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Performance of small and medium-sized food and agribusiness enterprises: evidence from Indian firms

RESEARCH ARTICLE

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Abstract

This paper analyses the size of food and agribusiness firms in India in relationship to business enterprise characteristics, performance, and obstacles through surveying 515 food and agribusiness firms operating in different regions of India using the World Bank's Enterprise Survey 2014. Descriptive statistics, chi-square tests and analysis of variance were used to evaluate data using statistical software. Chi-square statistics identify significant differences in enterprise characteristics through examining firm size, location, gender ownership, type and age. An analysis of variance indicates significant differences in business performance across small, medium and large enterprises in term of input and output ratios. Obstacles facing firms are largely similar regardless of firm size in eleven of the sixteen business-obstacles surveyed. Results reveal that large enterprises perceive more challenges with telecommunication services, customs, trade regulations, and corruption, while small and medium firms face greater constraints gaining access to land and finance. This study is useful in helping to design policies that can efficiently support small and medium food and agribusiness enterprise development.

Keywords: firm size, small and medium enterprises, business performance, business obstacles, enterprise survey
JEL code: C83, D22, L25, L66

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1. Introduction

Small and medium-sized food and agribusiness enterprises (SMEs) play a major role in global economic growth and development, particularly in the developing economies (Ayyagari *et al.,* 2007; Berry *et al.,* 2001; Cook, 2001; De and Nagaraj, 2014). The Indian food processing industry is widely recognized as having the potential to transform the Indian economy through large-scale food manufacturing that will not only benefit consumers in the long run but provide future employment and export earning opportunities. The output and employment contributions from these sectors are continuously increasing across regions (Mead and Liedholm, 1998) as demand for high processed foods rises due to urbanization, an expanding middle class, growing health awareness and evolving consumer preferences. The food and agribusiness sector is comprised of a large number of small and medium enterprises, a few large enterprises and multinationals, all competing with each other at every level of the supply chain. A competitive food and agribusiness sector requires effective innovation and entrepreneurship development in order to compete and strengthen growth (ACI and ETG, 2011).

Indian food processing segment produces a broad spectrum of products including fruits, vegetables, legumes, spices, meats, poultry, and fisheries, milk and dairy products, alcoholic beverages, grain processing and specialty products such as confectionaries, cocoa products, soya-based and high protein foods, and mineral water, etc. It is estimated that the Indian agribusiness industry generated around $245 billion in 2015 and has grown 5.7% annually from 1991-2015 (BMI, 2016). The Ministry of Micro, Small and Medium Enterprises estimates about 51.06 million of micro-small-medium enterprises, employ about 117.2 million people. The food and agribusiness industry comprises about 6.9% of this sector employing 7.8%. The importance of business development, among small and medium enterprises, is widely recognized across developing and developed nations (Forsman and Temel, 2011; Tanabe and Watanabe, 2005). Dethier *et al.* (2011) found through an extensive survey of literature that good business practices tend to favor growth by encouraging productivity, further detecting that various infrastructures, finance, security, competition, and regulatory factors all significantly impact enterprise performance.

De and Nagaraj (2014) argued that large-scale firms in the Indian manufacturing sector face different opportunities and challenges from small-scale firms. Although small firms managers are more flexible in their ability to respond quickly to market changes, larger firms have advantages of the economies of scale giving them more political clout and better access to government credits, contracts, and licenses. Considering the differences in managerial issues of firms by size, the government has provisioned separate regulatory and developmental arrangements. Moreover, development of micro, small and medium-sized enterprises (MSMEs) are important factors in employment, innovation, economic growth, and equity, so consequently are given policy thrusts in most developing countries. In India, the Micro, Small and Medium Enterprises Development Act 2006 subsequently merged into the Ministry of Small Scale Industries and the Ministry of Agro and Rural Industries in May 2007 to form the Ministry of Micro, Small and Medium Enterprises to better address policy issues affecting MSMEs. Understanding perceived business obstacles, enterprise characteristics and business performance from a scale perspective helps agribusiness managers align with the needs of the supply chain and policy makers in order to design better policy support.

