



## THE MODERATING ROLE OF GOVERNMENT SUPPORT ON FOOD PROCESSING SME'S INTERNAL FACTORS AND THE IMPACT TO EXPORT PERFORMANCE



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### ABSTRACT

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#### Keywords

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This research addresses a theoretical framework to describe the relationship between firm characteristics, management characteristics, labour productivity, innovation and moderating effect of government support on food processing SMEs' export performance. The new conceptual framework helps firms to determine the factors that contribute to the success in export performance and the effectiveness of government support. The research is focusing on food processing firms because the food processing industry is considered one of the most value-added businesses in the Malaysian economy. The results indicated that food processing firms' export performance is positively related to firm characteristics, management characteristics, labour productivity, and innovation. Government support is an important element to strengthen food processing SMEs' export performance, the moderating effect from government support, shown a significant positive relationship between management characteristics and labour productivity towards export performance, but the lesser moderating effect is shown towards firm characteristics and innovation. The government support has created a platform and rich resources to expand firm networking, management skills, and labour skills. Continue effort required for improving firms' firm characteristics and innovation.

**Contribution/ Originality:** The study is one of very few studies which have investigated Malaysian food processing SMEs internal factor in the international market and creating benchmark to improve their quality and competence. In practical perspective this study will help the management of food processing SMEs to improve their export performance.

### 1. INTRODUCTION

Malaysia is a country rich with natural resources and a tropical climate, which giving Malaysia a huge advantage for the growth of agricultural activities. Agri-products serve as a source for the food processing industry. According to past research and existing statistics, the food industry is one of the important socioeconomic in Malaysia whereby the food processing sector contributes a major portion among SMEs (Alam, Jani, Senik, & Domil, 2011). Processed food products are exported to more than 80 countries, with an annual export value of approximately US\$1.7 billion in the year 2010, contribute two-thirds of the total Malaysian food exports (Alam et

al., 2011). Agriculture development and food process technology able to serve as a long-term solution for food shortages (Texas A&M AgriLife Communications, 2014). In Malaysia, there are various of agriculture products, such as palm oil and fruits used to be the major export material. but the competitiveness of the global market is expanding which caused GDP contribution reduced. Despite that agriculture, still has the potential to bring more significant growth in the GDP (Texas A&M AgriLife Communications, 2014).

The Malaysian government has implemented the 21st-century villages, by improving the living standards of farmers and introducing new farming technology to attract more local entrepreneurs to invest in the agriculture sector (Economic Planning Unit, 2015). Implemented an effective policy able to bring out immense change for the agriculture sector (Tell et al., 2016) and continue to contribute to the growth of the food processing industry. (Muhammad & Nawaz, 2009) also found that SMEs might encounter various issues from internal and external factors, such as availability of tangible and intangible resources, organizational and managerial factors, that affect the growth and development of food processing SMEs. Another research from Sui and Baum (2014) found that firm size, productivity, management characteristics and innovations with the moderating effect of the internationalization strategy, will bring positive results for the survival in the export market.

### 1.1. Problem Statement

In the year 2010 to 2014, the agriculture sector is the third main contributor in terms of GDP. But from the year 2013 onwards, stagnation happens in agriculture with a low or zero percent of growth and giving impact towards food processing companies. Lack of advanced technology and high skill employees, exacerbate the problem in handling a healthy and effective supply chain (Alam et al., 2011; Texas A&M AgriLife Communications, 2014). Various barriers from internal and external factors, such as inconsistent supply, lack of financial and managerial resources will continue to limit the growth of food processing SMEs (Ahmed, 2012).

Food processing SME in Malaysia, still not achieving high achievement in export market, SMEs are often facing external challenges, such as stiff global competition and safety & quality requirement (Nor Ghani, Abul Bashar, Jamaliah, & Syed, 2016) competition from MNE or big companies increased the challenges when food processing SMEs moved to globalization. With existing problems present in food processing industry, food processing industry also facing internal challenges, such as cost, innovation & efficiency to improve in order to meet the quality and needs from export market (Kumar & Bala, 2013).

