

## Sustainability Framework of Manufacturing Micro, Small and Medium Enterprises in SOCSARGEN, Philippines

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**Abstract** - The micro, small and medium enterprises (MSMEs) are the backbone of the economy. They drive the economic stability of a region or a country by generation of employment opportunities, rural industrialization and development, indigenous resources utilization, creation of linkages with existing industries and entrepreneurial development. The purpose of this study is to determine the sustainability framework of the manufacturing MSMEs in South Cotabato, Sarangani Province, and General Santos City (SOCSARGEN) a region in Southern Philippines. The Triple Bottom Line (TBL), an accounting framework that incorporates the social, financial and environmental performance was employed to peruse sustainability. The study is descriptive and correlational. It investigated empirically the region's manufacturing MSMEs in terms of location, years in operation, form of organization, value of assets, and number of employees; the profile of the entrepreneurs in terms of age, gender, education, training, business experience, and firm management. It also unraveled the perception of the owners/managers on the sustainability of their firms. The results were analyzed using descriptive statistics and multiple regression analysis. The data were culled from the owners/managers of manufacturing MSMEs in SOCSARGEN through survey questionnaire. The findings of the study revealed that the enterprise characteristics, entrepreneurial characteristics and business environment are the significant factors that influenced the sustainability of the manufacturing MSMEs in SOCSARGEN. The result provided the impetus for the learned accounting teachers for their role in contributing to the sustainability of the manufacturing MSMEs in SOCSARGEN in terms of financial accounting and reporting, management accounting, accountancy education, auditing, assurance, information technology and business regulations to improve enterprise characteristics, entrepreneurial characteristics and the business environment.

**Keywords** - sustainability, MSMEs, triple bottom line, entrepreneurial characteristics, business environment

### I. INTRODUCTION

Sustainability is a pertinent study for MSMEs because they compose the greatest bulk of the economy and the most vulnerable to failure. "Small businesses are here today and gone tomorrow" can often be heard about MSMEs particularly the micros. MSMEs represent 99.57 % of the total establishments in the country according to the Department of Trade & Industry [DTI] (2018). With the very large proportion of MSMEs in the economy the need for sustenance or being able to continue or endure over a period of time is vital. Sustainability of these enterprises has a crucial role as MSMEs contribute greatly to the nation's economic expansion (DTI, 2015).

The MSMEs statistics (DTI, 2018) reported that 89.63 percent are micro enterprises, 9.5 percent belongs to the small category and 0.44 percent are medium enterprises. The large enterprises constitute only 0.43 percent of the total firms in the country. MSMEs generated 63.3 percent of the total jobs. Another contribution of MSMEs is the export revenues of 25 percent. Sixty percent of the exporters are the MSMEs. The manufacturing industry led among the industries in contributing to the country's economic growth (Business Wire, 2018). The manufacturing sector composed 12.5% in the total MSME sector distribution. The sector contributed 16.1% in employment and 6.87% in value added, the largest among the sectors, according to DTI (2018).

The biggest challenge which MSMEs face is being able to sustain their performance, and hence succeed and survive (Mabhungu & Van Der Poll, 2017). In the U.S., over 50% of small businesses fail in the first year and 95% fail within the first five years based on 2002-2003 data (Titus, 2008). In South Africa, 40% of new business ventures fail in their first year, 60% in their second year, and 90% in their first 10 years of existence (Ramukumba, 2014). In the Philippines many new businesses fail during their first three years (Diaz & Fajardo, 2015).

#### Review of Related Literature

**The Micro, Small and Medium Enterprises in the Philippines.** The Philippine businesses are categorized by asset size and by number of employees as shown in Table I by the Small and Medium Enterprise Development (SMED) and as approved by the Bangko Sentral ng Pilipinas (BSP), through Monetary Board Resolution 328 dated March 2003 (DTI, 2015).

