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Effectiveness of the Digital and Technological Entrepreneurship Ecosystem in Cameroon

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ABSTRACT

This study aims to investigate the factors associated with the effectiveness of the technological and digital entrepreneurship ecosystem (ECOTECH) in Cameroon. The methodology adopted consists of a range of semi-structured interviews in the ecosystem stakeholders. This was followed by a Pearson correlation analysis of a questionnaire submitted to 117 start-ups. The main results indicate that, the Cameroonian ECOTECH is a young and weakly effective environment. As far as start-ups are concerned, administrative difficulties, the distraction effect (increased involvement in activities not directly related to that of the start-up), and the lack of professionalism are closely linked to their ineffectiveness. Regarding the role of the state, start-ups value at 42.52% effective the efforts made by the government in improving the regulatory framework. The prevalence of the informal sector and the lack of infrastructure are among the reasons of this result. Regarding the role of incubators, although they have limited financial means to carry out their actions, start-ups rate their effectiveness at 63.5%. This result can be explained, among other things, by the interest for start-ups in the technical support and lobbying offered by incubators.

Keywords: Innovation, Entrepreneurship; Technology; Cameroon.

INTRODUCTION

ECOTECH [1] is the socio-economic environment made up of actors (Enterprise Support organisations, State, Business Angels, etc.) working for the development of agents (start-ups) and whose action contributes to improving the living conditions of populations. ECOTECH, when effective, has the potential to spur the development of an economy. Indeed, at the global level, it generates a total value of 3,000 billion dollars, a figure equivalent to the GDP of a G7 economy. Also, of the 10 largest companies in the world, 7 have been start-ups[2]. However, no African company appears on these rankings and not even Cameroon is left aside.

[1]Ecosystem of digital and technological entrepreneurship
[2]Statistics from Startup Genome (a research and policy advisory organization for public and private agencies committed to accelerating the success of their start-up ecosystem).

The technological innovation ecosystem in Cameroon is in its infancy. Like almost everywhere else in the world, it is made up of an interconnected set of actors, organisations, institutions and processes combined in various ways. (Isenberg, 2010; Mason & Brown, 2014). Thus, at the national level, we find both private and public incubators and accelerators; and, at the international level, pan-African networks. The latter, thanks to the support of private groups, academic institutions and international organisations, accompany and support young start-ups, which are the cornerstones of this ecosystem. However, although the results are encouraging thanks to a few "success stories", overall they remain limited. In addition, the global health crisis of COVID-19 has contributed to slowing its growth.

When compared to that of other African countries, Cameroon's ecosystem is not effective: it has difficulty achieving its goals (SER, 2019). As an example, Partech's annual report on the financing of African start-ups shows that, Cameroon occupied in 2020 the 14th position in the ranking out of 26 (Partech, 2020). Indeed, the country had only been able to raise USD 4 million: a relatively small amount on the African scale. When we know that Nigeria alone, the same year, was able to raise USD 307 Million. In addition, the country suffers from a lack of infrastructure. 3G and 4G coverage rates are quite low. As for the capacity per user, it is 2.7 kbit/s per user in Cameroon, against 5.9 in Côte d'Ivoire or 11.2 in sub-Saharan Africa. (ITU, 2018). The business environment is not to make things easy. Ranked 167th out of 190 in the Doing Business 2020 report, the business climate in Cameroon requires Cameroonian start-ups to face difficulties related mainly to taxation and access to financing.

This lack of performance can be credited to the relative youth of Cameroon's ECOTECH. If its premises are in the mid-2000s with the liberalization of internet access in the country (with the rise of cyber cafes), its origins can be traced back to the 90s. With the arrival of analogue television who opened the minds of Cameroonians to the world and to many of its innovations[3].

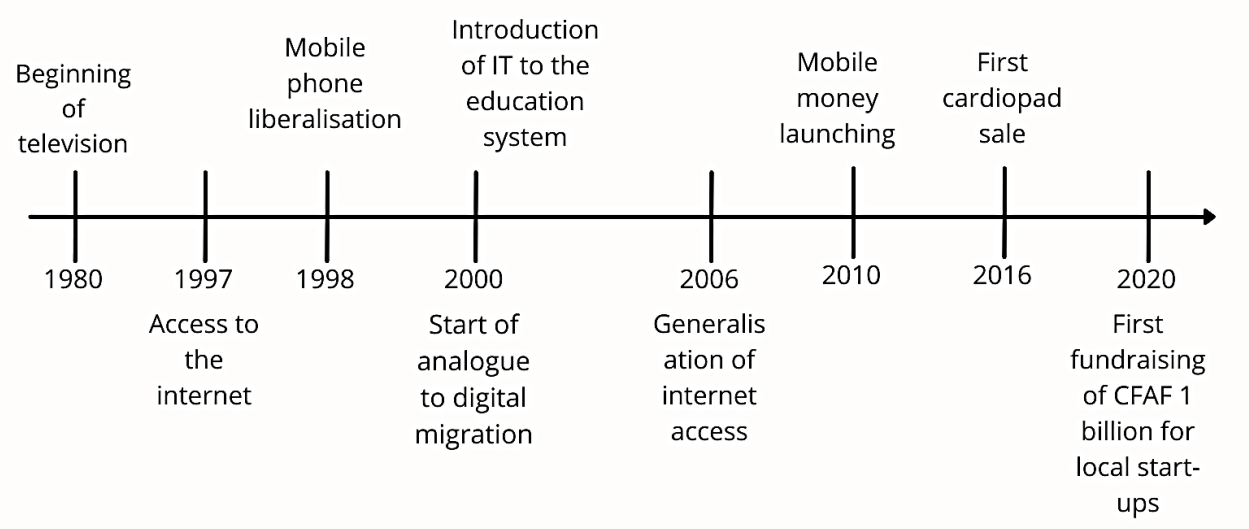


figure1: History of ECOTEC in Cameroon
Source: Authors, based on documentary research and structured interviews

[3]The role of the diaspora is also important. It helped bring the first technological innovations to the country. While the State implemented the infrastructures useful for the emergence of ECOTECH.