The better the performance of the food processing industry resulted in a better growth in agriculture. Export performance improvement can be determined by food processing SMEs' internal factors. Based on the above, the aim of this study is to identify the internal and moderating factor that influence on export performance of food processing SME in Malaysia. The study also aims to contribute to the growth of agriculture sector by improving food processing SMEs' export performance. At the same time, helps to understand the element of factors for food processing companies to survive in the global market.

## 2. LITERATURE REVIEW

In Malaysia, food processing SMEs are unlike large food industries which are well organised and adopted modern technology. The agricultural sector and food processing industry are striking for growth in the export market. Export performance is one of the indicators that reflect firm's performance toward the foreign market. Improvement in food processing SMEs' export performance not only able to show improvement in Malaysia economic status, in addition reflecting the market value and demand of Malaysia processed food products that produced by food processing SMEs (Aziz & Yassin, 2010). Malaysian food processing SMEs have been facing strong competitor orientation (Aziz & Yassin, 2010). SMEs that seek success or survival need to put extra effort in generating value-adding elements to superior customers (Ibeh, Ibrahim, & Panayides, 2006). This will help to encourage firms to create or design better products and services to meet the customers' needs. A firm's direction

and goal are supposed to be decided by the top management, and relevant research also found that management competencies or capabilities can influence the success of firms in all cases (Ibeh et al., 2006).

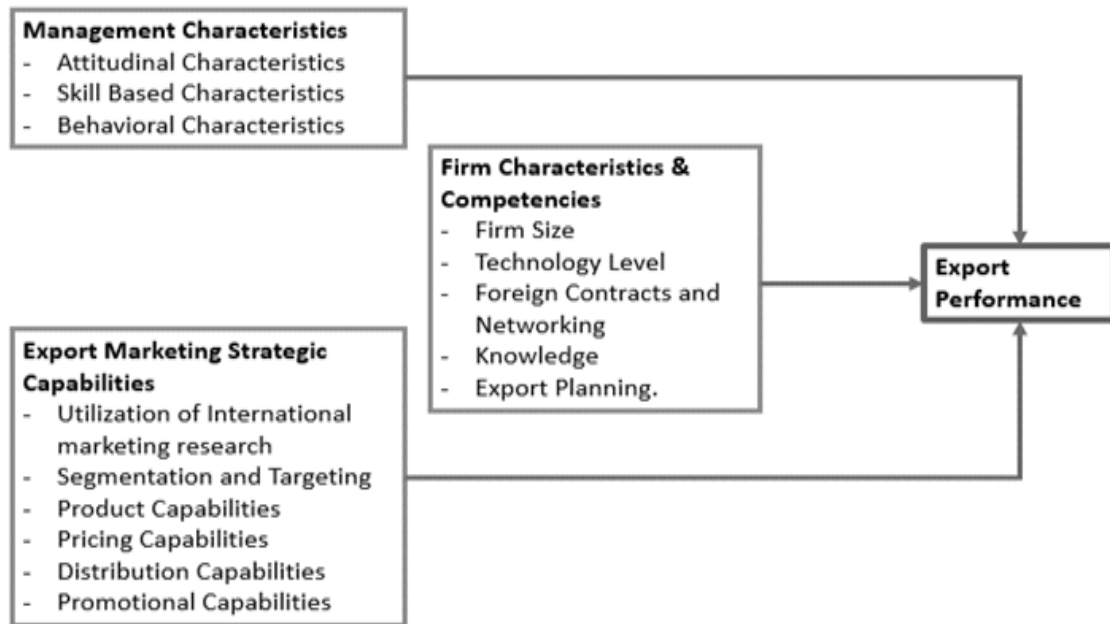


Figure-1. Management characteristics, firm's characteristics and export marketing strategic.

Source: Muhammad and Nawaz (2009).

Muhammad and Nawaz (2009) suggested management characteristics, firm's characteristics and export marketing strategic capabilities are impacting export performance. Figure 1 illustrates, export performance that has been defined related to firm's actions in export markets, under Muhammad & Nawaz research which conceptualized research completed by Leonidou, Katsikeas, and Samiee (2002) measurement which have identified that export sales growth, export profit level, export sales return on investment, sales volume as measures of export performance.