**Table 1**  
*Firm Categories by Asset Size and Number of Employees*

Category	Total Assets*	Number of Employees
Micro	P 3,000,000 or less	1 – 9
Small	3,000,001 – 15,000,000	10 – 99
Medium	15,000,001 – 100,000,000	100 – 199
Large	more than 100,000,000	more than 200

\*excluding the value of land

**The SOCSARGEN Region.** The SOCSARGEN Region is composed of South Cotabato, Sarangani Province and General Santos City. Figure 1 shows the map of SOCSARGEN, Philippines. South Cotabato (Provincial Government of South Cotabato) is the major producer of pineapple, corn, papaya, abaca and cassava in the region. South Cotabato is a sound and stable location for business. Dole Philippines, one of the largest pineapple plantations in the world is in operation in South Cotabato since 1963. Dole Philippines exports an array of fruit products to the international market. General Santos City is recognized as one of the most competitive cities of the country by the National Competitiveness Council of the Philippines [NCC] (NCC, 2018). It is also among the list of Highly Urbanized City category of the country with world-class infrastructure such as the international airport, the wide and well-paved roads, clean and spacious wharf and other infra facilities (General Santos City Economic Management and Cooperative Development Office [CEMCO], 2018). The city is also the principal trading port catering South Cotabato, Cotabato, Sultan Kudarat, and Sarangani. There are six tuna canning factories located in the city. The fishport in General Santos City is the country's most modern fishport with world class facilities and amenities that supplies Sashimi Grade Tuna to the world. There are two universities located in the city, the Mindanao State University and Notre Dame of Dadiangas University. There are as well a number of banks operating the city. Sarangani Province, the 2018 fifth most competitive province in the Philippines (NCC, 2018) is front door to BIMP-EAGA (Brunei Darussalam-Indonesia-Malaysia-Philippines East Association of Southeast Asian Nations Growth Area), a sub-regional economic cooperation designed to spur economic development in the lagging sub-economies.



Figure 1. Map of SOCSARGEN, Philippines

**Issues Confronting MSMEs.** According to Titus (2008), the 12 broad causes that lead to a small business failure are: lack of industry experience, inadequate financing, lack of adequate cash flow, poor business planning, management incompetence, ignoring the competition, unworkable goals, diminished customer base, uncontrolled growth, inappropriate location, and poor system of control and lack of entrepreneurial skills.

Other researches highlighted the causes of failure of MSMEs as limited access to finance and high cost of finance, lack of marketing skills and market knowledge, inadequate management and entrepreneurial skills, lack of access to infrastructure, lack of access to land, lack of information and hostile regulatory environment.

In the Philippines, MSMEs experience many hindrances to further growth and productivity. These challenges include credit constraints, unwieldy registration procedures and strict

regulatory environments, and other constraints related to an economic playing field that is not level between large and small firms (Mendoza & Melchor, 2014). MSMEs have lower probabilities of survival than larger firms, leading to high rates of market entry and exit across nearly all economic sectors. To go beyond survival, MSMEs will need to brave successful business transformation in various dimensions of their operations: enhanced entrepreneurial skill, innovation in process and product development, more successful collaboration across MSMEs and with larger firms, and improved crisis resilience among other factors.

Harvie and Charoenrat (2015), however, pointed out that despite the perceived weaknesses of micro, small and medium enterprises, these firms have not been swept away with the process of globalization and regional integration, but, rather, the role and contribution of these firms have changed and evolved which have enabled many micro, small and medium enterprises to remain internationally competitive and collectively be an important source of employment generation.

**Success Factors.** A great number of success factors are presented in literature. Machado (2016), Dobbs and Hamilton (2007) and several other researchers reviewed strands of literature on growth of small businesses. Lampadarios, Kyriakidou and Smith (2015) analysed there is no coalescing theory to assimilate or integrate all aspects of MSMEs success. The applicability of these success factors appears to be relative and varies with the business environment, that is, the industry and the country or region these enterprises are located. A success factor may be of great importance in one industry or country or region, but it may not necessarily be of the same importance in another. Knowledge remains more fragmented than cumulative. Nonetheless, MSMEs tend to exhibit high failure rates and poor performance levels, necessitating for more empirical studies to investigate the sustainability in different business setting.

**Sustainability.** Business sustainability (University of Wisconsin Sustainable Management) is the management and coordination of environmental, social and financial demands and concerns to ensure responsible, ethical and enduring success. Business sustainability is essential to the long-term prosperity of business enterprises (Posner, 2014). Sustainability principles serve to maximize opportunities and to minimize the negative impact of the core operations of the business have on the environment and the communities and economies in places where they operate (Salimzadeh, 2016.). Simply, sustainability is success that endures.