2. Conceptual framework and research hypotheses

Empirical evidence shows that firm size affects business performance and decision-making (Chang *et al.,* 2013; Kalkan *et al.,* 2011; Lee, 2009; Lun and Quaddus, 2011; Palmon and Wald, 2002; Vithessonthi and Tongurai, 2015; Youn *et al.,* 2015). While some studies find business performance varies across firm size, others found mixed or no relationship between firm size and business performance (Bourlakis *et al.,* 2014; Orlitzky, 2001). Beck *et al.* (2005), argue that firm size impacts a firm's productivity, survival, and profitability. Bourlakis *et al.* (2014) analyzed sustainable performance differences within the Greek food supply chain by making statistical comparisons (of growers, manufacturers, wholesalers, and retailers) related to firm size. Kotey (2005) examined firm size and business performance in relation to profits, growth, efficiency and

liquidity differences between family and non-family, small-to-medium-sized enterprises (SMEs). Orlitzky (2001) analyzed relationships across firm size, corporate social performance and firm financial performance, concluding there is neither a significant positive correction between firm size and corporate social performance nor between firm size and firm financial performance.

According to the literature, most large firms occupying dominant business positions have the advantage of economies of scale and efficiency. Laing and Weir (1999) noted that larger firms normally follow better governance structures and business compliance in achieving high-level corporate performance. Analyzing the legal-economic framework in Mexico, Laeven, and Woodruff (2007), showed that the legal system affects firm size by reducing the idiosyncratic risk faced by firm owners. Examining the linkage between firm size and technological changes, Antonelli and Scellato (2015) conclude that large firms are more likely to introduce science-based technological changes consisting of a shift effect in production functions, whereas smaller firms rely more on tacit, external knowledge involving technologies that use more locally abundant production factors. Researchers exploring the relationship between technical efficiency and firm size find that larger firms experience higher technical efficiency compared to smaller firms (Antonelli *et al.,* 2015; Chow *et al.,* 1997; De and Nagaraj, 2014).

This paper analyses the size of food and agribusiness firms in India in relationship to business enterprise characteristics, performance, and obstacles. Nichter and Goldmark (2009) highlighted the following four types of factors affecting the growth and performance of business enterprises: (1) individual entrepreneur characteristics; (2) firm characteristics; (3) relational factors such as social networks or value chains; and (4) contextual factors such as the business obstacles. The following three hypotheses are formulated and tested in the study (Figure 1):

H_1: there are no differences in profiles among food and agribusiness enterprises across small, medium and large size firms.

Several empirical studies have highlighted the importance of enterprise profile variables such as size, age, nature of ownership and location in understanding the performance of the firms (Coad and Tamvada, 2012; Shanmugam and Bhaduri, 2002). The location of firms is influenced by a variety of factors such as taxation, access to raw materials and availability of markets (Hebous *et al.,* 2011; Sridhar and Wan, 2010). Sridhar and Wan (2010) found that large firms in India are normally concentrated in smaller cities, which is a surprise as larger cities have better provisions, infrastructure, and other public services. The evidence clearly indicates that the size of firms is an important implication in firm ownership and management by gender (Bardasi *et al.,* 2011; Coleman, 2007). Ensuring gender diversity on corporate boards has become a mandatory provision under the New Companies Act of 2013 to improve corporate governance (Shrivastava and Chakraborty, 2015). Since 2013, the Securities and Exchange Board of India is implementing gender diversity in boardrooms. Shanmugam and Bhaduri (2002) analyzed that age positively influences growth across Indian manufacturing sector. Although, Park *et al.* (2010) found that firm size and age negatively impacted firm growth while positively impacting firm survival in the Korean manufacturing industry.

H_2: there are no differences in business performance among food and agribusiness enterprises across small, medium and large size firms.

Empirical evidence finds some indicators were used to analyze business performance across firm size (Bourlakis *et al.,* 2014; Campos-Climent and Sanchis-Palacio, 2015; Lee, 2009; Orlitzky, 2001). Chen (2009) argued that enterprise competitiveness is derived from the performance of its business units in the form of input-output relationships. Ponikvar *et al.* (2009) investigated the impact of firms' growth rate based on various financial and non-financial performance ratios such as revenue per employee, average costs, labor costs, capital costs, capacity utilization, productivity, and efficiency.

