

## **DETERMINANTS OF THE GROWTH OF STONE BUSINESS: A STUDY ON SYLHET DISTRICT OF BANGLADESH**

**Saief Uddin Ahmed<sup>1</sup>, Mehadi Amin Miah<sup>2</sup>**

<sup>1</sup>Faculty, Department of Business Administration

Sylhet International University, Sylhet-3100, Bangladesh

<sup>2</sup>Bangladesh University of Professionals, Mirpur Cantonment, Dhaka, Bangladesh

<sup>1</sup>ahmedsaief@gmail.com, <sup>2</sup>mehadi075@gmail.com

### **Abstract**

Survival and growth of any business are highly reliant on the understanding of how business environmental factors work together with the operational skills of entrepreneurs. With the view in mind the authors tried an attempt to identify the determinants of stone business growth in Bangladesh especially in the stone business thriving region like Sylhet. This paper revealed 61 percent variation in the growth of stone business along with a fitted model of investment growth of stone business =  $5.231 + 0.636$  (duration of business) +  $0.221$  (types of stone business) –  $0.167$  (technological factors) +  $0.183$  (communication factors) +  $0.139$  (sources of startup capital). In this study, ninety-nine entrepreneurs of seven important locations, from the two Upazila of Sylhet district, were surveyed using systematic random sampling technique. Data from questionnaire were analyzed using SPSS. The techniques employed in examining the data included descriptive statistics, reliability analysis and regression analysis.

**Key words:** Stone business, Growth, Sylhet, Bangladesh

## Introduction

Advanced constructions might not have foreseen without the presence of stone. Actually in the aged era, huge and hard rocks were the establishment for Pyramids and Tajmahal. Stone crushing business is an fundamental modern division to any country associated in producing crushed stone for diverse sizes depending upon the prerequisite which acts as raw material for various development activities for example, development of roads, highways, bridges, buildings, canals and a number different structural plans. Central pollution control board in 2009 reported that stone crushers are basically small scale industries mostly owned and maintained by less educated persons and are numerous zones in the country.

The stone quarries located in Sylhet District have been active since the end of the Second World War, in the late 1940s. Back in the early days, most of the stone was collected by using local river-rafts made of three timber planks, known as 'burkis'. The Bholagonj stone quarry took off between 1964 and 1969, when the Bholagonj ropeway conveyor - a type of gondola lift that carries goods rather than passengers - was constructed to advance the development of the East-Pakistan Railway (Manzoor, 2007). Quarries are generally used for extracting building materials, such as dimension stone, construction aggregate, riprap, sand and gravel. The word quarry can include underground quarrying for stone, such as Chief, Single, Botu and stone (Chowdhury, Khan, & Islam, 2014). There are seven major stone quarries in Sylhet. These are Bholaganj, Uthma stone quarry at Companiganj Upazila, Jaflong and

Bisnakandi stone quarries at Goainghat Upazila, Lalakhal and Shreepur quarries at Jaintiapur Upazila in Sylhet and Chhatak stone quarry in Sunamganj. Bholaganj is the biggest stone quarry in the country. Bholagonj stone quarry is located about two km from Companyganj and twenty km from Sylhet Sadar. It stands on the bank of the river Dhaolai that separates Bangladesh from India. Bisnakandi stone quarry at Goainghat Upazila, one of the biggest quarries, supplies stones worth thousand crore (1 crore = 10 million) of Taka annually, to different parts of the country.

There are two types of quarrying: A group of labors takes out only sand and clay and dredges at the quarry. They get Tk. 250 to 300 per 12-hour shift. The other group extracts stones from the quarry holes but their payment depends on the amount of stones extracted. They get Tk. 5,000 per truck of 1,000 cubic feet. There are also laborers ferrying stones on boats. After extraction, the crushing (process of transferring a force amplified by mechanical advantage through a material made of molecules that bond together more strongly, and resist deformation more, than those in the material being crushed do) mills collect the stones from the quarry and put them in different categories after crushing. Single stone (uncrushed) is sold at Tk. 35-40 per cubic feet and crushed stone at Tk. 75-80. During the dry season, especially from October to April, is the best time for extraction. During this time, about 450,000 cubic feet stones of various categories are collected every day from the quarries in Sylhet area. The pace of extraction slows down with the beginning of monsoon. However, about 100,000

cubic feet stones can be collected every day during off-season. During the peak season, about one thousand trucks carry about 400,000 cubic feet stones every day from the quarries of Sylhet and the government earns about Tk. 784,000 revenue a day from the trucks carrying the stones. The government gets about Tk. 20.36 million revenue every month from the quarries in Sylhet region during the peak season. The miners pay Tk. 1.96 per cubic feet stone to the government for extracting stones from the quarries.

