Does Bricolage Ultimately Impact Firm Growth in Emerging Economies? A Quantitative Study in Egyptian

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الملخص
تتناول هذه الورقة البحثية العلاقة بين ريادة الأعمال ونمو الشركات باستخدام عينة عشوائية من ٣٠٠ شركة مصرية تعمل في مجال المعلومات والاتصالات والتكنولوجيا والتي تشمل شركات متنوعة لاختبار مدى تأثير الخصائص المختلفة للشركات على هذه العلاقة. تتوافق نتائج البحث مع نتائج البحوث في بلدان أخرى حيث يتبين وجود علاقة إيجابية بين المتغيرين وتعتبر هذه الورقة البحثية فريدة من نوعها إلى حد ما من حيث تركيزها على نمو الشركة بدلاً من الابتكار أو النتائج ذات الصلة بالميزة التنافسية، علاوة على أن الأبحاث الأخرى نادراً ما تركز على الأسواق الناشئة وبالأخص مصر. تساعد هذه المقالة في إبراز قيمة "البريكولاج" وأنواع الشركات التي يمكنها الاستفادة منه مما يسمح للأبحاث المستقبلية بالتوسع في الموضوعات المدروسة في الدول النامية و في مصر على وجه الخصوص.
الكلمات الرئيسية – بريكولاج؛ ريادة الأعمال؛ نمو الشركات؛ الاقتصادات الناشئة

Abstract
This research paper examines the relationship between entrepreneurial bricolage and firm growth using a sample of 300 Egyptian Information, Communication and Technology (ICT)

firms. These companies are diverse in their profiles to test the impact of different types of firms. Findings of the paper align with research findings in different countries showing a positive relationship between the two variables. This paper is fairly unique in terms of its focus on firm growth as opposed to innovation or competitive advantage related outcomes. Furthermore, research on the topic in emerging markets and in Egypt in particular is scarce. This paper helps showcase the value of bricolage and which types of firms would benefit from it. This allows future research to expand on the studied topics in emerging economies and especially in Egypt.

Keywords – Bricolage; entrepreneurship; firm growth; emerging economies

Paper type – Research paper

1. Introduction

Due to the evidence of entrepreneurship's ability to boost the performance of economies, it has been given a lot of attention by scholars in the business and management fields (Brenes et al., 2019; Heeks et al., 2021; Liedong et al., 2020; Rahman et al., 2022; van Dijk, 2018; Zhai & Su, 2019). Despite this overall effect of entrepreneurship and in particular small- and medium-sized enterprises (SMEs), at the level of individual businesses not all are successful. Some entrepreneurial ventures are destined to succeed and are thus, able to recruit more and more employees.

This eventually leads to filling unemployment gaps in the market, bringing foreign currency to the country through exports and generally reviving the economy. On the other hand, other entrepreneurial ventures fail to succeed or even survive which can lead to the opposite effect on the economy. Thus, it is very intriguing for researchers in the field to uncover the unique makeup of successful versus failing entrepreneurial businesses to ensure a more replicable model that can lead to the anticipated growth at the level of the economy at large (Anwar & Clauß, 2021; Sivathanu & Pillai, 2019; Tajeddini et al., 2023).

Many characteristics of businesses in terms of size, maturity levels, …etc. have been investigated by scholars to identify the most important in different contextual setups. This includes research on entrepreneurial orientation characteristics, bootstrapping, high growth ventures and many other topics around the world of entrepreneurship (Ato Sarsah et al., 2020; Mogos et al., 2015; Salimath & Jones 2011; Singh et al., 2022; Sivathanu & Pillai, 2019). One of the topics scholars are interested in and expect to lead to better performing businesses is entrepreneurial bricolage. This is especially the case for developing or emerging economies. However, despite the interest literature has put on the study of bricolage in emerging economies, the majority of work in the field is done in the context of developed countries (Fisher, 2012; Francisco, 2023;

Simba et al., 2020; Yu et al., 2018; Yu et al., 2019). The limited research that the authors found in emerging markets was mostly in the Far East with limited research in Africa and none in Egypt.

Thus, it is essential to test the applicability and potential entrepreneurial bricolage can offer in the Egyptian economy to be able to reap the benefits that theory expects it to offer. Therefore, our research intends to answer the following question:

R1: What is the effect of entrepreneurial bricolage on the growth of firms in an emerging economy, particularly the Egyptian ICT market?