**Related Studies on Various Variables.** The study of Hampel-Milagrosa (2014) on Micro and Small Enterprise Upgrading in the Philippines used as determinants of MSMEs upgrading the entrepreneur characteristics, enterprise characteristics, personal and professional networks and business environment. Entrepreneur characteristics encompass age, gender, education, work experience, motivation and risk-taking as indicators. Enterprise characteristics include enterprise age, location, sector, formality, access to finance and absorptive capacity. Personal and professional networks embrace personal networks, professional networks which include horizontal professional linkages and vertical professional linkages. The business environment considers three aspects: economic stability, market competition and the regulatory business environment. Another literature authored by Lampadarios, et al (2015) developed a new framework for small business success enumerating Entrepreneurial factors (age, education level, entrepreneurial orientation, gender, personality, prior work experience and management skills), Enterprise factors (age and size of company, business networks,

customer relations management, financial resources, internationalisation, human capital, market and product development, marketing and strategic planning) and Business environment (political, economic, socio-cultural, technological, legal and regulatory, ecological and environmental).

**Research Gap.** There are limited research studies on business sustainability in the Philippines as this is a new awareness in business endeavored by the 1987 Brundtland report of the World Commission on Environment and Development (WCED) that highlighted three fundamental components of sustainable development which are social equity, economic growth and environmental protection. Business sustainability from then has evolved from financial profitability focus and now to include the social and environmental dimensions. Business enterprises are now incorporating sustainability principles into their operations. It has come to be a strategic business motivation for most companies as it drives company growth through increased customer support and profit from having more savings and less resource wastage, thus becoming a key variable in any company's objective of obtaining competitive advantage (Montiel, 2008). It is critical to study the role of business sustainability in the perspective of manufacturing MSMEs sector. MSMEs struggle with limited resources to sustain their business operations but inconspicuously are being the primary source for the greatest number of the world's production (Hojnik & Rebernik, 2012). According to Ocampo and Ocampo (2015) the manufacturing sector has a strong leverage with sustainability due to an inherent substantial amount of resource consumption as the result of introduction of a number of new products year after year as innovation initiatives progress, and require considerable quantity of energy and materials consumption and wastes generation contributing to an adverse effect on the community.

This study intends to determine the sustainability framework of the manufacturing MSMEs in SOCSARGEN, Philippines. This study purports to determine (1) the profile of the manufacturing MSMEs in SOCSARGEN in terms of location, years in operation, form of organization (single proprietorship, partnership, cooperative, association, corporation), value of assets and number of employees; (2) the profile of the entrepreneurs of the manufacturing MSMEs in SOCSARGEN in terms of age, gender, education, training, business experience and firm management; (3) the level of influence on the sustainability of manufacturing MSMEs in SOCSARGEN in terms of entrepreneurial characteristics, enterprise characteristics, networks, business environment; (4) which independent variable/s (entrepreneurial characteristics, enterprise characteristics, networks and business environment) significantly influences the sustainability of the manufacturing MSMEs in SOCSARGEN in terms of the People, Profit and Planet; and (5) determine if firm age moderates the relationship between entrepreneurial characteristics, enterprise characteristics, networks and business environment taken together and sustainability of the manufacturing MSMEs in SOCSARGEN in terms of People, Profit and Planet. The following hypotheses are tested in this study:

**H01.** There is no significant relationship between entrepreneurial characteristics and sustainability.

**H02.** There is no significant relationship between enterprise characteristics and sustainability.

**H03.** There is no significant relationship between networks and sustainability.

**H04.** There is no significant relationship between business environment and sustainability of manufacturing MSMEs in

SOCSARGEN.

**H05.** Firm age does not significantly moderate the effect between entrepreneurial characteristics, enterprise characteristics, networks and business environment (independent variables) to people, profit, and planet (dependent variables) sustainability of manufacturing MSMEs in SOCSARGEN.

#### Theoretical Framework

Joseph A. Schumpeter, an economist and one of the twentieth century's greatest intellectuals, developed the Theory of Economic Development in 1911. In this theory the entrepreneur is the key figure in the process of development (Langroodi, 2017). The entrepreneur is the centrality in the development process because he comes out with development in a society and sustains it. Taking high degree of risk, decisiveness, strong communication skills, creativeness, competitiveness and innovativeness characterize the Schumpeter' entrepreneur.

According to the theory as reviewed by Langroodi (2017), the entrepreneur requires two things to achieve his role. First, the entrepreneur must have the technical knowledge wherein he can introduce new products or new combinations of factors of production. Secondly, credit and capital play a vital role, thus, banks, according to the theory, are special phenomenon of development. Banks are necessary in the consummation of innovations.