## Problem statement

In Bangladesh, the most important source of sand and gravel is from in-stream quarrying and mining, which originate from diverse parts of the Sylhet division. The majority of the land in Sylhet, which has borders with India, from Goainghat Upazila to Chhatak Upazila under Sunamganj district, is bordered by almost barren hills and quarries. A considerable amount of stones used in the country's construction sector comes from stone quarries, mostly from Sylhet. Every day, hundreds of thousands of cubic feet of stones are being extracted from the quarries (Dev, 2014). The stone business is mainly dependent on natural resources but these resources will be exhausted in the stream of time. Therefore, the growth of such booming business will face hard time sustaining in the interim period as well as the construction and employability related to stone business will get into serious trouble. For this reason, there is a necessity to conduct a study that can determine factors affecting the growth of stone business.

## Literature review

The British East India Company's Resident Collector Robert Lindsay wrote about extracting limestone and iron ore from the Khasia hills. Stones that rolled downstream with the current have long been collected and sold by locals (Mahmood, 2009). The Piyain and Dauki rivers in Gowainghat Upazila in Sylhet, a source of seventy percent of the country's stone supply; Jaflong and Bholagonj are the main sources for natural stone (Khan, 2009).

In this study, several factors such as entrepreneur's age, education, experience, and family background were chosen because various researchers had found a significant relationship between these factors with the growth of small and medium enterprises (Bigsten & Gebreyesus, 2007; Barringer, Jones, & Neubaum, A Quantitative Content Analysis of The characteristics of Rapid-Growth Firms And Their Founders, 2005; Goedhuys & Sleuwaegen, 2010; Littunen & Virtanen, 2006; Storey, 1994). Middle-aged entrepreneurs are likely to have experience and more energy, and as such they are most likely to establish and manage a business which will grow faster than is the case for younger ones. In this regard, empirical studies have found an inverted U-shaped relationship between the entrepreneurs' age and the growth of small and medium enterprises (Reynolds & White, 1997; Van Praag, 2003). Entrepreneur's age is significantly associated with the continuation of stone business in Bangladesh (Ahmed & Mynuddin, 2016). Education is significant depends on the type of education entrepreneurs enjoyed as well as the type of industry the business belongs to (Barringer & Jones, Achieving Rapid Growth-

Revisiting The Managerial Capacity Problem, 2004; Dimov & Shepherd, 2005). Effective and successful formal education is the only way to build as well as develop the human skills, expertise and competence required for the growth and development of small and medium enterprises in LDCs (Essien & Udofia, 2006). The children of entrepreneurs should be more likely to form successful businesses than other people (Cooper, Folta, & Gimeno-Gascon, 1992; Duchesneau & Gartner, 1990; Mungai & Velamuri, 2010). It is assumed that having at least one self-employed parent not only helps to develop the human capital of the child but also modifies expectations about what business ownership entails (Niittykangas & Tervo, 2005). Individuals are more likely to be successful in their businesses for several reasons, such as an ability to seek managerial expertise from their parents in case of business problems, easier access to information on the market as well as on other related issues (Ardichvili, Cardozo, & Ray, 2003; Duchesneau & Gartner, 1990; Krauss, Frese, Friedrich, & Unger, 2005; Mungai & Velamuri, 2010; Sorensen, 2007).

The dependent variable in this study is stone business growth. This growth can be measured by several attributes such as sales, employment, assets, profit, market share and productivity. Business growth, in this study, is defined in terms of change in the level of investment, duration of business (experience), product sales location, number of employees employed and so on along with business environmental factors. It is worth noting that researchers encounter problems in obtaining financial data, especially when dealing with private firms (Dess & Robinson, 1984). The unpreparedness of small

business owners in terms of capital prior to going into business is said to be accountable for their untimely failure' (Ezeh & Onodugo, 2002). People with more start-up experience are more likely to have gathered much of the valuable information relating to business creation and growth (Politis, 2005; Unger, Rauch, Frese, & Rosenbusch, 2009). Capital and natural resources are inert factors of production, human beings are the active agents who accrue and amass capital, exploit natural and material resources, put up social, economic and political organization and carry forward national development. Without a doubt, a country which is incapable to build and develop the skills and knowledge of its citizens and utilizes them effectively in the economy will not be able to develop anything else (Cosson, 2003). Business performance directly presents the output of products and services, utilization of human resources, growth of sales, and transaction frequency with customers, while profits or goal achievement are the final test of profit making, employee performance, and organizational effectiveness in an enterprise (Chen S., 2010).