It was not until the early 2010s, with the widespread of smartphones and the launch of mobile money in the country, that ECOTECH began to experience considerable growth. The first start-ups support organisations (incubators) were established, and in 2016 one of the country's first technological innovations was invented: the cardiopad[4]. It only took a few years later for Cameroonian start-ups to raise their first billion of FCFA.

Although young and booming, ECOTECH is struggling to develop. This is partly due to the structure of the local economy and the global environment. The crisis following the fall in oil prices in 2016, the health crisis linked to COVID-19, mixed with the socio-political crisis succeeding the 2018 presidential elections and the security crisis raging in within the English-speaking regions (among the most dynamic regions of the country thanks to the "Silicon mountain") slow down the emergence of ECOTECH on one hand.

On the other hand, the very characteristics of Cameroonian start-ups affect the performance of the ecosystem. Throughout this study, the start-up will be considered within the meaning of Rispas et al. (2015). This is a young company with an innovative business model (and/or using innovative digital technologies) and which has the capacity to grow exponentially.

In Cameroon[5], the average start-up is 02 years old, is generally at the end of the prototyping phase (49,91%) and does not manage to cover all of its expenses through its income (65.81%), despite the fact that the COVID-19 brought it more opportunities than threats (69.74%). Although informed by the government's actions in its favour (53.8%), from which it does not benefit (87.2%), it considers the regulatory environment to be restrictive (52%). It is controlled (83.17%) by its founding members (03 members) and directed by one of them (97.4%), a man (85.5%) who generally has a university degree (89, 6%). It can be informal (51.3%) or legalised in the form of an LLC (44%), and its accounting consists of keeping a simple entry and exit register (44.4%). It does not have a professional email address (79, 65%) and works mainly in the tertiary sector. It is an SME which employs an average of 3 full-time and 04 part-time workers and is interested in software design and application development (80.3%). Thus, its main need in human resources is made up of developers (35%) and communication experts (30.8%). It has never benefited from bank credit and is mainly financed through its own funds (84.6%). If it obtains additional financing, its priorities will be to improve its product (43.6%) and to enter the market (29.1%). Indeed, it spends a lot in terms of internet and communication, work equipment and human resources. In addition, Its main difficulties are the management of daily activities, the rental of a work space and the availability of competent staff. The services It seeks the most from an incubator are lobbying (32.4%) and access to work space (25.7%). However, It does not have access to the services of the incubators (66.7%) although it considers their action effective (63.5%).

Thus, given the key role of the start-up within ECOTECH, in a specific way, the question raised by this study is : what are the factors linked to the success of start-ups in Cameroon?

[4]It is a touchscreen tablet with embedded applications for medical use. It was invented in Cameroon by a computer systems engineer.
[5]Information from the survey conducted throughout the study.

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LITERATURE REVIEW

The ecosystem of technological and digital entrepreneurship (ECOTECH)

The ecosystem concept finds its foundations in the science of ecology. The use of this concept in the technological environment became popular following Adner (2006). It provides the most widely used definition of technological innovation ecosystems[6]. Several attempts have been made to define the ecosystem of technological innovation. From all these attempts, one observes a blurred boundary between definitions and explicit descriptions. Gomes et al. (2018) point out that the technology ecosystem emphasises collaboration and value creation. Faced with the ambiguity of this concept, several definitions have been developed in the literature. Tsujimoto et al. (2018) stipulate for example that the technological ecosystem is the management of technology and innovation; in other words, it provides the products/services to a self-organised network made up of actors who have different attributes, decision-making principles and beliefs. Drawing inspiration from the literature and a dozen directive interviews conducted with start-ups and support structures in Cameroon, this analysis proposes the following definition: ECOTECH is the socio-economic environment made up of actors (Support structures, State, Business Angels, etc.) who work for the development of agents (start-ups) and whose action contributes to improving the living conditions of populations. The start-up being at the heart of this ecosystem, special attention is devoted to it.

Start-up definition

The concept of start-up is a term that was born in the United States. According to the Anglo-Saxon conception, a start-up is defined as a new company which is characterised by a strong growth potential, fundraising, an observation period before the launch of the product/service on the market, a small size of the business and an introduction to an innovative field. It is noted in the literature that this concept has had many definitions. The work of Krejci et al. (2015) indicate that a start-up is a new and temporary company that has a business model based on innovation and technology. To this understanding, Jdidi and Redouaby (2020) is added the ability for exponential growth. Other studies define this notion by focusing on their peculiarities which differ from large organisations, in particular promising ideas, organisational agility, willingness to take risks and aspiration for growth. (Weiblen & Chesbrough, 2015). A good summary can be found in Rispas et al. (2015). According to them, a start-up is a young company less than 10 years old, with an innovative business model (or technological innovation) and which demonstrates a significant growth in the number of employees or turnover. In the Cameroonian environment, studies have grasp the start-up as a newly created company with a strong potential for growth and success. (Mayegle & Ngah, 2014). Of all these definitions, it is important to note that there is a common point which lies in the fact that start-ups are young companies that evolve in the field of technological innovation.