Management characteristics are a combination of a management ability, skill, knowledge and behaviour from the management team that create good company performance and expand business abroad (Del Río Araújo & Neira, 2006; Katsikea & Skarmeas, 2003). Past researchers shown managerial capabilities is always a key factor that determines the fate of a company. A great leader able to lead, build and develop, which bring out magnificent achievement to a company (Katsikea & Skarmeas, 2003). Management capacities can be defined as "having the appropriate personal characteristics and skills to deal with the right problems and opportunities in the right moment and in the right way" (Rougoor, Trip, Huirnc, & Renkema, 1998; Trip, Thijssen, Renkema, & Huirne, 2002).

Firm characteristics will be covering firm size, financial model, brand, type, strategy and more. The degree of measurement within different market sectors might be different across different industries (Radojević, Marjanović, & Radovanov, 2014). In Figure 2, a firm's size, length of the export experience, ownership capital and type of industry are categorised under a firm's characteristics. This can be a key measure that shows the level of competitiveness of a firm within the domestic and global market.

Food processing SMEs' export performance indicates company's profit and capability, similar to other SMEs' sectors (Aziz & Yassin, 2010). Firm size, productivity and innovations with the moderating effect of internationalization strategy will bring positive outcome on the survival in the export market. However, target population on Sui and Baum's study are Born Global SMEs (Sui & Baum, 2014). Nevertheless, the findings from the framework might not be fully applicable to apply in food processing SMEs in Malaysia. The framework below contribute the idea on factors that influenced export performance.



Figure-2. The Survival of SMEs in the Export Market.

Source: Sui and Baum (2014).

Productivity is a measurement of the efficiency of employee output. Labour productivity is also another measurement of the effectiveness of firm management. Labour performance of SMEs reflect the capabilities or capacity of the firm. Firm's labour productivity is considered high if firm able to fulfil demand from local and abroad Colpan (2012). Employees are considered as talent or asset of a company, and the productivity and performance of employees will actually lead the company towards a higher level of achievement (Coyle, 2009).

Innovation, in general, is important for all SMEs including food processing SMEs (Omidvar, 2006). Innovation can involve major or partial changes such as extensions to existing product lines (Cassiman & Martinez-Roz, 2007). In response to changing market conditions, SMEs need to adapt, develop new ideas, and improve existing products and business processes (Huergo & Jaumandreu, 2004).

### 2.1. Research Gap

Past literature highlighted factors that influence food processing industry's export performance for Malaysian contexts. Research on food processing SMEs' export performance within Malaysia context still not conclusive. It is important to examine whether the finding of the research could be generalized to Malaysian food processing SMEs setting, which differs in socio-culture context. Export performance is an important indicator that defines the SMEs performance and contribution to Malaysia economic.

Management characteristics believe to bring impact to organisation future, but the impact of management characteristics for food processing SMEs' export performance still not conclude by past research. Certain researchers found that management characteristics will not bring direct impact on export performance. But certain researchers believe management decision and vision are elements that determine the success of the firm export performance.

Firm characteristics are classified as one of the key factors influencing firm performance with the support of past journal. However, the relationship within for food processing SMEs' firm characteristic and export performance still not conclusive enough. Past research found that larger firm size enjoys higher export intensities and lower total costs (Schlegelmilch & Crook, 1988). But there are contradicting findings point out that firm size and start-up technology will not bring a huge impact to export performance, such as born global firm.

Government support is a key variable that helps improve firms' performance but also influences other factors. However, the role of government support as the moderator on food processing firms' export performance remains unclear. The moderator effect for export performance remains as a new concept that not conclusive, especially for food processing SMEs setting.

### 3. RESEARCH METHODOLOGY AND DESIGN

Methodologies and design of the research that applied in the research are discussed in this chapter. This chapter also adopted research framework to examine the empirical link between the export performance of Malaysian food processing SMEs based on a firm's characteristics, management characteristics, productivity, innovation and government support the unit of analysis in this study is the food processing SMEs.

The research focused on the relationship between a firm's characteristics, management characteristics, productivity, innovation, government support, and export performance of Malaysian SMEs. Thus, the research framework has been developed with the support of past researchers and journals, the relationship between dependent and independent variables are positively influenced. Introduction of a moderating variable can reinforce dependent and independent variables.