The term business environment represents all forces, factors and institution that are beyond the control of the business and affect the functioning of a business enterprise. These include customers, competitors, suppliers, government and social, political, legal and technological factors etc. While some of these factors may have direct influence over the business firm, others may operate indirectly (Duncan, 1972). Business environment can be broadly categorized into internal and external environment with the former comprising variables or factors within the control and manipulation of the firm to attain set objective while the latter encompasses factors that are outside the control and

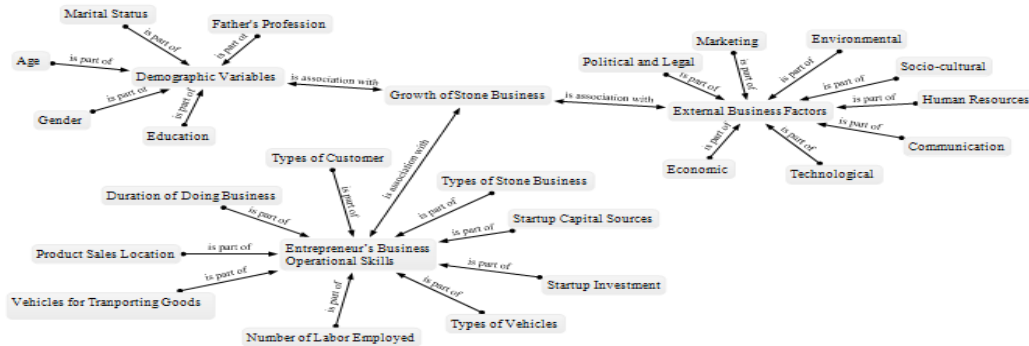
manipulation of the firm (Adebayo, Ogunyomi, & Ojodu, 2005). External business environment and their factors help visualize the analysis of business survival and growth in an attempt to enhance understanding of how environmental factors work together with the variables of business survival and growth to determine the future of business organization (Ogundele & Opeifa, The Influence Of External Political Environment On The Processes Of Entrepreneurship, 2004). Environmental changes are continuously exerting new pressures on company performance and in order to adapt with these changes, companies often formulate and implement strategies to reorganize and reform the way products are manufactured and distributed to final consumers. Thus, the impact of environmental factors on business performance towards profit objective is found to have increasingly stronger interrelationships which require more sophisticated business strategies (Adeoye, 2012). More than half of newly set up businesses survive beyond five years. Hence, the identification of factors which empirically lead to entrepreneurial success/failure would assist in equipping small business owners with the necessary managerial skills to survive in today's competitive environment as well as exploit several strategies that will improve their operational efficiencies; however, inflationary trend, infrastructural facilities accessibility and government policy are barriers to business growth and survival (Obasan, 2014). Firm must develop a plan that will help it to cope with the various environmental forces

(Oluremi & Gbenga, 2011). Firm perception of the nature of the business environment is a function of its size and industry (Ogundele, Management and Organization Theory and Behavior, 2005). Poor marketing, inadequate enabling environment were viewed by 30 percent as the major factor to small and medium enterprises growth (Imoisi & Ephraim, 2015). The dynamic and rapidly changing business environment in which most businesses operate has made business environment to have significant influence on organizational survival and performance (Alexander & Britton, 2000). Organizational performance can be significantly affected by the operation environment and business strategies; therefore, appropriate coordination, operation, environment and business strategies yielded remarkable effects on organizational performance (Yu, 2010). Fundamental impacts on the business model (including competitors, suppliers, customers, alternative products, newcomers) guided by environmental changes; therefore, presentation of completely new products and activities in the value chain is necessary, companies need to re-identify the boundaries of their business (Vecchiato & Roveda, 2011).

## Objectives of the study

To find out whether demographic profile of the entrepreneur, entrepreneur's business operational skills and external business factors have any influence on the growth of stone business of Sylhet district in Bangladesh.

## Conceptual framework



## Hypotheses

**H<sub>1</sub>:** Entrepreneur's demographic variables significantly influence stone business growth

**H<sub>2</sub>:** Entrepreneur's business operational skills considerably influence stone business growth

**H<sub>3</sub>:** External business factors significantly correlated with stone business growth

## Research Method

In this study, communicating (interview) and distributing questionnaire are the main method to analyze the determinants of stone business investment growth on entrepreneurs' demographics, business operational skills and business environmental factors. This study is based on both the primary and secondary data. The primary data were collected from respondents directly with the help of survey interview schedule. Secondary data were collected from reputed journals, newspapers and websites.