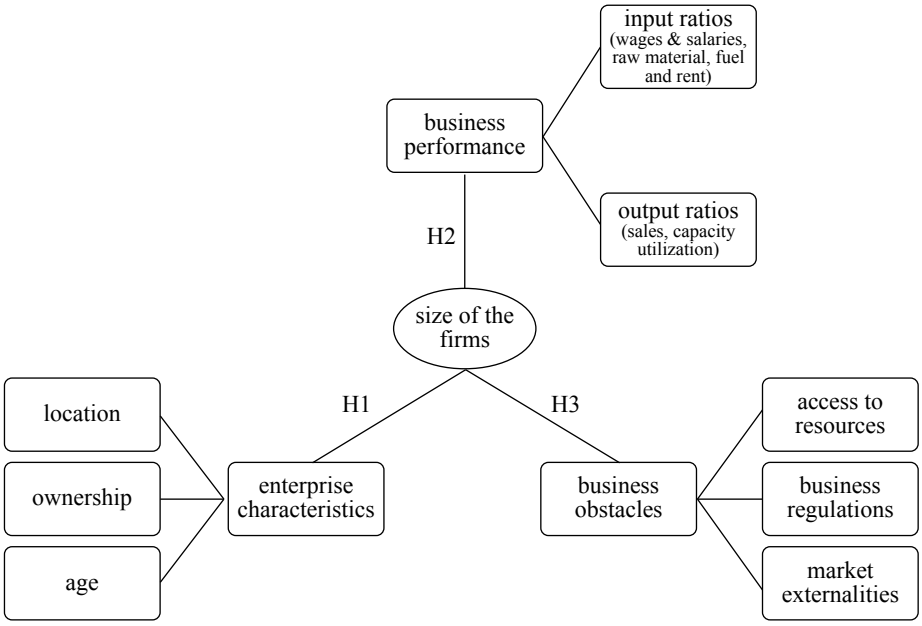

Figure 1. Conceptual research framework and hypothesis testing.

H_3: there are no differences in business obstacles among food and agribusiness enterprises across small, medium and large size firms.

Although De and Nagaraj (2014) assert that problems and challenges faced by small, medium and large firms vary greatly, several studies find that small firms face larger growth constraints and have less access to formal sources of finance (Beck *et al.,* 2006; Hutchinson and Xavier, 2006; Kumar and Rao, 2016; Ramukumba, 2014). A variety of factors hinder business performance broadly categorized as access to resources, business regulations and market externalities (Das and Das, 2014).

3. Data and methods

Data source

This study uses primary data taken using a stratified random sampling of 515 Indian food and agribusiness firms operating in different regions of India, conducted under the World Bank's Enterprise Survey in 2014. The strata for Enterprise Surveys are based on firm size, business sector, and geographic regions within a country. This study is a part of a comprehensive survey of 9,281 firms of different industry sub-sectors across the country. Firm size has been categorized based on the number of employees i.e. 5-19 employees as a small enterprise; 20-99 employees as a medium enterprise; and 100 and above employees as a large-sized enterprise.

The survey contained information on a variety of firm's characteristics such as ownership, type of firms, size, location, and age; performance indicators regarding input and output ratios; and information on business obstacles as reported by the firms on a 5-points rating scale: 1 = no obstacle; 2 = minor obstacle; 3 = moderate obstacle; 4 = major obstacle; 5 = very severe obstacle. Obstacle indicators surveyed included: electricity, telecommunications, transport, customs and trade regulations, practices of competitors in the informal sector (such as unfair competition), access to land, crime, theft and disorder, access to finance, tax rates, business licensing and permits, corruption, labor regulations, and inadequately educated workforce.

To measure the performance of business enterprises across sizes, a number of input and output ratios are used. Input ratios were generated for categories including wages and salary per employees, cost of raw material

by the total cost of production, cost of fuel by the total cost of production, cost of electricity by the total cost of production and rent for land and machinery by the total cost of production. Similarly, output ratios were generated to understand the business performance of firms in terms of total annual sales by the total cost of production and capacity utilization ratio of the firms. Further, business obstacles have been categorized into access to resources, regulatory system, and business externalities.

Data analysis

The World Bank's Enterprise Survey data on food enterprises was analyzed using Statistical Package for the Social Sciences version 20.0 (SPSS, IBM, Chicago, IL, US). Simple statistical tools such as descriptive statistics, cross-tabulation, chi-square test and analysis of variance have been used to understand the business performance differences across size of food and agribusiness firms in India.