An entrepreneur innovates to earn profits. The entrepreneur achieves innovation by putting through a new combination of production factors, launching new products, introducing new methods of production, expanding into new markets, and providing new forms of management. Once an innovation proved to be profitable and successful, other entrepreneurs follow and may imitate. Innovations are followed by a series of innovations, which drive to the increase of investments and catapult to prosperity.

Caroline Reeg, a specialist in private sector development and MSMEs and a research associate with the German Development Institute (DIE) integrated school of thoughts regarding the factors that affect enterprise upgrading in 2013 (Hampel-Milagrosa, 2014). Enterprise upgrading means growth or the progressing or advancing of an MSME from one category to the next category, such as, from a micro enterprise to small enterprise, from a small enterprise to medium enterprise and from a medium enterprise to a large enterprise. The factors which affect the growth of the enterprise are the internal factors which are the characteristics of the entrepreneur and the enterprise and the external factors which include the networks and the business environment. The core of the first layer focuses on the entrepreneur characteristics. The age, gender, education, work experience, aspiration and risk-taking capabilities of the entrepreneur have been the most important in empirical studies in developing and developed countries (Hampel-Milagrosa, 2014). Other literature also includes innovativeness /creativity and seeking for opportunities efforts of the entrepreneur as part of entrepreneur characteristics. In the second layer is the enterprise characteristics. It encompasses the age of the enterprise, location, sector, formality, financial management, the ability of the organization to identify, evaluate and exploit external knowledge for commercial ends such as investments in research and development and human resource development and other absorptive capacity for knowledge. The third layer relates to the interaction of the entrepreneur and the enterprise with networks as contributory to enterprise upgrading. Networks are important because they connect entrepreneurs to prospective provenance of capital, new

employees, strategic linkages, and service providers. Entrepreneurs share information and assessments of markets and technology and lessons learned from personal experience. These connections are important to an entrepreneurial company's sustainability. The fourth and outermost layer is the business environment. This surrounds the factors that contribute the context and conditions in which businesses are placed. This layer covers access to finance, availability of raw materials, access to market, government support and firm location.

John Elkington, a world authority on corporate responsibility and sustainable development, coined the Triple Bottom Line (TBL) to measure sustainability (Slaper & Hall, 2018). TBL is an accounting framework that incorporates the social, financial and environmental performance. The TBL dimensions are also called the three Ps: people, profit and planet. The people dimension considers the employees and the community wherein the business operates. It relates to social sustainability which encompasses health and wellness, personal and professional growth of employees, safer products, reduced social problems and community development (Chow & Chen, 2012). It involves the welfare of employees and internal stakeholders of the organization (Marquez, 2012). The profit dimension is the traditional way to measure sustainability through the financial statements. It correlates with sustainable competitive advantage, increased employee commitment, improved customer relationships, increase in sales and attract new customers (Roxas & Chadee, 2012). It is concerned with the ability of the organization to achieve profit that would be sufficient to keep the business going. It also represents the resources and funds that business would need to continue its operations (Marquez, 2012). The planet piece in the TBL indicates efforts to sustain the environment like managing natural resources more efficiently and reduction of production wastes. It connects with natural resource conservation, improved ecology and biodiversity, environmental risk reduction, reduced toxins, waste reduction and reduced air pollutants (Roxas & Chadee, 2012). It is also referred to environmental or ecological sustainability.



Figure 2. Triple Bottom Line

#### Conceptual Framework

Directed and guided by the theories on economic development, enterprise upgrading, and sustainability, a conceptual framework is developed for the study of sustainability of manufacturing MSMEs in SOCSARGEN. The conceptual framework is shown in Figure 3. This study investigated the influence of entrepreneur characteristics, enterprise characteristics, networks and business environment to sustainability of manufacturing MSMEs in SOCSARGEN. The entrepreneurial characteristics, enterprise characteristics, networks and business environment are the independent variables, while sustainability is the dependent variable.

Sustainability is analysed in terms of people, profit and planet indicators.

Firm age is the moderating variable in this study. According to Teruel-Carruzosa (2010) the age of the firm influences sustainability since growth was the result of the learning process and experience acquired over time.