Entrepreneurs associated with stone business of Sylhet district in

Bangladesh, is the target population. The sampling frame is the two Upazila of Sylhet district, Companyganj and Gowainghat, consists of seven important locations of stone business such as Bholagonj, Pawra, Kolabari, Jaflong, Bisnakandi, Hadarpar and Salutikor. According to the estimation of an executive member of Cooperative Society of Stone Quarry Businesspersons (CSSQB) in Jaflong (Ahmed H. , 2015), there are approximately two thousand entrepreneurs have valid trade license related to stone business around two Upazila (survey study area). Researchers take five percent of two thousand entrepreneurs as representative sample ( $2000 \times 5\% = 100$ ) and distribute one hundred twenty questionnaire for survey. The survey samples were selected at random by applying systematic random sampling technique. There were ninety nine filled questionnaires found to be correct and rests of them were not found valid. So, the sample size was ninety-nine entrepreneurs. The survey interview schedule was constructed by the researchers themselves; on an average survey interviewing time was 25-30

minutes. Survey interview had been conducted using standard questionnaire with two parts. Part I, consists of demographic and entrepreneurs' business operational skills related information such as age, gender, location of business firm, education, sources of startup capital, present capital, types of stone business, product sales location etc. Part II contained eight external business factors consist of thirty-seven variables, were designed in a Likert's scale format which is given five point rating scale ranges from

strongly disagree to strongly agree. The researchers carried out field work for the survey over a period of 45 days during May and June in 2015. Data were analyzed with the help of frequency table and cross tabulation (descriptive statistics). Cronbach alpha was used to justify the reliability of the variables and multiple regression analysis are used to reveal the variation in the investment growth of stone business on debit card. The gathered data was analyzed through Statistical Package for Social Sciences (SPSS) version 20.

## Results and discussion

**Table 1** Demographic profile

	Frequency	Percentage
<b>Valid survey cases</b>	99	100
<b>Gender</b>		
Male	99	100
<b>Age</b>		
Lowest thru 25	14	14.1
26 to 35	51	51.5
36 to 45	24	24.2
46 thru Highest	10	10.1
<b>Marital Status</b>		
Married	72	72.7
Unmarried	27	27.3
<b>Education Level</b>		
Below SSC	19	19.2
SSC	42	42.4
HSC	27	27.3
Diploma	1	1.0
Graduate	10	10.1
<b>Father's Profession</b>		
Farmer	23	23.2
Unrelated Business	37	37.4
Teacher	7	7.1
Stone Business	17	17.2
Private service	4	4.0
Other combination	11	11.1
Source: Field survey, 2015		



The profile of the respondents is presented in table 1. All respondents are male, 52 percent is belongs to the age group 26 to 35; whereas 24 percent is from the age ranges 36 to 45, 73 percent is married, no one has completed post-graduation but 42 percent has completed Secondary School Certificate (SSC) and

10 percent have completed graduation. Only 17 percent respondent's father has stone business, but almost 37 percent businesspersons' father's profession is not related to stone business (unrelated business) and 23 percent of their father's profession was farmer.

**Table 2** Entrepreneurs' business operational skills information

	Frequency	Percentage
<b>Valid survey cases</b>	99	100
<b>Location of Business Firm</b>		
Bholagonj, Pawra and Kolabari	44	44.4
Jaflong	30	30.3
Bisnakandi and Hadarpar	21	21.2
Salutikor	4	4.0
<b>Types of Stone Business</b>		
Storing and selling Single (stone size 1 inch or below) , Botu(stone size 1 – 5 inches) and Bolder (5 inches or above)	30	36.6
Digging and selling	16	19.5
Chrushing Machines	13	15.9
All (Digging-Storing-Crushing-Selling)	6	7.3
Storing and selling Bolder, Single, Botu withCrushing machines	5	6.1
Storing and selling Bolder, Single, Botu with Digging and selling	6	7.3
Other combinations	6	7.3
<b>Sources of Startup Capital</b>		
Self	28	28.3
Family	27	27.3
Relatives	1	1.0
Friend/s	1	1.0
Other	10	10.1
Self and family	10	10.1
Self and bank	10	10.1
Self, family and bank	12	12.1
<b>Startup Capital</b>		
Lowest thru Tk. 1000000	37	37.4
Tk. 1000001 to Tk. 2000000	32	32.3
Tk. 2000001 to Tk. 3000000	9	9.1
Tk. 3000001 to Tk. 4000000	5	5.1
Tk. 4000001 to Tk. 5000000	12	12.1
Tk. 5000001 thru Highest	4	4.0
<b>Continuation of stone business</b>		
Lowest thru 5 yrs	45	45.5