The ICT field is vital to economies worldwide in today's technology driven markets. ICT can better equip a myriad of sectors ranging from agriculture to finance (Sivathanu & Pillai, 2019). Again, Egypt was chosen as a country of focus to respond to the need for more research within emerging economies to confirm the heightened importance of entrepreneurial bricolage within such economies and particularly since no previous research in the field was found to cover the Egyptian market.

This study covers a quantitative analysis of 300 ICT companies in Egypt. These companies range in their characteristics, meaning the sample includes companies of various sizes and maturity levels. The reason behind this is to assess the value of

entrepreneurial bricolage across such differing organizations. This paper intends to advance research on the field of entrepreneurial bricolage by testing it in a new untapped context, namely the Egyptian economy.

The structure of the remainder of this paper investigates, firstly, the literature on entrepreneurial bricolage and firm growth. Secondly, the theoretical model and identified hypotheses are highlighted. Thirdly, the methodology that was followed in this research is presented. This is followed by a discussion of the findings of this research. Finally, the research implications and recommended future research avenues are outlined.

2. Literature Review

2.1. Firm Growth

If entrepreneurial businesses do not grow, there is limited, if any, value that they can offer to any of the parties involved. Unless an idea is commercially viable over time, the owners will not continue to make profits, employees will not continue to be employed and economies will not be able to benefit from the business (Braunerhjelm & Thulin, 2022; Hafiz et al., 2021; Monteiro, 2019; Saha et al., 2022; Vaz, 2021). A lot of recent research focuses on shorter term implications such as innovation, competitive advantage, new venture startup, …etc. Though this is

founded on the fact that previous research has established a link between such goals and economic development or venture growth, growth remains the ultimate end goal or test of such success and should always be the focus (Braunerhjelm & Thulin, 2022; Chan & Mustafa, 2020; Hafiz et al., 2021; Monteiro, 2019; Saha et al., 2022; Vaz, 2021; Zhai & Su, 2019).

Firm growth can be measured using various forms. The three most used definitions revolve around a) number of employees, b) financial performance (in terms of revenue or profit) and c) market share. These can either be assessed as absolute figures, relative growth or a combination of the two. In this paper we only rely on relative growth figures as companies are more willing to share their percentage growth rather than their actual figures especially when it comes to financial performance. Additionally, due to the lack of concrete market information in the Egyptian setup, we did not include market share questions but instead gathered information of the company's opinion on its relative growth compared to the market.

To ensure the research is not biased towards a certain type of firm, the sample includes firms of different sizes and maturity levels (Albertini & Muzzi, 2016; Junaid et al., 2022; Reypens et al., 2021). Companies that exited or are about to exit the market (i.e. at the decline stage), however, were not included as they were not found. The coverage of different firms of all other

stages is interesting in showcasing the impact of entrepreneurial bricolage for firms at various stages and how this might differ (Yu et al., 2019; Yu & Wang, 2021).

2.2. Entrepreneurial Bricolage

Entrepreneurial bricolage has been considered a distinct theory by some scholars (Davidsson et al., 2017; Senyard et al., 2011). Other researchers consider entrepreneurial bricolage a strategy utilized by firms to form a competitive advantage. These scholars consider bricolage as a strategy under the resource-based theory (Singh et al., 2022; Sivathanu & Pillai, 2019; Steffens et al., 2010; Yu et al., 2018; Zhang et al., 2021). In their pivotal definition of bricolage, Baker and Nelson (2005, p. 333) describe it as “making do by applying combinations of the resources at hand to new problems and opportunities".

The majority of work in the field of entrepreneurial bricolage shows its positive benefits on firm innovation and competitive advantage (Bhardwaj et al., 2023; Ciambotti et al., 2022; Magobe et al., 2024; Martínez et al., 2023; Reypens et al., 2021; Sivathanu & Pillai, 2019; Steffens et al., 2022; Tajeddini et al., 2023; Yu & Wang, 2021). The relationship between entrepreneurial bricolage and firm growth is not always positive, though. Some scholars debate that entrepreneurial bricolage, especially when overutilized, can lead to low-quality results that

harm the firm more than benefit it (Bojica et al., 2015; Chang & Chen, 2020; Klein et al., 2023; Namatovu, 2018; Reypens et al., 2021; Shepherd et al., 2017; Steffens et al., 2022).