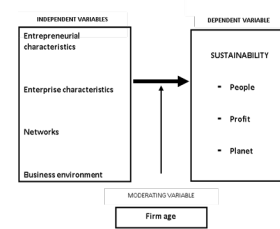


Figure 3. Schematic Representation of Conceptual Framework

#### II. RESEARCH METHOD

This study was descriptive and correlational in design. It applied descriptive statistics and multiple regression analysis to analyse the data.

The respondents of the study are owners/managers of manufacturing MSMEs registered with the Business Permits and Licensing Division of the local government units of SOCSARGEN. The study was conducted in South Cotabato, Sarangani Province and General Santos City (SOCSARGEN). SOCSARGEN is a region in Southern Mindanao, Philippines.

The survey questionnaire as the primary data gathering instrument was self-developed and validated by 3 experts. The study used a 5-point interval scale for the indicators of the independent and dependent variables. The questionnaire investigated socio-demographic variables of MSMEs in SOCSARGEN such as the location, products, firm age, form of organization, value of assets, number of employees, entrepreneurs' age, gender, education, training, business experience and firm management. The research instrument was subjected to validity and reliability tests post hoc (Cronbach's alpha 0.938). The gathered data were analysed using the Descriptive Statistics and Multiple Regression Analysis Stepwise Method through SPSS version 22. The moderation analysis was performed using Hierarchical Multiple Regression through Process software by Prof. Hayes.

#### III. RESULTS AND DISCUSSION

**Profile of the enterprise.** The biggest chunks of the manufacturing businesses in SOCSARGEN are located in General Santos City (65%) followed by South Cotabato (31%) and Sarangani Province (4%). The majority of the manufacturing MSMEs in SOCSARGEN are engaged in food production (71%), while 29% of the manufacturing MSMEs produced non-food products. About one half (48%) of the number of respondents MSMEs are operating for 5 years or less, 26% in the 6-10 years bracket, 13% in the 11-15 years bracket, 6% in the 16-20 years bracket and 7% in the 21 years and above bracket. Most of the enterprises are single proprietorship (87.4%), the remaining 12.6% are distributed to corporation (5.8%), partnership (5.2%), cooperative (1.3%) and association (0.3%). In terms of value of assets, 83% of the manufacturing MSMEs in SOCSARGEN have value of assets P3,000,000 or

less, 13% with P3,000,001 – P15,000,000, and only 4% with assets from P15,000,001-P100,000,000. For the number of employees, 79% of the manufacturing MSMEs have 1-9 employees, 19% with 10-99 employees and 2% with 100-199 employees.

**Profile of the entrepreneurs.** Most of the manufacturing entrepreneurs in SOCSARGEN have age from 30-59 (81.55%), 8.41% in their twenties and 9.71% 60 years and older. There are 12% more women (56%) entrepreneurs than men (44%) entrepreneurs. Owner/managers who took college (70.87%) education outnumbered those with secondary (23.3%), masteral (3.88%), doctoral (1.29%) and elementary (0.66%) education. Among the 309 respondents, only 34% attended government-sponsored training. For non-government trainings, 68% of the respondents have attended trainings conducted by institutions other than government agencies. More than half of the respondents (52%) have business experience within the company for 5 years and below, 27% for 6-10 years, 11% for 11-15 years, 6% for 16-20 years and 4% for more than 20 years. For business experience outside the company, 78% have no business experience, 11% for 5 years and below, 7% for 6-10 years, 3% for 11-15 years, 1% for 16-20 years and less than 1% for more than 20 years. The owners predominantly manage their businesses (83%).

**Entrepreneurial Characteristics, Enterprise Characteristics, Networks and Business Environment.** All the indicators of the Entrepreneurial Characteristics: growth aspiration, opportunities seeking, innovativeness, risk taking and education, training and experience have strong level of influence on sustainability. This finding agrees with the research done by Hampel-Milagrosa, Loewe and Reeg (2015). The likelihood for MSMEs to upgrade is attributed mainly to entrepreneur characteristics.

In the Enterprise Characteristics factor, the strongest indicator was the Customer Satisfaction. The respondents rated this indicator as the most important as this enterprise characteristic indicator provided the revenues to keep the business operating. Included in the top indicators were Employees' Skills Development and Financial Management. The last two indicators were R&D and advanced technology. In as much as the majority of the respondents are single proprietors and whose value of assets are P3,000,000 or less, these manufacturing MSMEs struggled in their investments in research and development and advanced technology due to limited resources.