The effectiveness and success factors of the Start-up

Start-ups are quite special businesses. They are characterised by a very high failure rate, mainly caused by the very unpredictable nature of their activities. (Jdidi & Redouaby, 2020; Elkington & Smallman, 2002). In addition, factors such as the complexity of the technologies, they use are also a source of risk of business failure (Aloini et al., (2012). Technology is not solely

[6]He views innovation ecosystems as a set of business collaborations in which individual offerings are combined into a cohesive solution for the customer. They are characterized by three basic types of risk: initiative risk, coordination risk with complementary innovators, and integration risk (the uncertainties presented by the adoption process across the value chain).

responsible for the failure of start-ups. Management is also an important element. Zwikael et al. (2014) explain, for example, that planning is essential to the success of projects. Start-up projects are not left aside. Indeed, a poor planning can make the day-to-day management of start-ups difficult. Good management is also noticed in accounting management. Good accounting management has the potential to improve a start-up's chances of success (Davila, 2005).

The effectiveness of start-ups is a very important topic in entrepreneurship research. This concept is of great importance as several studies find that nearly half of start-ups fail within their first four years of existence. This is how, for example, Suárez & Utterback (1995), Gitahy & Jose (2013) consider survival over time as a success factor. Effectiveness can therefore be synonymous with success. The success of start-ups has fuelled a great deal of work. Those of Sulayman et al., (2014) for example, say that, success is creating something that truly helps to improve people's lives. On the other hand, the work of Spiegel et al., (2015) emphasise the company's good financial performance as an indicator of success. Alongside sustainability, this indicator will be requested as part of this analysis.

METHODOLOGY

Strategy, theory and variables

The objective of this study is to identify the factors that influence the effectiveness of the ecosystem of technological innovation in Cameroon. Having previously considered the ecosystem as being the socio-economic environment made up of actors who work for the development of agents, this study will focus on the analysis of agents. Indeed, when the agents are effective, this leads ex ante to the effectiveness of the actors. Thus, the key effectiveness indicators will be linked to start-ups through their actions and interactions within the ecosystem.

Given that the start-up is an unstable organisation, the theory used here is that of contingency. Indeed, according to this theory, there is no suitable performance measurement system that can be applied to all organisations. (Tosi & Slocum, 1984). The authors who support this theory believe that the system should be adapted to the specificities of organisations as well as their context. (Wadongo & Abdel-Kader, 2014; Rejc, 2004; Plane, 2015).

Thus, in order to capture the effectiveness of the start-up, two main variables will be seeked. The first measures: the financial viability of the start-up: “SustaiStartup”. It is a variable that captures the financial stability of the company (Spiegel, et al., 2015). It is defined as the ability of the start-up to support the personal expenses of the founder or his team through the income from the sale of the main product or service. Descriptive statistics show that, these Cameroonian start-ups number 45, representing a percentage of 38.46%.

The second measures the life expectancy of start-ups. Given the high mortality rate of startups, longevity is very often associated with success (Keogh & Johnson, 2021). Indeed, the literature shows that the mortality rate of young startups (less than 5 years old) is estimated at nearly 90%. (Gitahy & José, 2013). The variable is called: “Sustainability”. It is associated with “SustaiStartup” in order to refine its relevance. It is therefore the cross variable composed of the number of years of existence and the ability of the startup to support the personal expenses of the founder or his staff. Descriptive statistics show that Cameroonian startups that manage

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to generate revenue from their main activity are on average 02.5 years old. However, given the diversity of their sources of income (love money, freelance, secondary activities and others) most of them manage to cover their expenses after 02.2 years of existence.

So, in the context of this analysis, an effective start-up is a start-up that has been around for a while and is able to sustain its loads.

The remaining variables are inspired by the performance indicator from the work of Vogel (2013). Indeed, the latter is interested in various sources of data classified according to whether they come from individuals, organisations or communities. This tool allows them to identify the strengths and unseal the weaknesses of the ecosystem according to six themes: people, financing, infrastructure, policies, regulation and demand. (Levie, et al., 2013). The table defining these variables is available in the appendices.

Analytical technique

Data analysis will be done through both statistical and descriptive data analysis and correlation analysis. This method was also used by Rompho (2018), as part of the performance measurement of 110 start-ups in Thailand. Indeed, the choice of the Pearson correlation coefficient lies in its effectiveness and its simplicity. This coefficient makes it possible to determine the strength of the relationship that exists between two variables, even if it does not specify the causal link. In order to measure its size and effect, the study will use Cohen's beacons (1988).

Table 1-1: The effect size of the correlation coefficient according to Cohen's beacons

Interval	Effect	Interpretation
Around 20%	Small size effect	Low correlation
Around 50%	Medium-sized effect	Average correlation
Around 80%	Large size effect	Strong correlation

Source: Author from Cohen (1988, p. 24)

As shown in the table above, the closer the coefficient is to 1 (in absolute value), the stronger is the relationship (Cohen, 1988; Rakotomalala, 2017).