The difference in enterprise characteristics across firm size was analyzed using the chi-square test statistics as follows:

$$\chi^2 = \sum(O - E)^2 / E$$

With df = (r-1) (c-1), where r and c are the number of possible values for the two variables under consideration.

Similarly, differences in business performance examining input-output ratios and business obstacles regarding access to resources, business regulations and market externalities across small, medium and large enterprises were analyzed using the analysis of variance technique.

4. Results and discussion

Enterprise characteristics by size

Several studies investigating differences in enterprise characteristics by firm size have shown various relationships with enterprise characteristics regarding location, ownership, type and age (Cerdan and Hernández, 2013; De and Nagaraj, 2014; Orser *et al.,* 2000; Vithessonthi and Tongurai, 2015). Of the 515 food and agribusiness enterprises surveyed under the World Bank's Enterprise Survey, about 52% were small, 30% were medium, and 18% were large firms. Table 1 provides details by firm size, location, type, and age. The results of chi-square statistics clearly indicate that firm characteristics vary significantly by size and substantial differences by size exist across various regions of the country (χ^2=58,324, P<0.01). More food and agribusiness SMEs are located in the southern regions, whereas the northern and eastern regions have more large firms. Similarly, small and medium enterprises are primarily located in bigger cities (χ^2=17.255, P<0.01).

Most of the firms surveyed were small and medium enterprises, and female ownership was comparatively higher in larger firms (χ^2=8.585, P<0.05). The result of the chi-square test for female participation in the management of firms reveals significant differences across the size of enterprises (χ^2=9,907, P<0.01). Out of the 515 firms surveyed under the World Bank's Enterprise Survey, about 7% were managed by a top female manager and about 16.5% firms reported having at least one female owner. It is important to note that among the female owners, about 8% reported having 100% ownership of the enterprises, while 26% reported ownership up to 50% and above of the firm's resources. Distribution of firms by type of ownership also vary with the size of enterprises (χ^2=42.002, P<0.01). Most of the small and medium enterprises are mainly sole proprietary/partnership firms whereas large enterprises utilize limited company/partnership. The distribution of enterprises by age across the size of firms also varies significantly (χ^2=16.310, P<0.05). It is evident that the number of small and medium firms decline with the age of the firms whereas large firms are comparatively older in age.

Table 1. Enterprise characteristics by size.

Indicators	Small enterprise n=268		Medium enterprise n=154		Large enterprise n=93		Chi-square[1]	df	*P*
	n	%	n	%	n	%			
Regions							58.324**	10	0.000
Central	26	9.7	7	4.5	11	11.8			
Eastern	60	22.4	20	13.0	25	26.9			
Northeastern	31	11.6	27	17.5	14	15.1			
Northern	40	14.9	37	24.0	28	30.1			
Southern	70	26.1	59	38.3	12	12.9			
Western	41	15.3	4	2.6	3	3.2			
Size of locality							17.255**	6	0.008
City with population over 1 million	96	35.8	32	20.8	26	28.0			
Over 250,000 to 1 million	73	27.2	44	28.6	25	26.9			
50,000 to 250,000	67	25.0	41	26.6	28	30.1			
Less than 50,000	32	11.9	37	24.0	14	15.1			
Female participation in ownership							8.585*	2	0.014
Yes	32	11.9	32	20.8	21	22.6			
No	236	88.1	122	79.2	72	77.4			
Firms with a female top manager							9.907**	2	0.007
Yes	16	6.0	6	3.9	13	14.0			
No	252	94.0	148	96.1	80	86.0			
Type of firm							42.002**	6	0.000
Limited company	13	4.9	11	7.1	21	22.6			
Sole proprietorship	153	57.1	69	44.8	26	28.0			
Partnership	98	36.6	70	45.5	43	46.2			
Others	4	1.5	4	2.6	3	3.2			
Age of the Firm							16.310*	6	0.012
<10 years	57	21.3	36	23.4	26	28.0			
10-20 years	119	44.6	60	39.0	21	22.6			
21-30 years	52	19.5	28	18.2	21	22.6			
>30 years	39	14.6	30	19.5	25	26.9			

[1] **significant at 0.01 level, *significant at 0.05 level.