The result of entrepreneurial bricolage, however, might depend on the type or intensity of its usage. Baker and Nelson (2005), in their highly referenced study in the field, distinguish between parallel and selective bricolage. This is the most widely used taxonomy for bricolage. Parallel bricolage is when firms often use bricolage and in multiple areas of the firm. This type of bricolage is found to have negative effects on the firm. On the other hand, selective bricolage, is basically using it where it matters and therefore, leads to positive outcomes (Baker & Nelson, 2005; Bojica et al., 2015; Mateus & Sarkar, 2024; Namatovu, 2018; Reypens et al., 2021; Shepherd et al., 2017; Steffens et al., 2022; Steffens et al., 2010; Zhang et al., 2021)..

3. Hypotheses Development & Theoretical Model

As presented in the literature review above, the study of entrepreneurial bricolage and firm growth and the relation between the two is crucial. This is especially the case in an emerging economy such as Egypt where entrepreneurial bricolage is rarely tackled despite the potential it can offer. There are other studies that tackled emerging economies such as Sivathanu and Pillai (2019) analysis of technology startups in

India. Here, entrepreneurial bricolage was tested as a mediator between technology and entrepreneurial orientation on the one hand, and sustainable performance on the other. Results show a strong mediating effect of bricolage on this relationship. Additionally, Reypens et al. (2021) studied medical startups in Uganda using qualitative means of research. Their study leads to a distinction between Optimizers and Movers/Shakers. The former are good at optimizing their bricolage usage and are thus, able to advance their technology through it. The latter use bricolage as a response to environmental pressures and cannot reach the same results of Optimizers. In the Middle East region, Bojica et al. (2015) analyzed 160 women-led ventures operating in Palestine. Their findings show that bricolage only benefits firms entering new markets with their existing products or services. When, however, firms try to utilize bricolage to offer new products or services, this is not beneficial.

A lot of research in the field of entrepreneurial bricolage focuses on newly established firms. Senyard et al. (2009) conclude that bricolage only benefits the firms at early stages and even becomes damaging when used by firms at later stages. Senyard et al. (2010) studied 561 Australian startups concluding a positive correlation between bricolage and the performance of the firms. This is especially the case for sales performance. Similarly, Senyard et al. (2015) examined 529 nascent firms (preoperational

and up to four years in operation) to discover that bricolage is associated with better sales performance and persistence while it is not related to faster organizational growth. Steffens et al. (2022) differentiate between the impact of bricolage based on two factors, namely a) the firm's stage of operation and b) the firm's intention to grow. When a firm is new, bricolage has a positive impact on performance no matter what the firm's intentions are. However, older firms are only able to reap the benefits of bricolage when they have strong intentions to grow.

The study of entrepreneurial bricolage particularly in the Egyptian market can offer a lot. Egyptians are thought to be creative in utilizing their existing resources which makes the study of bricolage an interesting endeavor. Thus, this study focuses on one hypothesis as a starting point to the analysis of entrepreneurial bricolage within the Egyptian context, namely:

H1. Entrepreneurial bricolage has a positive impact on firm growth.

Accordingly, the theoretical model presented in ***Figure 1*** below is followed in this research.

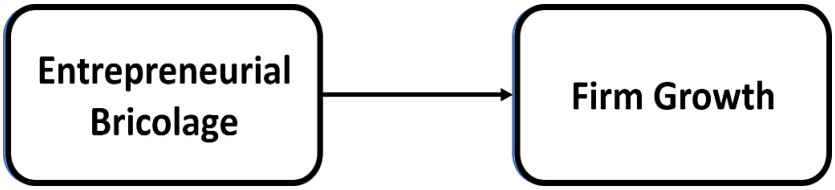

Figure 1 - Theoretical Model

Source: Authors' own work

4. Methodology

4.1. Research Context

Despite literature's emphasis on the applicability and importance of bricolage within emerging economies, limited research in the field has been done outside of the context of developed economies (Fisher, 2012; Francisco, 2023; Simba et al., 2020; Yu et al., 2018; Yu et al., 2019). This research focuses on the Information, Communication and Technology (ICT) sector due to its importance for the Egyptian Gross Domestic Product (GDP), representing 5% of GDP (US International Trade Administration, 2022). Moreover, ICT is generally a dynamic and innovative field that is currently highly demanded by most industries.