The data source

The data comes from directive and semi-directive interviews conducted with project leaders in Cameroon. The start-ups come from 6 of the 10 regions of Cameroon (Centre, Littoral, North-West, West, South-West and Far North), plus those from the diaspora. The literature review, as well as the semi-directive interviews conducted with the ecosystem stakeholders (03 incubators or support structure, 01 banker, 01 public official, 06 start-ups) made it possible to provide a definition of the ecosystem, and to build a questionnaire for the investigation. Subsequently, the questionnaire was administered online via Google Form to 300 start-ups. However, 117 responses were received.

RESULTS, DISCUSSIONS AND RECOMMENDATIONS

General descriptive statistics

The first results of this study are presented below. These are descriptive statistics from the database compiled during the survey.

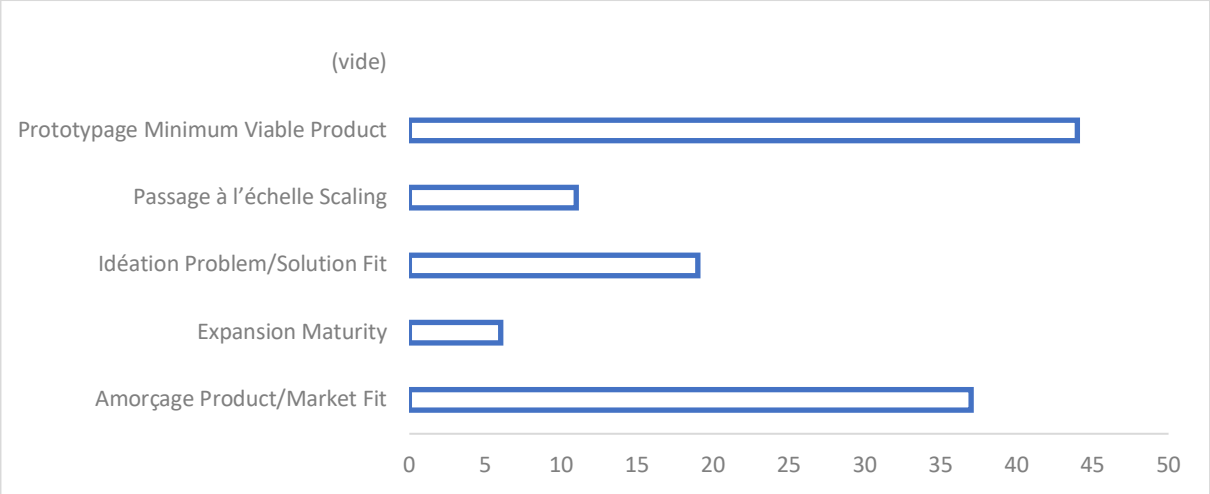


figure2: Distribution of the number of start-ups according to their level of development
Source: Authors

The figure above shows that, 44 start-ups, or 37.6% of the total number are still in the prototyping phase. This development stage is followed by that of initiation (31.6%), ideation (16.2%), scaling up (9.4%) and expansion (5.1%). Of all these young Cameroonian start-ups, 34.19% believe they can cover their expenses with their income. However, when these incomes come only from the main activity of the start-up, only 08.36% of start-ups believe that they can cover their expenses thanks to their income.

The main difficulties (apart from financial ones) encountered by start-ups are: day-to-day management of activities: 30.8%; workspace rental: 22.2%; lack of competent staff: 21.4%; administrative procedures: 12%; Internet access: 10.3% and tax procedures: 3.4%. Indeed, for several years, the Cameroonian public administration has been engaged in a process of dematerialisation of tax procedures (digital tax stamps, payment of taxes and duties online, etc.). However, although Law No. 2016/014 of December 14, 2016 simplifies the formalities for setting up businesses in Cameroon, the procedures are still cumbersome for some start-ups. However, the two biggest difficulties encountered by start-ups are day-to-day management (payment of salaries, invoices and other daily charges) and access to a workspace.

As far as expenses are concerned, the most important are those related to internet and communication costs. Indeed, on a scale from 1 to 10, start-ups rate their expenditures in terms of internet and communication at 5.28 on average; at 5.05 on average, their expenses in terms of work materials and tools; at 4.4 on average, their expenditure in terms of human resources; at 3.7 on average, their expenses in terms of logistics and transport; and, at 3.3 on average, their spending on office space.

The data show that there is a negative difference of about 3 percentage points between the turnover generated by the main activity (26.49% of the sources of income) and that generated by the other activities of the start-up (30% of sources of income). In this regard, 84.6% of Cameroonian start-ups use their own funds as a source of financing; in addition to equity, 38.5% say they use love money (funds from friends and family); Only 12.8% have already benefited from financing from external investors (Business Angels), while 21.4% have already benefited from prizes and subsidies.

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In the event of fundraising, start-ups relate that they are mainly used to carry out the following activities: Train staff (03.4%); Support daily expenses - salaries, bills and others - (05.1%); Finance the scaling up of their activity (17.9%); Finance a commercial campaign (29.1%) and improve their product (43.6%).

In order to capture the degree of professionalism of start-ups, the study looked at their use or not of a professional email address. Thus, statistics show that 20.35% of start-ups have a professional email address.