6 to 10 yrs	34	34.3
11 to 15 yrs	15	15.2
16 yrs thru Highest	5	5.1
<b>Number of labor working at present</b>		
Lowest thru 25	49	49.5
26 to 50	21	21.2
51 to 75	3	3.0
76 to 100	7	7.1
126 to 150	7	7.1
151 to Highest	12	12.1
<b>Types of Vehicle</b>		
No vehicle	34	34.3
Big Tractor	34	34.3
Truck	20	20.2
Engine Boat	2	2.0
Paddle Boat	4	4.0
Big tractor and truck	5	5.1
<b>Types of Customer</b>		
Individual user	6	6.1
Seller / Agencies	64	64.6
Industrial user	1	1.0
All (industrial user, seller/agencies and industrial user)	21	21.2
Individual user and Seller/Agencies	4	4.0
Seller/Agencies and Industrial user	3	3.0
<b>District-wise Major Buyer of Product</b>		
Dhaka	26	26.3
Narayanganj	1	1.0
Chittagong	2	2.0
Dhaka and Barishal	4	4.0
Dhaka and Narayanganj	19	19.2
Dhaka and Chittagong	9	9.1
Other combination	31	31.3
Dhaka and Sylhet	7	7.1

Source: Field survey, 2015

Entrepreneurs' business management skills related information is depicted in table 2. Business firm belongs to Companyganj Upazila is 44 percent and 56 percent is from Gowainghat Upazila. 36.6 percent businessperson possesses storing and selling Bolder, Single and Botu sort of business type, 28 percent had self-financing for conducting business and 32 percent had managed

their capital by self-financing and with the help of bank and family members. Almost 84 percent of the stone businessperson had startup capital lowest through Tk. 40,00,000 and 37 percent had initial capital of lowest through Tk. 10,00,000 while 45 percent of entrepreneur is doing business for less than 5 years whereas 34 percent of them doing business from 6 to 10 years.

More than 151 labors are maintained by 12 percent entrepreneur and 21 percent of them maintaining a labor group of 26 to 50. 34 percent entrepreneur doesn't have own vehicle for transporting goods; 20 percent has truck and 34 percent of them have big tractor. Entrepreneurs' major customer is

seller/agencies who occupy 64 percent hold and 21 percent is the combination of individual user, seller/agencies and industrial user. 26 percent of major buyer of the stone products is from Dhaka and 19 percent buyer is from Dhaka and Narayanganj.

**Table 3** Cross tabulation of Startup capital and investment increase by percent

Startup capital	Investment increase by percent						Total
	Lowest thru 200	201 - 400	401 - 600	601 - 800	801 - 1000	1001 thru Highest	
Lowest thru Tk. 1000000	19.2%	6.1%	3.0%	2.0%	1.0%	6.1%	37.4%
Tk. 1000001 to Tk. 2000000	14.1%	11.1%	3.0%	1.0%	0.0%	3.0%	32.3%
Tk. 2000001 to Tk. 3000000	1.0%	2.0%	3.0%	2.0%	1.0%	0.0%	9.1%
Tk. 3000001 to Tk. 4000000	2.0%	3.0%	0.0%	0.0%	0.0%	0.0%	5.1%
Tk. 4000001 to Tk. 5000000	5.1%	3.0%	1.0%	2.0%	1.0%	0.0%	12.1%
Tk. 5000001 thru Highest	1.0%	1.0%	0.0%	0.0%	1.0%	1.0%	4.0%
<b>Total</b>	<b>42.4%</b>	<b>26.3%</b>	<b>10.1%</b>	<b>7.1%</b>	<b>4.0%</b>	<b>10.1%</b>	<b>100.0%</b>

Source: Primary Data

Initial investment has turned up with a good amount of return. The table 3 reveals 42.4 percent entrepreneur's investment increased by lowest through 200 percent. Six percent of Entrepreneurs who invested less than Tk.1000000, hence their capital

increased by more than 1000 percent. 26.3 percent entrepreneur's investment increased by 201 through 400 percent; 10.1 percent entrepreneur's investment consecutively increased by 401 through 600 percent and more than 1000 percent.