In Networks, the result suggests that manufacturing MSMEs in SOCSARGEN enjoy good relationship with suppliers and service providers, family and friends and competitors. The difficulty in obtaining the much needed cash from banks could be remedied by suppliers extending credit to MSMEs for the raw materials to be used in production. Family and friends could also be another provider of financing for the MSMEs' operating expenses and equipment acquisitions. Active participation in trade organizations and linkages with universities and educational institutions were the least indicators in Networks.

The findings on Business Environment factor corroborated with the data of DTI on MSMEs. The data gathered in this study served as an empirical evidence about the business environment affecting manufacturing MSMEs in SOCSARGEN. According to DTI the issues facing the MSMEs include low competitiveness, productivity and structural limitations, limited access to fund sources and access to markets. The government support (3.79) indicator was rated the lowest in the Business Environment. This result, however, does not justify the conscientious efforts of the government to create a better business environment in SOCSARGEN. The Republic Act

10644 known as "Go Negosyo Act" was created to promote job generation and inclusive growth through the development of MSMEs in the country; establishment of "Negosyo Centers" in all provinces, cities and municipalities to promote ease of doing business and facilitate access to services for MSMEs within its jurisdiction; technology transfer, production and management training, as well as marketing assistance for MSMEs. The Negosyo Center in General Santos City offers business advisory, business registration assistance and business information and advocacy. In business advisory the Negosyo Center provide MSMEs advisory services tailored according to their needs through one-on-one consultation, focus group discussion and coaching/mentoring such as promote efficient marketing of local products and services thru market matching, trade fairs and exhibits participation; assist in packaging loans and links MSMEs to appropriate financing institutions; provide counselling for the development and improvement of products and packages; match local proponents with potential investors; facilitate processing and documentation of paper requirements necessary for the establishment of MSMEs and conduct trainings, seminars and dialogues to increase MSMEs productivity and efficiency (Negosyo Center, 2018). In the local government unit (LGU) of General Santos City, the City Economic Management and Cooperative Development Office (CEMCO) conducts skills and entrepreneurial training to MSMEs. The access to finance indicator was rated second to the lowest among the business environment indicators with a mean of 3.80. There are many banks operating in SOCSARGEN, however, the manufacturing MSMEs are unable to access loans from these funding sources because of three main constraints. According to DTI, MSMEs lack information on where and how to access such services; have the fear of not being able to meet loan obligations and have no collateral to cover the loan. Access to market (4.04) is the third indicator that was rated low. Inadequate knowledge of market opportunities and how to penetrate bigger markets have constrained manufacturing MSMEs to limit their sales locally and more specifically to final consumers and not able to expand into the national and foreign markets. Constrained with limited resources, a number of manufacturing MSMEs in SOCSARGEN use outdated methods in producing their products resulting to high level of wastage and heightened competition. Pertaining to raw materials availability, SOCSARGEN is the major producer of pineapple, corn, papaya, abaca and cassava in the region and General Santos City the tuna capital of the Philippines. On low incidence of natural calamities, typhoon had never threatened SOCSARGEN.

**Multiple Regression Analysis.** Multiple regression analysis was applied to test the explanatory and predictive power of the different independent variables, namely: Entrepreneurial Characteristics, Enterprise Characteristics, Networks, and Business Environment to the dependent variable Sustainability. Using stepwise method, the following tests were performed first to see whether the MRA assumptions on normality, collinearity, homoscedasticity, and sufficiency of observations were met: Kolmogorov-Smirnov and Shapiro-Wilk tests, Normal P-P plot, Scatterplot, VIF, and the parameters estimated multiplied by a factor of 10. Then the results of multiple regression (model summary, ANOVA, coefficients, and moderating output) were analysed for the model fit, the explanatory or predictive power, and the moderating effect.

The standardized residual was applied in Kolmogorov-Smirnov and Shapiro Wilk tests to determine if the assumption of normality has been met. The tests (refer to Table II) indicated

that there is normality issue on the data used in this study. According to Hair, Babin and Anderson (2014) normality can have serious effects in small samples (fewer than 50 cases), but the impact effectively diminishes when sample sizes reach 200 cases or more. The data did not have any collinearity or homoscedasticity issues. As far as the assumption of observation sufficiency is concerned, the 6 parameters estimated was sufficient enough as there were 309 respondents (See Table II).