As for the impact of the health crisis, the COVID-19 pandemic positively affected 69.74% of start uppers by offering them new business opportunities. The main sectors concerned are: Education (23.1%); Service (20.5%); Health (16.2%); Trade (8.5%); Industry and engineering (7.7%) and finance (4.3%).

The statistics also provide information about the project leader and his team. For example, the level of technological education of project promoters is not low. Indeed, 63.2% of the interviewees have a good command of technological terms and tools.

Of the respondents, 14.5% are women. 89.6% have a university degree such as (technician's certificate, bachelor’s degree, engineer, masters, doctorate, etc.) as their last diploma; 5.2% have secondary education; 0.9% have a basic education level; and, 4.3% have no educational background. Only 42% of start-ups have acquired the skills they currently use in their start-up on their own. The latter also believe that the field related to their sector of activity is 78% consistent with their field of study.

Regarding their personal expenses, 53% of start uppers believe that they use their savings to cover them. 39.3% also consider doing freelance work to cover these personal expenses. 35% of them have another stable professional activity. 32.5% also live thanks to donations and help from their family and friends. Only 19.7% of them claim to finance their personal expenses with the income generated by the main activity of their start-up.

The motivation of start uppers is also taken into account. At 83.8%, the desire to provide solutions to people's problems is the main reason that motivates start uppers. Both come in second place (5.1%), the need to improve their standard of living and the need to create wealth for their country. Getting out of unemployment concerns only about 3% of the latter.

Effectiveness of Cameroonian start-ups

The main significant results of the Pearson correlations between durability, sustainability of start-ups and the other factors are presented in the following table.

Chart2: Pearson's correlations between longevity, sustainability of start-ups and other factors

Effectiveness Indicator		**Sustainability of the startup**			**Financial sustainability**
Variable code	***Correlated variable***	***Values***	***Effect size and significance***	***Sense***	***Values***
Devpstage	High stage of start-up development	0.4714*	Midsized	Positive	0.3161*
		0.0000	High significance		0.0005
MVP	MVP development level	-0.2414*	Small size	Negative	-0.1119
		0.0087	High significance		0.2298
ProfitYear	Aged and revenue-generating start-ups through core business	0.9633*	Big size	Positive	0.3577*
		0.0000	High significance		0.0938
Experience	Number of years of existence	0.8453*	Big size	Positive	0.3075*
		0.0000	High significance		0.0007
Legal	Formal startups	0.4016*	Midsized	Positive	0.2807*
		0.0000	High significance		0.0022
Sarl	Start-ups legalised as an LLC	0.2641*	Small size	Positive	0.2594*
		0.0040	High significance		0.0047
Transparency	High transparency of the accounting system	0.3589*	Midsized	Positive	0.3334*
		0.0001	High significance		0.0002
FounderSize	High founder team size	0.2273*	Small size	Positive	0.1346
		0.0155	Mean significance		0.1552
Fulltime Wor~r	High number of full-time staff	0.6021*	Big size	Positive	0.3412*
		0.0000	High significance		0.0002
ParttimeWo~r	High number of part-time staff	0.3078*	Midsized	Positive	0.2999*
		0.0007	High significance		0.0010
NManager	Project manager as the most in-demand skill	0.2925*	Small size	Positive	0.1619*
		0.0014	High significance		0.0811
MailPro	The start-up has a professional email address	0.4472*	Midsized	Positive	0.3547*

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		0.0000	High significance		0.0001
AcademicLevel	Founder's Last High Degree	0.2102*	Small size	Positive	0.1096
		0.0229	Mean significance		0.2396
AcademicSk~s	Usefulness of academic skills	0.1721*	Small size	Positive	0.0298
		0.0635	Low significance		0.7494
SustaiStar~p	Dependence on income from start-up activities	0.6209*	Big size	Positive	1.0000*
		0.0000	High significance		0.0000
PS_MainRev~u	Dependence on income from the start-up's core business	0.4106*	Midsized	Positive	0.7138*
		0.0000	High significance		0.0000
PS_2ndRevenue	Dependence on income from secondary activity	0.5081*	Midsized	Positive	0.7705*
		0.0000	High significance		0.0000
PS_Famous	Dependence on income from donations from family and friends	-0.1924*	Small size	Negative	-0.1534*
		0.0377	Mean significance		0.0986
TotalRevenues	Multiple sources of income	0.2065*	Small size	Positive	0.3600*
		0.0255	Mean significance		0.0001
Profitable	The start-up makes a profit	0.1565*	Small size	Positive	0.1709*
		0.0920	Low significance		0.0655
YearRenta~ed	The start-up is old and making a profit	0.9035*	Big size	Positive	0.4736*
		0.0000	High significance		0.0020
ProductUse	Number of use of the services and products of the start-ups	0.1952*	Small size	Positive	0.2268*
		0.0349	Low significance		0.0139
CAMainAct	Turnover from main activity	0.4515*	Midsized	Positive	0.4884*
		0.0000	High significance		0.0000
CASecAct	Turnover from secondary activity	0.3745*	Midsized	Positive	0.4696*
		0.0000	High significance		0.0000

DepOffice	Importance of office rental expenses	0.2904*	Small size	Positive	0.2751*
		0.0015	High significance		0.0027
DifAdmin	Importance of administrative difficulties (business creation)	-0.1976*	Small size	Negative	-0.1419
		0.0327	Mean significance		0.1269
Incubator	Have already benefited from the services of an incubator	0.1642*	Small size	Positive	0.0097
		0.0769	Low significance		0.9169
PrivateIncu~r	Have already benefited from the services of a private incubator	0.2077*	Small size	Positive	0.0425
		0.0246	Mean significance		0.6490
LogisticSu~t	Received incubator logistical support	0.1927*	Small size	Positive	0.0705
		0.0374	Mean significance		0.4499
FinancialS~t	Received financial support from an incubator	0.1534*	Small size	Positive	-0.0040
		0.0987	Low significance		0.9660

Source: Authors - Note: * significance at least 10%. Low significance: 10%; medium 5% and high: 1%.