**Table 4** Cross tabulation of Types of Stone Business and investment increase by percent

Types of Stone Business	Investment increase by percent						Total
	Lowest thru 200	201 - 400	401 - 600	601 - 800	801 - 1000	1001 thru Highest	
Storing and Selling Bolders, Singles and Botu	20.2%	10.1%	4.0%	1.0%			35.4%
Digging and Selling	12.1%	2.0%	2.0%		1.0%	2.0%	19.2%
Crushing Machines	5.1%	5.1%		4.0%	1.0%	2.0%	17.2%
All (Digging-Storing-Crushing-Selling)	2.0%	1.0%	1.0%		1.0%	3.0%	8.1%
Storing, Selling, Bolders, Singles, Botu and Crushing machines	2.0%	3.0%			1.0%	1.0%	7.1%
Storing, Selling, Bolders, Singles, Botu and Digging & selling	1.0%	3.0%	1.0%	1.0%		1.0%	7.1%
Other combinations		2.0%	2.0%	1.0%		1.0%	6.1%
<b>Total</b>	42.4%	26.3%	10.1%	7.1%	4.0%	10.1%	100.0%

Source: Primary Data

It (table 4) shows 20.2 percent storing and selling Bolders, Singles and Botu sort of stone business is able to make capital grow by 200 percent. Entrepreneurs (3 percent) have all (Digging-Storing-Crushing-Selling) type

of stone business, are able to increase capital by more than 1000 percent. Entrepreneurs (12.1 percent) are doing digging and selling stone, able to grow investment by 200 percent.

**Table 5** Reliability of variables

Variable	Factor category with number of items	Overall items	Reliability (Cronbach's Alpha)
External Business factors	Socio-cultural (4)	37	.623
	Economic (7)		
	Marketing (4)		
	Human resource (5)		
	Natural environmental (6)		
	Communication (3)		
	Political and legal (5)		
	Technological (3)		

Source: Primary Data

After identifying the external business factors for the study, a scale to measure each factor was selected and overall scale reliability was checked by Cronbach's Alpha Reliability test. In this study, the scale selected is having a Cronbach's Alpha value of 0.623 (table 5) for external business factors. It is

suggested that if the reliability coefficient exceeds 0.60, then the items are likely to have high degree on internal consistency (Malhotra, 2011-12, p. 279). The Cronbach's Alpha results show a positive relationship with the items considered for this study.

**Table 6** Multiple regression analysis

Overall Model			
Variables	B	t-value	Sig.
Constant	5.231	19.366	.000
Duration of business	.636	8.314	.000
Types of stone business	.221	2.977	.004
Communication factors	.185	2.771	.007
Sources of startup capital	.139	2.127	.036
Technological factors	-.167	-2.420	.017
R <sup>2</sup>		.632	
Adjusted R <sup>2</sup>		.612	
F-Value		31.975	
Significant		.000	

From table 6, the results show the multiple regression analysis, with five independent variables (duration of business, types of stone business, communication factors, sources of startup capital and technological factors) and the dependent variable (log transformed growth of stone business). This analysis was conducted to predict the percentage of dependent variable, where independent variables are recorded simultaneously. Sixty-one percent (61.2%) of the overall variance (growth of stone business) was explained by the independent variables

(duration of business, types of stone business, communication factors, sources of startup capital and technological factors). Duration of business (B = .636, t = 8.314), types of stone business (B = .221, t = 2.997), communication factors (B = .185, t = 2.771) and sources of startup capital (B = .139, t = 2.127) is significant and positively act upon the investment growth of stone business. Technological factors (B = -.167, t = -2.420) is also significant but negatively act upon the growth of stone business.

**Table 7** Collinearity statistics of multiple regression analysis

Variables	Tolerance	VIF
Duration of business	.675	1.481
Types of stone business	.720	1.389
Communication factors	.904	1.106
Sources of startup capital	.922	1.085
Technological factors	.835	1.198

The table 7 shows the result of the collinearity statistics of the multiple regression analysis. It (table 7) indicates that multicollinearity do not exist, as the values of tolerance are greater than 0.1 and the variation inflation factors (VIF) for all independent variables are less than 10 (Hair et al., 1998). When the

tolerances are close to 0, there is high multicollinearity and the standard error of the regression coefficients will be inflated. A variance inflation (VIF) factor greater than 2 is usually considered problematic, and the smallest VIF in the table is 1.085.