Therefore, hypothesis H_1, which assumes that there is no difference in enterprise characteristics of firms by size, is not accepted, and small, medium and large firms significantly vary in enterprise characteristic parameters. In a nutshell, small and medium food and agribusiness firms comparatively belong to the southern region and are primarily concentrated in larger cities as compared to large firms, which operate in northern and eastern regions. It is interesting to note that SMEs preferably locate themselves in areas with proper infrastructural availability and within close proximity to markets. Female participation in ownership and management of food and agribusiness enterprises also increases with firm size. Similarly, most small and medium enterprises are sole proprietary/partnerships whereas as large enterprises are limited company/ partnerships. The age of the firm is positively correlated with the size.

Difference in business performance by size of enterprises

The cost of production and output varies with firm size. Business performance is analyzed using a variety of indicators such as inputs and outputs (Watson, 2002); profit margins and employment (Chirwa, 2008); closure rates, return on assets, risk (Robb and Watson, 2012) and the impact of return on assets on business

growth and survival (Basyith *et al.,* 2014). Table 2 shows the differences in input and output performances across enterprise size. Analysis of Variance (ANOVA) was used to examine variances among the performance indicators. Large enterprises pay higher per unit costs (of producing goods and services) than small and medium enterprises in wages and salaries per employee (F=3.751, $P<0.05$); and rent by total cost of production (F=3.834, $P<0.05$). However, raw materials are comparatively less in bigger enterprises than small and medium agribusiness firms (F=3.751, $P<0.05$).

Output is a key indicator to measure performance in terms of annual sales turnover and capacity utilization of firms. The analysis shows that annual sales by per unit cost of production in large firms are higher than small and medium agribusiness firms, which is statistically non-significant (F=10.017, $P>0.10$). However, capacity utilization across firm size is high for large firms compared to small and medium sized firms and is statistically significant at 0.10 (F=2.545, $P<0.10$). Therefore, Hypothesis H_2, which assumes that there is no difference in business performance across small, medium and large enterprises, is not accepted, and large firms significantly vary on business performance parameters such as wages and salaries, raw material costs, rent and capacity utilization. It is clear from the analysis that large firms pay comparatively higher wages and salaries compared to SMEs as large firms are subjected to comply with more stringent labor regulations. However, SMEs spend more on raw materials due to low economies of scale in handling raw material for processing.

Business obstacles by size of firms

In a rapidly changing business environment, several factors hinder business performance (Kwong *et al.,* 2012; Mbonyane and Ladzani, 2011; Roomi *et al.,* 2009; Watson, 2006). Beck *et al.* (2005) explored the implications of financial, legal, and corruption obstacles affecting firms of different sizes. Formal government legislation, policies, and programs play a vital role in facilitating the growth and development of business enterprises (Aidis, 2005; Roxas *et al.,* 2013). In this study, sixteen parameters were used to examine access to resources, regulatory, and business externalities of firms using a 5-points rating scale: 1 = no obstacle, 2 = minor obstacle, 3 = moderate obstacle, 4 = major obstacle, 5 = very severe obstacle. Table 3 provides the analysis of different business obstacles across firm size.

Table 3 shows that a firm's response to operational challenges varies greatly by firm size for five out of the sixteen indicators. However, a low mean value of responses concerning business obstacles suggests

Table 2. Difference in business performance by size of firms.

Business performance indicators	Small enterprise n=268	Medium enterprise n=154	Large enterprise n=93	F[1]	df	Sig.
Input ratios						
Wages and salaries (Rs. in lakhs)/number of employees	1.11	1.15	1.57	3.751*	2	0.024
Cost of raw material/total cost	0.71	0.75	0.66	3.152*	2	0.044
Cost of fuel/total cost	0.03	0.03	0.03	0.078	2	0.952
Cost of electricity/total cost	0.06	0.06	0.05	0.530	2	0.589
Rent for land and machinery/total cost	0.02	0.02	0.04	3.834*	2	0.022
Output ratios						
Total annual sales/total cost	1.72	1.83	2.23	1.051	2	0.350
Capacity utilization (%)[2]	78.8	77.3	82.3	2.545	2	0.079

[1] * significant at 0.05 level.

[2] The capacity utilization under the World Bank's Enterprise Survey is defined in terms of output produced as a proportion of the maximum output possible if using all the resources available.

Table 3. Responses on business obstacles by size of firms.