During the initial run of MRA Stepwise, the result showed there were 4 outliers. Upon removal of the outliers, the R<sup>2</sup> has improved from .557 to .589.

Based on the MRA model, the ANOVA was significant (p-value .000); thus, the independent variables applied in this study relate well with the dependent variable. The MRA model also showed an R<sup>2</sup> of .589, therefore, the model can moderately explain 58.9% of the data variability.

The coefficients further showed the R<sup>2</sup> was specifically explained by Enterprise Characteristics (beta .371, t-value 7.818, p-value .000), followed by Business Environment (beta .278, t-value 7.349, p-value .000) and Entrepreneurial Characteristics (beta .166, t-value 3.528, p-value .000), respectively.

**Table 2**  
Summary of MRA Assumption Test Results

Normality tests	
Kolmogorov-Smirnov	Sig. .022 (the null hypothesis – no significant normality concern – was rejected)
Shapiro-Wilk	Sig. .037 (the null hypothesis – no significant normality concern – was rejected)
Normal P-P plot	There was no close fit between the data and the linear line (45°)
Collinearity test	No VIF values greater than 4 (highest VIF is 2.075)
Homoscedasticity test	Scatterplot did not show any presence of a diamond or triangle shaped pattern.
Sufficiency of Observation: 6 parameters x 10 (or 60) with 309 respondents.	Sufficient

**Table 3**  
Summary of MRA Stepwise Method Results

	coefficient	t-value	p-value	R <sup>2</sup>	ANOVA
DV – Sustainability			.424	.589	F value 144.499 (sig. .000)
Constant	.812	4.725	.000		
IV – Enterprise Characteristics	.371	7.818	.000		
IV – Business Environment	.278	7.349	.000		
IV – Entrepreneurial Characteristics	.166	3.528	.000		

**Moderation Analysis.** For the hierarchical moderation analysis, the Process software by Prof. Hayes was applied. The result showed that Firm Age did not moderate the effect of the independent variables (enterprise characteristics, business environment, and entrepreneurial characteristics) to the dependent variable (sustainability) based on a p-value of .9957. This was manifested also through the no interaction effect of firm age with the independent variables: enterprise characteristics (p-value .4577), business environment (p-value .3869), and entrepreneurial characteristics (p-value .8125). Thus, the null hypothesis [firm age does not moderate the effect of the independent variables (enterprise characteristics, business environment, and entrepreneurial characteristics) to the dependent variable (sustainability)] was accepted.

**Validation.** The main MRA result was validated using split samples method to test its generalizability. The result showed the main MRA is similar to Split Sample 2; thus, the result can be generalized across the population (see Table 4).

**Table 4**  
Validation of Main MRA with Split Sample 2 MRA

Independent Variable (IV)	Main MRA	Split_Sample 1 MRA (holdout)	Split_Sample 2 MRA
	R <sup>2</sup> .589	R <sup>2</sup> .602	R <sup>2</sup> .606
	Adjusted R <sup>2</sup> .585	Adjusted R <sup>2</sup> .611	Adjusted R <sup>2</sup> .594
	Standard error of estimate .3299	Standard error of estimate .3203	Standard error of estimate .3462
Enterprise Characteristics	significant	significant	significant
Business Environment	significant	significant	significant
Entrepreneurial Characteristics	significant	significant	significant
Networks	not significant	not significant	not significant

**IV. CONCLUSIONS**

Based on the data gathered and analyzed for this research, the significant factors/variables that influenced sustainability for the manufacturing firms in SOCSARGEN are Enterprise Characteristics, Business Environment, and Entrepreneurial Characteristics. Thus, the triple bottom line of sustainability (people, profit, planet) are influenced moderately by the said factors. Moreover, the findings should guide the entrepreneurs in their pursuit of sustainability, the government agencies mandated to assist MSMEs in their intervention decisions and policy formulation and the academe in their role of providing education on these important drivers of the economy.

**V. RECOMMENDATIONS**

The study recommended that MSMEs should be made aware of the important qualities of the entrepreneurs like growth aspiration, opportunity seeking, innovativeness, education, training, experience and risk taking. They should also develop their employees' skill on understanding customer satisfaction through research, acquiring financial literacy, and updating on advance technology. The academe and researchers are encouraged to explore more on the other factors that influence sustainability.

**ABOUT THE RESEARCHER**

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