The results of the correlations show that, three main factors have a negative effect on the sustainability of start-ups. These include dependence on income from donations from family and friends, administrative difficulties and the fact that the start-up is only at the MVP stage of development.[7]. The work of Jdidi and Redouaby (2020) show that start-up activity is highly risky. Therefore, the initial phase which consists of building the main product is decisive. Indeed, developing certain digital services requires funds, cutting-edge expertise, and a good command of technology. Elements that are still not accessible to young Cameroonian start-ups. Aloini et al. (2012)also explain that the lack of mastery of these technologies is a factor that encourages the failure of start-ups.

Although it is small, the results also show a negative correlation between the level of administrative difficulties and the sustainability of start-ups. On one hand, this can be explained by the legal environment. LaPorta et al. (2008) explain that countries with legal systems inspired by British common law offer more favourable environments for business development than those inspired by French civil law. The legal system in Cameroon with a French-speaking majority negatively affects the activity of start-ups. The descriptive statistics of this study also show that most of start-ups consider the regulatory framework to be restrictive. On the other hand, this result can be explained by the lack of information. For example, the Cameroonian

[7]Minimum viable product

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government has brought into force a law that offers to start-ups, tax exemptions for 5 years. Analyses show that 46.2% of start-ups are unaware of this. Moreover, when they are informed, only 12.8% benefit from it.

This raises another aspect: resources. It is recognised that the main need of start-ups and companies in general is financial. This lack of financial resources prevents start-ups from benefiting from the administrative support services of incubators. Indeed, there is a significant correlation between start-ups that benefit from exemptions and those that are in an incubator.

The origin of the financial resources of start-ups is of significant importance. The results show that, project promoters depending on financial aid from friends and families are not sustainable. However, start-ups that show a strong dependence on income from its activities show great sustainability. It is important to consider this: Okolouma (2018) believes that in Cameroon, the social protection introduced since the 1990s has only been marginal. In 2011, for example, only 7% of the Cameroonian population benefited from social security coverage. Mingled with the high unemployment rate (65%)[8], and low financial inclusion (14.68%)[9], these factors push start-uppers to find alternative sources of income in order to support their personal expenses and those of their young companies. This is income from donations, freelancers, professional activities separate from that of the start-up, prizes and grants, etc. Although they provide funding to the start-up, they may have the potential to reduce or distract attention and effort from the main business. The consequence of this distraction[10]also finds its justification in the size of the effects of full-time and part-time staff. Indeed, the size of the link between sustainability and the number of full-time employees is greater than that of the number of part-time employees. The distraction effect is only harmful when it is directed towards an activity that has no direct link with the activity of the start-up. The results also show that while dependence on donations is negatively associated with sustainability, dependence on income from secondary activities is positively associated with the sustainability of start-ups. At the global level, this phenomenon can be apprehended by what certain economists consider to be the after effects of development aid. (Chartier & Rivière, 2018; Freud, 2011).

Another interesting result of this analysis suggests that professionalism leads to the sustainability of start-ups. A result close to economic thought. Authors such as Popova (2006) explain for example that on the road to success, professionalism is necessary. However, he sees professionalism as having a formal job. In addition to this indicator of professionalism, this study asks for two others: transparency (the use of a formal accounting system) and organisation (the use of a professional e-mail address). The results support the theory (Davila, 2005). The relationships between the variables "legal", "transparency", "mailpro" and "Sustainability of the start-up" are all of high significance and medium size.

Effectiveness of government action

Start-ups rate the effectiveness of government-led efforts to improve the regulatory framework at 42.52%. The main action taken by the government is contained in the 2021 finance law. It offers during the incubation period (set at a maximum of 5 years), an exemption from all taxes,

[8]Data from the National Institute of Statistics.
[9]Domestic credit provided to the private sector (% of GDP). Data from the World Bank.
[10]The study defines the distraction effect as the increased involvement in activities indirectly related to that of the start-up in order to generate income.

duties and taxes with the exception of social security contributions to start-ups operating in the digital sector. Indeed, although 53.8% of start-ups claim to be informed of the existence of this exemption, only 12.8% benefit from it. One of the main explanations lies in the large size of the informal sector. Of the respondents, 51.3% are not legally registered. Moreover, there is a medium, negative and highly significant correlation between informal start-ups and their number of years of existence (-60.14%).