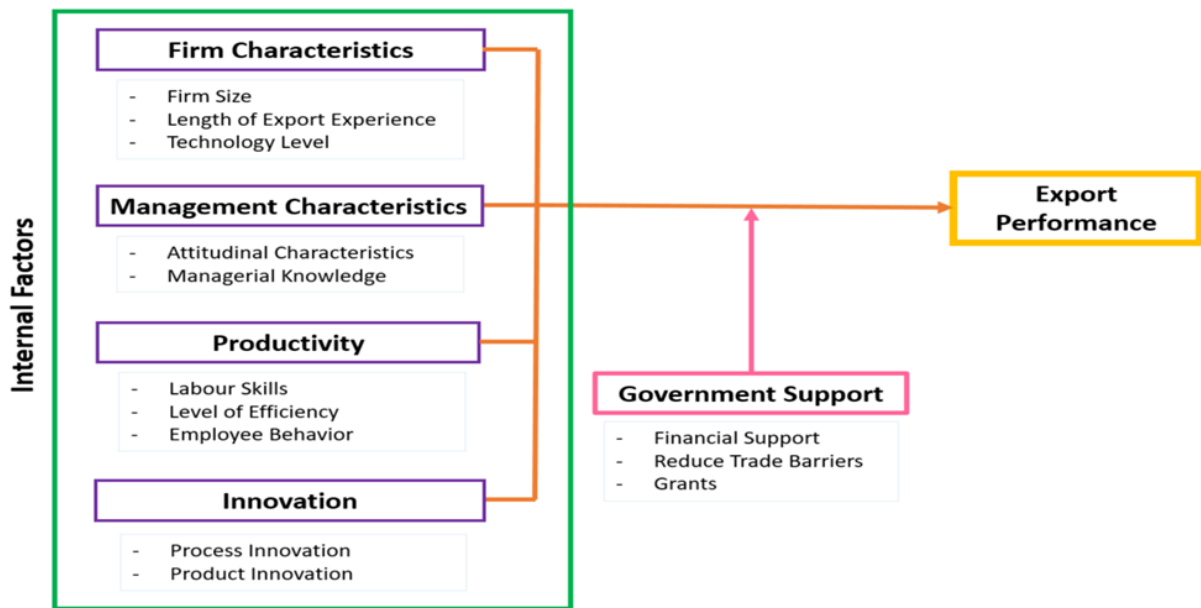


Figure-3. Conceptual framework of food Processing Industry's export performance factors.

Figure 3 illustrates, that a firm's characteristics is one of the independent variables and these variables contain three dimensions, which are a firm's size, length of export experience and technology level. Management characteristics are the second independent variable and contain two dimensions, which are attitudinal characteristics and managerial knowledge. The third independent variable is productivity, which contains three dimensions such as labour skills, level of efficiency and employee behaviour. The final independent is innovation and presented with two dimensions, which are process and product innovation. The moderator which affecting the relationship between independent and dependent variables is government support. Government support is referring to financial support, trade barriers, training and grants (Abdullah & Hussin, 2010).

#### 3.1. Research Instrument (Questionnaire)

Accordingly, to Malaysia Statistics Department, in the year 2014, the total number of food & beverage industry in Malaysia is 6'016 companies and the majority is micro-sized firms. Base on G-Power calculation with the 9 tested variables, the sample size defined as 114 samples (Faul, Erdfelder, Lang, & Buchner, 2007). There are 928 SME companies has found to meet the category as respondents.

Table-1. Measurement of variables.