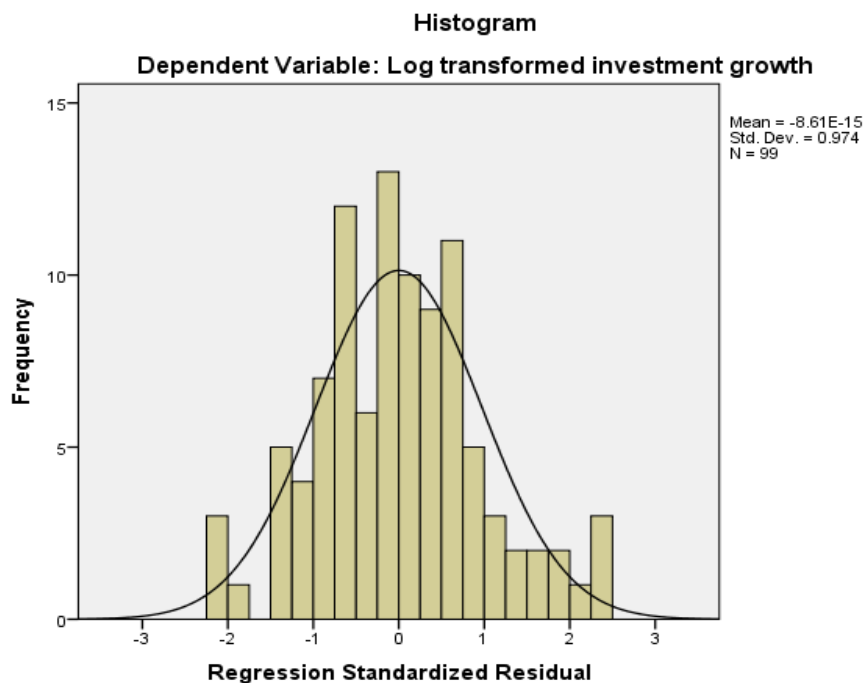


Figure 1

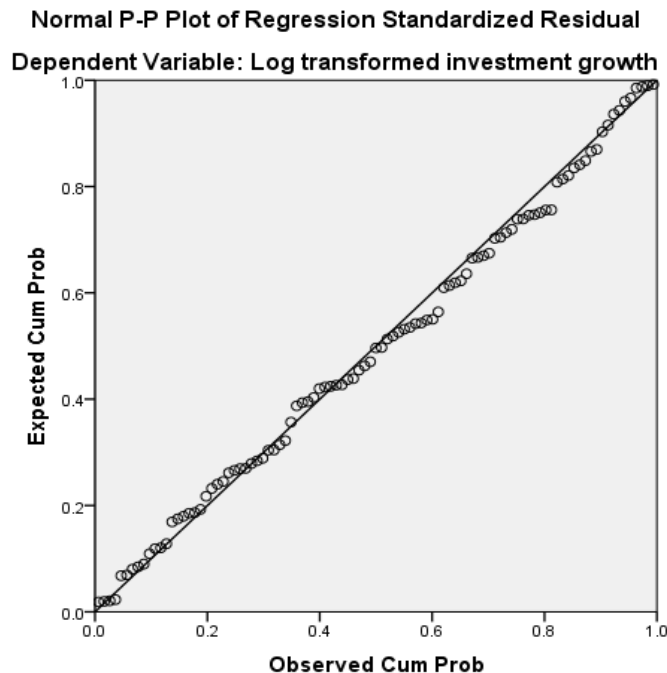


Figure 2

Figure 1, represents the histogram of standardized residuals compares the distribution of the residuals to a normal distribution. The smooth line represents the normal distribution. The closer the frequencies of the residuals are to this line, the closer the distribution of the residuals is to the normal distribution. Figure 2, represents a binned probability-probability plot comparing the standardized residuals to a normal distribution. Here, the slope of the plotted points is less steep than the normal line, the residuals show greater variability than a normal distribution; if the slope is steeper, and the residuals show less variability than a normal distribution.

### Description of the fitted model

Growth of stone business =  $5.231 + 0.636 (\text{duration of business}) + 0.221 (\text{types of stone business}) - 0.167 (\text{technological factors}) + 0.183 (\text{communication factors}) + 0.139 (\text{sources of startup capital})$

Variables like business duration, stone business types, technological factors, communication factors and sources of startup capital play important role for the growth of stone business. All variables have positive impact except technological factors. The *B* value (Table 6) shows that one percent increase in technological factors result to decrease in stone business growth by

0.167 percent. Here, one percent increase in duration of business, stone business types, communication factors and sources of startup capital result to

increase in the growth of stone business by consecutively 0.636, 0.221, 0.183 and 0.139 percent.

