e.g., angel networks, impact investors, venture capitalists, NGOs/INGs/multilateral grant-making organizations), entrepreneurs are still proactively exposed to opportunities.	5	13.51		
Gender and Inclusion (<i>Genincl</i>)	0 = No gender/inclusiveness programming.	8	21.62	3	6.98
	1 = Limited gender and inclusion programming, ideas or framework vaguely developed but not implemented.	3	8.11	4	9.3
	2 = Somewhat developed gender/inclusiveness	13	35.14	6	13.95

Variables	Code and Definitions of variables (Response of questions in the survey)	Limited Financial Health		Strong Financial Health	
		<i>Freq</i>	<i>Percent</i>	<i>Freq</i>	<i>Percent</i>
	programming, ad hoc training.				
	3 = Fully developed gender/inclusiveness program, progressive training program, shared knowledge products, good proportion of women in light programs.	9	24.32	17	39.53
	4 = Quality gender/inclusiveness programming, training program or partnerships focused on gender and inclusion, good proportion of traditionally underrepresented entrepreneurs in light and intensive programs.	4	10.81	13	30.23
Leadership Team (Team)	1 = The leadership team has limited skills and experience, with a low level of motivation to build or improve programs.	0	0	0	0
	2 = Leadership team has some business incubation or industry experience, but low skills and motivation to build or improve programs.	8	21.62	2	4.65
	3 = The leadership team has significant experience in business incubation and the sector, with a broad range of skills and a good track record of learning and commitment to improving programs.	19	51.35	17	39.53
	4 = The leadership team is highly qualified with extensive experience and relevant degrees, keeps abreast of incubation industry best practices, and has demonstrated a commitment to improving and building programs.	10	27.03	24	55.81
Communications & Branding (Brand)	0 = No branding or marketing materials.	1	2.7	1	2.33
	1 = Limited branding and marketing, inconsistent or scattered use of branding.	4	10.81	6	13.95
	2 = Relatively good branding, ad hoc marketing campaigns, no strategy.	14	37.84	23	53.49
	3 = Brand image quite adequate and consistent, clear marketing strategy.	12	32.43	13	30.23
	4 = Strong and consistent brand image, highly developed marketing strategy using multiple channels.	6	16.22		
Financial Management (Finmag)	0 = No Financial management system.	3	8.11	1	2.33
	1 = Limited financial planning, general budget developed, performance little or not tracked.	4	10.81	4	9.3
	2 = Some financial planning, ad-hoc updates, budget used operationally, performance monitored occasionally.	21	56.76	20	46.51
	3 = Strong financial plans, regularly updated, budget integrated into operations, performance tracked regularly.	9	24.32	18	41.86
	4 = Highly developed financial plans, continuously updated, budget fully integrated into operations, performance closely and regularly monitored, annual	3	8.11		

Variables	Code and Definitions of variables (Response of questions in the survey)	Limited Financial Health		Strong Financial Health	
		<i>Freq</i>	<i>Percent</i>	<i>Freq</i>	<i>Percent</i>
	audit.				
Bootcamps (<i>Bootp</i>)	0 = No Bootcamps offered.	7	18.92	9	20.93
	1 = Bootcamps rarely offered, delivered by non-experts, limited ability to meet contractor needs.	5	13.51	3	6.98
	2 = Bootcamps offered occasionally, inconsistent quality, mixed ability to meet contractor needs.	7	18.92	8	18.6
	3 = Bootcamps offered regularly, generally high quality, mostly meet contractor needs.	14	37.84	12	27.91
	4 = Bootcamps offered systematically, high and consistent quality of content and delivery, tailored to stage of business development, sector, entrepreneurial capacity building needs.	4	10.81	11	25.58
Gender of the Founder (<i>Gendcl</i>)	1= Male	13	35.14	7	16.28
	2=Woman	23	62.16	31	72.09
	3=Group	1	2.7	5	11.63
Duration of support (<i>Dursup</i>)	1= Less than 3 months	6	16.22	5	11.63
	2= Between 3 and 6 months	7	18.92	8	18.6
	3= Between 6 and 12 months	11	29.73	13	30.23
	4= More than 12 months	13	35.14	17	39.53

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