4.2. Population, Sample and Data Collection

There are around 2000 ICT firms registered in Information Technology Industry Development Agency (ITIDA), which is part of the Ministry of Communications and Information Technology in Egypt. Most of these firms are located in Cairo and they vary in size and services or products offered (ITIDA, 2023). This research paper utilized ITIDA's database, using a random sample of 323 companies at a confidence level of 95% (Saunders et al., 2009). The research's unit of analysis was entrepreneurs and managers at the firms.

After editing the survey based on an initial pilot of 36 respondents, data was collected from the targeted 323 respondents. Due to missing data, 23 responses were discarded which led to a final sample size of 300. This means 7% of responses were discarded which meets research standards (Saunders et al., 2009).

Table I shows the characteristics of the sample in terms of number of years of operation, firm size (viewed in terms of revenue and number of employees), firm maturity and the respondent's title.

5. Table I - Demographic Characteristics of the Sample

Demographic	Characteristics	Frequency	Percent
Years in business	Less than 5 years ago	61	19%
	5 to less than 15 years ago	94	30%
	15 to less than 25 years ago	86	27%
	25 or more years ago	74	23%
Company Size (based on number of employees	*Micro:* less than 10 employees	67	21%
	Small: between 10 and 49 employees	94	30%
	Medium: between 50 and 200 employees	81	26%
	Large: more than 200 employees	73	23%
Company Size (based on revenue)	*Micro:* annual sales less than EGP 1 Mn	67	21%
	Small: annual sales between EGP 1 Mn & 50 Mn	97	31%
	Medium: annual sales between higher than EGP 50 Mn & up to 200 Mn	76	24%
	Large: annual sales higher than 200 Mn	75	24%
Company Maturity (Firm Lifecycle)	*Startup*: starts with the launch of the business and ends when it reaches breakeven	62	20%
	Early growth: starts with breakeven and ends with the establishment of a sustainable business	76	24%
	Expansion/ sustained growth: marked by healthy profits and a clear indication of growth potential	93	30%
	Maturity: marked by a successful position in the market while growth slows and competitive pressures grow	81	26%
Respondent Title	Manager/Team leader	77	24%
	Department head/ Section chief	62	20%
	Executive/ Director	72	23%
	Owner/Partner	104	33%

5.1. Constructs Measurement

A. Firm Growth

As discussed in the literature review section, firm growth is usually measured by one or more of the following: a) sales, b) employment and c) market share. The relative growth in sales and employment are more often used as they are less subjective than market share. Additionally, together they cover both short-term as well as long-term performance (Yu et al., 2019; Yu &

Wang, 2021; Zhou & de Wit, 2009). Thus, in this research paper, relative growth of firms was assessed in terms of a) sales, b) number of employees and c) growth rate as compared to that of competitors.

B. Entrepreneurial Bricolage

The research instruments used by Davidsson et al. (2017); Steffens et al. (2022) were utilized here to ensure validity and reliability of the measures and to test their applicability in the Egyptian market. These are outlined in ***Table II*** below.

Table II – Entrepreneurial Bricolage Construct

Item/Measure	**Factor Analysis**
To deal with new challenges we access resources at low or no cost and combine them with what we already have	X
We typically take on a broader range of challenges than others with our resources would do	X
When dealing with new problems or opportunities we immediately take action by assuming that we will find a workable solution	0.926
By combining our existing resources, we take on a very broad variety of new challenges	0.928
Our scarce resources are used creatively to our advantage	0.919
We usually find workable solutions to new challenges by using our existing resources	0.910

5. Results

5.1. Reliability and Validity Analysis

As shown in ***Table II*** above, the first two questions were removed due to their low factor loading score. The rest of the validity analysis using rotated factor loading are also presented in ***Table II*** showing very good scores (Hair et al., 2019). Additionally, ***Table III*** shows the reliability of the remaining constructs calculated using Cronbach α exceeds the 0.7 threshold. Similarly, the Average Variance Extracted (AVE) exceeds the required 0.5 requirement and the Composite Reliability (CR) is above 0.7. Thus, the constructs are valid and reliable (Hair et al., 2019; Saunders et al., 2009).