Business obstacles	Small enterprise n=268	Medium enterprise n=154	Large enterprise n=93	F[1]	df	Sig.
Access to resources						
Electricity	2.7	2.9	2.9	1.475	2	0.230
Telecommunications	1.3	1.2	1.5	7.617**	2	0.001
Transport services	2.1	2.1	2.2	0.156	2	0.856
Access to land	1.9	1.5	1.8	5.095**	2	0.006
Access to finance	2.2	1.9	2.0	6.149**	2	0.002
Business regulations						
Customs and trade regulations	1.7	1.6	2.1	7.547**	2	0.001
Tax rates	2.6	2.6	2.6	0.080	2	0.923
Tax administrations	2.3	2.2	2.5	2.139	2	0.119
Business licensing and permits	2.1	2.0	2.0	0.133	2	0.876
Labor regulations	2.1	2.1	2.1	0.090	2	0.914
Market externalities						
Crime, theft and disorder	1.5	1.4	1.6	1.802	2	0.166
Courts	1.7	1.7	1.8	0.274	2	0.760
Practices of competitors	1.9	1.9	1.8	0.847	2	0.429
Political instability	2.0	2.0	1.9	0.493	2	0.611
Corruption	2.8	2.7	3.1	4.044*	2	0.018
Inadequately educated workforce	2.1	2.0	2.0	0.342	2	0.711

[1] **significant at 0.01 level, *significant at 0.05 level.

that firms are mainly facing minor or moderate levels of challenges in their business operations. Among the most significant differences in mean values are large enterprises who perceive comparatively more obstacles than small and medium enterprises for three indicators: telecommunication (F=7.617, $P<0.01$), customs and trade regulations (F=7.547, $P<0.01$) and corruption (F=4.044, $P<0.01$). This implies that large firms expect improvements in information provisions and communication technologies in order to meet business obligations and compliance with higher tax regulations. Lee *et al.* (2010) analyzed the incidences of bribery and the size of bribes using the residual control theory and argues that firms pay bribes based on their exposure and vulnerability to residual rights of control by government officials. Similarly, small enterprises perceive comparatively more obstacles than large enterprises for two business obstacles – access to land (F=5.095, $P<0.05$) and finance (F=6.149, $P<0.01$). This clearly indicates that SMEs face challenges in accessing the land and credit for business expansion. Therefore, Hypothesis H_3, which assumes that there is no difference in business obstacles across firm size, is largely accepted, as small, medium and large firms perceive similarly on the majority of business obstacles parameters.

5. Conclusions and managerial implications

Small and medium enterprises play a crucial role in the growth and development of the economy through generating employment opportunities, reducing regional imbalances, industrialization of rural and backward areas and assuring equitable distribution of resources. The problems and opportunities are different for small, medium versus large enterprises. While small firms have more flexible management and lower response time to market changes, larger firms have the advantages of economies of scale, political clout and better access to government credits, contracts and licenses (De and Nagaraj, 2014). Therefore, there is a need to analyze the nature and magnitude of business performance and obstacles faced by firms across the size of enterprises. The Indian government has adopted a focused approach in developing and promoting MSMEs and large enterprises separately by dedicated central ministries, policies, and plans.

By acknowledging the differences in managerial needs by firm size, governments are making separate regulatory and developmental provisions to address the issues. As the majority of business enterprises are micro, small and medium, this sector is given a policy thrust in most developing countries. In India, the Ministry of Micro, Small, and Medium Enterprises addresses policy issues affecting MSMEs.

This paper analyzed the differences in business performance and obstacles faced by food and agribusiness firms in India. This analysis reveals that business needs vary depending on size. Small and medium food and agribusiness firms were located primarily in the southern region of the country and concentrated in larger cities, while larger firms normally operate in the northern and eastern regions. Female participation in ownership and management of food and agribusiness enterprises increases with firm size. Similarly, most small and medium enterprises are sole proprietary/partnership firms whereas large enterprises are limited company/partnership firms. The age of the firm was positively correlated with the size.

This study provides some insight into the differences in firm performance and business obstacles across the small, medium and large enterprise and can serve as a resource in helping researchers, bankers, entrepreneurs, and policymakers develop effective business models which address the greatest challenges faced by small and medium food and agribusiness enterprises. The study is based on a larger survey of data from the World Bank. The secondary data has provided limited choices in selecting the performance indicators of business enterprises as well as business obstacles encountered by these enterprises. Future research can be conceptualized based on theoretical models with suitable indicators by incorporating in-depth interviews of respondents and their characteristic variables.

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