The significant correlations of Pearson with the variable "Exemption" (binary variable that captures whether or not the start-up benefits from tax exemptions) is presented below:

Chart3: Pearson's correlations between the use of tax exemptions and the other factors

Efficiency Indicator		**Use of tax exemption**		
Variable code	***Correlated variable***	***Values***	***Effect size and significance***	***Sense***
Legal	Formal startups	0.1889*	Small size	Positive
		0.0414	Mean significance	
FounderPower	High percentage of capital shares held by the founding team	- 0.2067*	Small size	Negative
		0.0327	Mean significance	
Fulltime Wor~r	High number of full-time staff	0.2094*	Small size	Positive
		0.0235	Mean significance	
ParttimeWo~r	High number of part-time staff	0.3691*	Midsized	Positive
		0.0000	High significance	
SocialNetworks	Use social networks in the production or distribution process of their product	0.1715*	Small size	Positive
		0.0645	Low significance	
CAMainAct	Turnover from main activity	0.1785*	Small size	Positive
		0.0542	Low significance	
DepOffice	Importance of office rental expenses	0.1680*	Small size	Positive
		0.0702	Low significance	
DepInterne~m	Importance of internet and communication expenses	0.2415*	Small size	Positive
		0.0087	High significance	
Incubator	Have already benefited from the services of an incubator	0.2169*	Small size	Positive
		0.0188	Mean significance	
PrivateIncu~r	Have already benefited from the services of a private incubator	0.2043*	Small size	Positive
		0.0271	Mean significance	

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PublicIncu~r	Have already benefited from the services of a public incubator	0.1718*	Small size	Positive
		0.0640	Low significance	
TechnicalS~t	Received incubator technical support	0.1573*	Small size	Positive
		0.0903	Low significance	
LogisticSu~t	Received incubator logistical support	0.1908*	Small size	Positive
		0.0394	Mean significance	
edtech	Have a good technological education	0.1863*	Small size	Positive
		0.0443	Mean significance	

Source: Authors - Note: * significance at least 10%; Low significance: 10%; medium 5% and high: 1%.

The table above shows that, the study found no significant link between start-ups benefiting from tax exemptions and sustainable start-ups. This can be explained by the lack of interest of start-ups for this measure[11]or better still, the young entry into force of this law. Indeed, the law offering tax exemptions is quite recent (01 years since its entry into force). This may partly explain the reason for its unrelatedness to the sustainability of start-ups.

On the other hand, the results show that, start-ups that benefit from exemptions are more often incubated in private incubators, have an activity that already generates income and face huge expenses in renting workspace and internet and communication costs.

Effectiveness of the action of incubators

In general, start-ups rate the effectiveness of support structures at 63.5%.

From the start-ups surveyed, 33.33% said they have already used the services of a business incubator, whether private or public. In average, they are 9 start-ups per incubator each year and have an average incubation period of 6.5 months. These start-ups benefit from services such as training, networking, provision of workspaces, in the proportions as presented below:

[11]The importance of Internet spending undoubtedly shows the need for infrastructure for startups. An area in which the government is struggling to provide effective solutions. For example, 3G and 4G coverage rates are quite low. As for the capacity per user, it is 2.7 kbit/s per user in Cameroon, against 5.9 in Côte d'Ivoire or 11.2 in sub-Saharan Africa. (ITU, 2018).

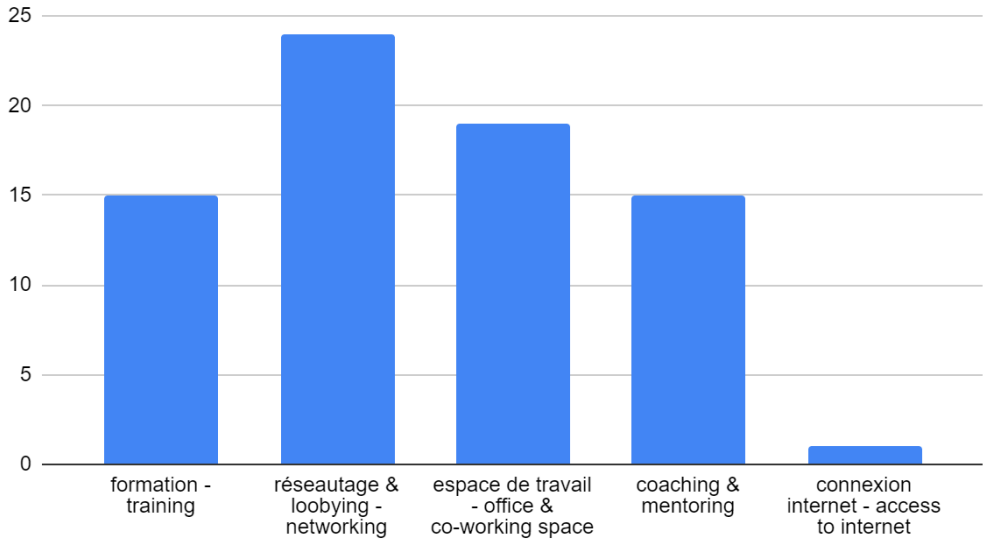


figure3: Breakdown of services offered by incubators to start-ups
Source: Authors

From the services provided by incubators, 10.8% of start-ups benefit from financial support, 21.7% of start-ups benefit from logistical support and 39.8% of start-ups benefit from technical support. In return, 5.3% of start-ups claim to remunerate incubators by offering them a percentage of their capital. On the other hand, 16% of start-ups offer various services in return, while 12% pay directly for the services provided by the incubators.