Interestingly, respondents have a significant negative view of entrepreneurial bricolage (mean = 2.273 and p-value = 0.000). On the other hand, respondents have a significant positive view of firm growth (mean = 3.223 and p-value = 0.000). As presented in ***Table IV*** there is a slight lack of discriminant validity between the two constructs (Hair et al., 2019). Therefore, future researchers should further test and analyze this to ensure a higher level of discriminant validity.

Table III - Reliability & Validity Measures

Construct	Reliability coefficient	Composite Reliability	Average Variance Extracted	Explained variance	Sample Mean	Standard error	Confidence Interval (95%)		P-Value
							Lower	Upper	
Bricolage	**97.20%**	**95.84%**	**85.20%**	**92.252%**	**2.273**	**0.413**	**2.220**	**2.303**	**0.000***
Firm Growth	**73.20%**	**81.43%**	**59.46%**	**67.449%**	**3.223**	**0.659**	**2.873**	**3.467**	**0.000***

Table IV - Discriminant Validity

Construct	Firm Growth
Bricolage	0.77

5.2. Effect of Organization Characteristics on Results

Table V shows that there are three control variables that significantly affect the relationship between entrepreneurial bricolage and firm growth. These are a) the number of years the company has been operational (p=0.008); b) the size of the firm as per its revenue (p=0.001); and c) the maturity level of the firm (p=0.025).

First, in terms of the firms age, bricolage helps bigger firms (medium- and large-sized) grow more. Second, in terms of the number of years of operation, firms that have been operating for 5 to 25 years have less of an advantage than younger as well as older firms. Third, in terms of the firm's maturity, early growth firms do not grow when using bricolage and mature firms

slightly grow. On the other hand, startups as well as firms at an expansion stage find bricolage useful in their growth.

Table V - Effect of Organizational Characteristics & Independent Variables on Firm Growth

Tests of Between-Subjects Effects

Dependent Variable: Firm Growth

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	240.047	43	5.582	9.560	.000*
Intercept	4.527	1	4.527	7.752	.006*
BR_AV	33.391	3	11.130	19.061	.000*
YrEstab	4.680	1	4.680	8.015	.005*
Size_Rev	2.560	1	2.560	4.385	.037*
BR_AV * YrEstab	8.313	4	2.078	3.559	.008*
BR_AV * Size_Rev	11.407	4	2.852	4.884	.001*
BR_AV * Maturity	6.629	4	1.657	2.838	.025*
Error	149.485	256	.584		
Total	3506.593	300			

** Indicates significant effect at a 5% level*
R-squared = 0.616

5.3. Structure-Equation Modeling (SEM)

The constructs tested for validity and reliability were modelled using Lisrel 8.80. The results of this structured equation model in terms of model goodness of fit is presented in ***Table VI*** with all

figures showing an adequate or good fit model (Ato Sarsah et al., 2020; Dewhurst, 2006; Hair et al., 2019; Saha et al., 2022).

Table VI - Goodness of Fit Indices

Indicator	Value
Chi Square	**154.22**
df	**13**
RMSEA	**0.191**
RMR	**0.027**
GFI	**87%**
AGFI	**72%**
R-square	**0.65**

The path analysis of the model is depicted in ***Figure 2*** as well as ***Table VII***. Additionally, the correlation between the independent and dependent variables is presented ***Table VIII***. These show a strong significant and positive relationship between entrepreneurial bricolage and firm growth.

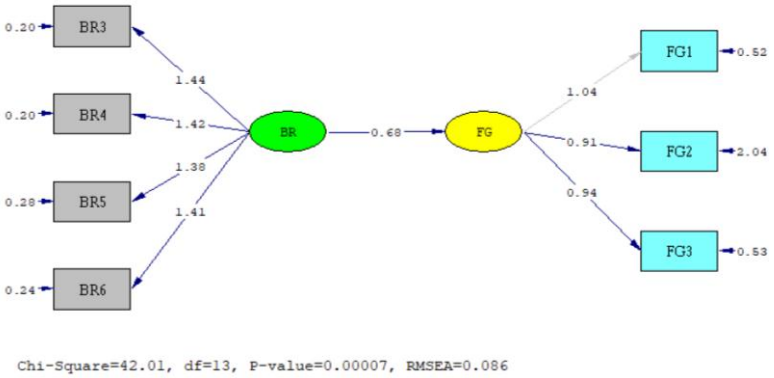

Figure 2 - Path Diagram

Source: Authors' own work

Table VII - Path Analysis

Hypothesis	Effect	Path Coefficient	Standard Error	t-Value	P-Value
H1a	Bricolage -> Firm Growth	0.68	(0.06)	10.78	0.000*