**Table 8** Results of hypotheses

Hypotheses	Findings
<b>H<sub>1</sub>:</b> Entrepreneur's demographic variables significantly influence the growth of stone business	Rejected
<b>H<sub>2</sub>:</b> Entrepreneur's operations skills of business (duration of business, types of stone business and sources of startup capital) considerably influence the growth of stone business	Supported
<b>H<sub>3</sub>:</b> External business factors (communication and technological) significantly correlated with the growth of stone business	Supported

The outcomes of this study suggest that two external business factors and three business operational skills are significantly related to stone business growth in Sylhet. This study exemplifies a positive light towards stone business in Bangladesh. From the result of the hypotheses, it is clearly seen that entrepreneur's demographics are not significantly contributing towards the growth of stone business; entrepreneurs' business operational skills and external business factors can play significant impact on the growth of stone business of Sylhet in Bangladesh.

## Conclusion

There are rarely researches focused on dominant factors influencing the growth of stone business in Sylhet, Bangladesh. Stone crushing industry in Bangladesh is an unorganized industry sector scattered different areas over Sylhet. It is basically a labor intensive small scale industry where many of the operations

are performed manually. Most of the plant and machinery has been conventional in nature and fabricated locally and has lacunae in its design, layout and operation etc. The success of every business depends on adapting itself to the environment within which it functions (Duncan, 1972). The stone business is expected to grow further keeping in view the future plans for development of infrastructure of roads, canals and buildings that are required for overall development of the country. The benefits of stones can never be ignored as these precious natural assets contribute huge in the construction sector. Therefore, it necessitates finding causes to sustain the development of stone business in developing countries like Bangladesh and this study clearly shows entrepreneur's business experience, types of business, sources of startup capital, communication and technological factors are significantly contributing towards the growth of stone business.



## Policy suggestions

The stone crushing units is recognized socially and economically an important sector creates substantial turnover and employment to unskilled labor. But environmental pollution by way of the fugitive emissions affects the human health; the workers are employed at different places as per the nature of work and are exposed to silica dust of different concentrations. Government should be well equipped to estimate the pollution at regular intervals. Otherwise, absence of proper equipment to measure the pollution level, giving free hand to industry owners can pollute without any fear.

As transportation of stone over long distances adds to cost of the crushed stone products, the crushers need to be necessarily located nearer to the demand centers such as Cities, Bridges, and Canals. Stone Crushers also need electricity supply and large number of man power in its operation. It also needs access roads for the movement of extracted stone as well as crushed stone products. That is why; most Stone Crushers are located along the periphery of cities or in the vicinity of major construction projects. The communication facilities need to be improved; as the roads through which stones are carried, very poor in condition and becomes useless to transport anything other than stones.

Management should provide ownership to the workers of the stone quarry that helps the workers to earn more and improved economic conditions and feel responsive regarding the maintenance and development of the units.

The living standards, education and health facilities for the workers have to be improved to a large extent. These

measures can useful to the stone business units, works and to control pollution at some extent.

More coordination among different Government agencies and departments is required to supervise the local industries in controlling pollution.

Corruption and Political interference in dealing of environmental aspects should be brought down to zero level. It may be possible through strict punishment to the violators.

Stone crushing units must be taxed heavily on account of pollution.

The NGOs, researchers, common citizen, and media must be more vigilant and active in containing the pollution and in supporting the concerned authorities.

Various options of low cost, recycled, pollution free technologies have to be made available by the Government to the unit owners to adopt them easily. Government should provide more subsidies to buy eco-friendly technology.

Fly ash bricks can be used to construct High wind breaking walls around stone crushing units.

Government and other financial agencies can provide short or long term fund in case of financial need; financial assistance should link with low interest rate.

## Research implications

The research findings will be very helpful in understanding the factors affecting the growth of stone business in Bangladesh especially in Sylhet region. This study has unveiled certain

determinants that contribute the growth of stone business. If any researcher has the ambition to look for the factors that heavily contributes the growth of stone business; this study will provide good insights to reach at conclusion. However, such type of study in Bangladesh context will open the arena of business researchers to find constructive policy suggestions that help achieving the desired growth on such business.

## Limitations of the study and suggestions for further research

Some entrepreneurs were reluctant to provide the necessary information due to the fear that the information might be used against them. It was a challenge to find the businessperson free because they were always busy with customers and routine task.

The study has some other limitations too. First, this study is limited to only Sylhet district in Bangladesh, which will limit the generalization. The survey method has been used for data collection therefore the responses might or might not be free from personal biases. Further, the study considered only demographic, business operational skills and external business factors of stone business. Even though limitations exist, the study made significant contributions in context of the growth of stone business in Bangladesh perspective.

In this study, business duration, stone business types, technological factors, communication factors and sources of startup capital were identified as the antecedents of the growth of stone business. However, there might be other factors that affect the growth and other predictor such as demographic variables along some internal business factors should be explored in future studies.

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