The significant correlations of Pearson with the variable "Incubator" (binary variable that captures whether or not the start-up benefits or has benefited from the services of an incubator) is presented below:

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Chart4: Pearson's Correlations Between Incubator-Affiliated Start-up Effectiveness and Other Factors

Indicator:			**Start-up affiliated with an incubator Sustainable start-ups affiliated with an incubator (a)**		
Correlated variable	**Effect size and significance**	**Sense**	**Correlated variable**	**Effect size and significance**	**Sense**
Level of development Priming	Small size Mean significance	Positive	Founder's Last High Degree	Small size (a) Small size Low significance (a) Low significance	Positive
Aged and revenue-generating startups through core activity	Small size (a) Large size Low significance (a) High significance	Positive	Usefulness of academic skills	Small size Low significance	Negative
Number of years of existence	Small size (a) Average size Mean significance (a) High significance	Positive	Dependence on income from prizes and subsidies	Midsized (a) Small size High significance (a) Mean significance	Positive
Sustainable startup	Small size (a) Large size Low significance (a) High significance	Positive	Multiple sources of income	Small size (a) Small size Mean significance (a) Low significance	Positive
Formal startups	Small size (a) Small size Low significance (a) Mean significance	Positive	The startup makes a profit	Small size Low significance	Negative
High transparency of the accounting system	Small size (a) Average size Low significance (a) High significance	Positive	Importance of difficulties related to daily management (salaries, invoices, etc.)	Small size Mean significance	Positive
Accounting as the most in-demand skill	Small size Mean significance	Positive	The startup benefits from tax exemptions	Small size (a) Small size Mean significance (a) Mean significance	Positive

Source: Authors - Note: Low significance: 10%; medium 5% and high: 1%.

The table above also presents the state of the correlations between the variable capturing the effectiveness of the action of the incubators and the other variables. This variable is nothing else than the cross-variable "Sustainable start-ups affiliated with an incubator (a)". The latter is the product of the "Incubator" and "Sustainability" variables. It therefore makes it possible to capture long-lasting start-ups affiliated with incubators. The main results show that start-ups that approach incubators have a strong dependence on income from prizes and subsidies and mainly face difficulties related to day-to-day management (payment of salaries, invoices and other charges). For sustainable start-ups affiliated with incubators, the results show a link between them and the fact that they benefit from tax exemptions, are formal and have a highly educated manager.

CONCLUSION

The aim of this study was to investigate on the factors associated with the effectiveness of the ecosystem of technological and digital entrepreneurship (ECOTECH) in Cameroon. The methodology adopted consisted of a series of semi-structured interviews with ecosystem stakeholders. Then, a questionnaire administered to 117 start-ups provided data that was analysed using Pearson correlations.

The study led to the following definition of ECOTEC: a socio-economic environment made up of actors (Support structures, State, Business Angels, etc.) working for the development of agents (start-ups) and whose action contributes to improving the living conditions of populations. Thus, the efficiency of the ecosystem has been closely linked to the development of start-ups.

Regarding the effectiveness of Cameroonian start-ups, three main lessons are found. First, administrative difficulties reduce the effectiveness of start-ups. This is mainly reflected and explained by the lack of interest of start-ups for the exemptions offered by the State, the prevalence of the informal sector among start-ups and the regulatory environment which is very unfavourable to the development of start-ups. Second, the distraction effect (increased involvement in activities not directly related to that of the start-up) reduces the effectiveness of start-ups. Indeed, the most efficient start-ups are those that have more full-time staff than part-time ones. The lack of financial security and financial stability pushes start uppers to seek external sources of income in order to cover their needs. The results showed, for example, that the dependence of start-ups on income from love money is negatively related to their sustainability. Third, professionalism is a hallmark of start-up effectiveness. Indeed, the more the start-ups are transparent in their accounting management, the more they use professional tools, the more they are sustainable.

With regard to the role of the State, the start-ups consider the efforts made by the latter to improve the regulatory framework to be 42.52% effective. Indeed, the main action taken by the government is contained in the 2021 finance law. It offers during the incubation period (set at a maximum of 5 years), an exemption from all taxes, duties and levies for the exception of social contributions to start-ups operating in the digital sector. Indeed, although 53.8% of start-ups claim to be informed of the existence of this exemption, only 12.8% benefit from it. One of the main explanations lies in the large size of the informal sector. Of the respondents, 51.3% are not legally registered. In addition, the study found no significant link between start-ups benefiting from tax exemptions and sustainable start-ups. This can be explained by the lack of interest of start-ups for this measure (interest turned towards infrastructure needs) or the

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young entry of the entry into force of this law. However, start-ups benefiting from exemptions are more often incubated in private incubators, have an activity that already generates income and face huge expenses in renting workspace, internet and communication costs.

Regarding the role of incubators, the main results showed that start-ups approaching incubators have a strong dependence on income from prizes and subsidies and mainly face difficulties related to day-to-day management (payment of salaries, invoices and others). As for long-lasting start-ups affiliated with incubators, the results show a link between them and the fact that they benefit from tax exemptions, that they are formal and are headed by a leader with a high degree. Indeed, start-ups rate the effectiveness of support structures at 63.5%. From the start-ups surveyed, 33.33% said they had already used the services of an incubator, whether private or public.

The main difficulty, of a financial nature, led to the following limits:

- The survey via questionnaire only focused on start-ups;
- The size of the sample which limits the robustness of some results;
- The geographical coverage of the country is reduced to 6 regions out of 10.

Next lines of research:

- Extend the analysis sample to other ECOTECH actors;
- Cover a larger target over a larger geographical area;
- Establish causal Relationship;
- Build an indicator adapted to the characteristics of ECOTECH.

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