** Indicates significant effect at a 5% level*

Table VIII - Correlation Structure Between Research Constructs

	Firm Growth	Bricolage
Firm Growth	1.00	
Bricolage	0.68	1.00
P-Value	0.00	

6. Discussion and Implications

The most important take away of this research paper is that entrepreneurial bricolage does impact firm growth in the Egyptian ICT market. This contextualization is crucial as a first step towards more analysis and research in the field of entrepreneurial bricolage in emerging markets, in the Middle East and in Egypt in particular.

Moreover, the type of demographic characteristics that affect the relationship between entrepreneurial bricolage and firm growth is interesting. Literature has assumed and in some cases even proved that startups benefit a lot of entrepreneurial bricolage. Senyard et al. (2009; 2010; 2015) focus on startups and how bricolage is advantageous for them and harmful for organizations later on in their maturity. Many other researchers have only included startups in their research such as Sivathanu and Pillai (2019) researching tech startups in India, Reypens et al. (2021) studying medical startups in Uganda and Bojica et al. (2015) focusing on women-led startups in Palestine. This current research paper did confirm that startups benefit a lot from entrepreneurial bricolage (mean = 3.225). However, it is noteworthy that firms at the expansion or sustained growth stage benefit even more from entrepreneurial bricolage (mean = 3.453).

In terms of the number of years of operation, Steffens et al. (2022) conclude that new firms have better performance using entrepreneurial bricolage regardless of their growth plans or desires. Again, this research confirmed this for firms that have been in operation for less than 5 years (mean = 3.298). Interestingly, however, firms that have been operating for 25 years or more grow even more when utilizing bricolage (mean = 3.309).

Finally, in terms of the size of the firm, a lot of research focused on the impact of entrepreneurial bricolage on SMEs due to the general consensus on bricolage being useful for this group. Researchers who focused on SMEs include Anwar and Clauß (2021) who studied family-owned SMEs in Pakistan, Baier-Fuentes et al. (2023) who researched owner-led SMEs in Chile, Tajeddini et al. (2023) with their analysis of tourism and hospitality SMEs in Japan and Tsilika et al. (2020) who focused on Greek SMEs. This research paper, however, found different results for the market under study. The highest firm growth was evidenced for large firms (mean = 3.366), followed by medium-sized firms (mean = 3.352). The lowest firm growth was actually for small firms (mean = 3.093) and micro firms were slightly better of (mean = 3.113).

7. Conclusion

This research paper investigated the impact of entrepreneurial bricolage on firm growth. The ICT market in Egypt was studied covering a wide array of company profiles. Findings show a significant positive relationship between entrepreneurial bricolage and firm growth. This relationship is affected by three firm characteristics, namely a) years of operation; b) firm size (as tested by the firm's revenue); and c) the maturity stage of the firm. Results were in line with existing research in terms of startups or firms that have been operational for less than 5 years benefiting from entrepreneurial bricolage. The study, however, shed the light on the potential bricolage has to offer to older or more mature firms. Finally, in terms of the size of the firm, the research findings were different from existing literature in that it found medium and large firms to benefit more from bricolage that smaller firms.

This research is fairly unique in its focus on the Egyptian market that has a lot to offer to the study of bricolage and in turn, a lot to learn from its application. Future researchers are encouraged to test bricolage a) in other Middle Eastern and emerging markets; b) in different sectors within Egypt; and c) in different regions within Egypt as this study only focused on Cairo. This will enhance the generalizability of this research.

A study of the different types of bricolage is vital in reaching a more nuanced taxonomy within the field. Additionally, relating bricolage to different control variables such as organizational and entrepreneurial characteristics will be very interesting. Another important factor is testing the mediating or moderating effects of other relevant variables. Finally, further understanding of how bricolage is utilized by firms is crucial.

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