Variable	Dimension	Element	Source
Export Performance (Dependent Variable)	Economic measures	Export sales growth	(Muhammad & Nawaz, 2009; Sui & Baum, 2014)
		Export profit margin	
		Export sales return on investment	
		Export sales volume	
	Non-economics measures.	Perceived export success	
		Achievement export objective	
Firm Characteristics (Independent Variable)	Firm size	Total sales & profits	Muhammad and Nawaz (2009)
		Number of employees	
	Technology Level	Current technological orientation.	Radojević et al. (2014)
		Machine and equipment age	
	Length of Export Experience	Length for firm export experiences	Muhammad and Nawaz (2009)
		Importance of export experience	
Management Characteristics (Independent Variable)	Attitudinal Characteristics	Management's commitment	Del Río Araújo and Neira (2006)
		Perception towards export advantages & barriers	
		International orientation Customer orientation	
	Managerial Skill and Knowledge	Export attitude	Keese and Tan (2013)
		Management education level	
		Knowledge of foreign languages Years of experience in international operations	
Labour Productivity (Independent Variable)	Labour Skill	Educational Attainment	Guner, Lee, and Lucius (2010)
		Level of Cognitive Skills	
		Skill Information	
	Level of Efficiency	The volume of industry sales per employee	Fiona and Geare (2005)
		Firms' sales per employee	
	Employee Behaviour	willingness to exert effort on behalf of the Organisation.	Omidvar (2006)
employees' Job satisfaction on perceptions procedural fairness			
-Self-develop willingness			
Innovation (Independent Variable)	Process Innovation	The outcome of R&D department	Abdullah and
		Investment in new machine and technology	
		Training for enhancing employee job procedural	
	Product Innovation	Innovation process awareness	
		Investment and spending over product innovation	
		The frequency of introducing a new product	
Government	Financial Support	Mutual fund	

support (Moderating Variable)		the Low-interest loan Incentive provided by government	Hussin (2010)
	Reduce Trade Barriers	Impact of strict rule and regulation Importance of government policy in extending market opportunities Effect of reducing the regulation barrier	
	Grant & Training	Research and development grant that enhances firm capabilities. Government support training Government Research Facilities	Omidvar (2006)

The questionnaire was divided into eight sections:

1. Demographic information from identified respondents.
2. The questions are designed to ask about the company's background to build a profile of the company. Eliminate data (company that not involved in export activities) in data analysis section.
3. To collect information about the dimensions that influence the firm characteristics, dimensions about the firm's size, the duration of the export performance and technology level.
4. To collect information about management characteristics regarding export performance.
5. Questions were related to the dimension of labour productivity such as labour skills, level of efficiency and employees' behaviour to gather the information that affects the firm's export performance.
6. Respondents are required to answer questions regarding the importance of process and product innovation for the firm's export performance.
7. The questions are intended to gather information regarding the moderating variable, which is government support, whether the support provided by the government is a moderating independent variable for export performance.
8. Participants to provide information about the firm's performance including economic performance and non-economic performance.

### 3.1.1. Measurement of variables (Dependent, Independent, Moderating)

This study measured all dependent and independent variables with the defined dimensions, presented in Table 1. The measurement of all variables was inspired by exploring the literature from all relevant fields. This research studied the measures used in previous literature and adapted useful methodologies to create this measurement. Every element of the variables is discussed, and the measurement scale has been defined as below table such as 1 - Strongly Disagree, 2 - Disagree, 3 - Neutral, 4 - Agree, and 5 - Strongly Agree.

### 3.1.2. Validity

The measurement model is a validity test to confirm the instrument used and ensuring that the instrument is applicable to the study. Then, the reliability and validity of the construct were also tested. In the validity test, internal consistency reliability, convergent validity and discriminant validity tests were conducted. To ensure construct validity, responses in the questionnaire must be subjected to Varimax rotated factor analysis. Factor analysis is a multivariate technique that would confirm the dimensions of the concepts that have been operationally defined, as well as indicate which of the items are most appropriate for each dimension (Sekaran, 2003). Validation is needed to ensure the measurement models in the studies can capture the measurement from the original study (Campbell & Fiske, 1959). Researchers are required to employ a different type of construct validity subtypes to evaluate results example; convergent validity, discriminant validity and criterion validity (Sarstedt & Mooi, 2014).

#### 4. ANALYSIS AND FINDING

This chapter describes the results obtained from statistical data analysis and presents the key findings of this research. The results are analysed based on the response rate and through data screening, preliminary analysis, the research model, analysis, and testing for moderating effect.

##### 4.1. Population and Sampling

Probability sampling was chosen to be used as the sampling design. A subset of the population was chosen to represent the population called the sample population. The sample population was selected by using probability-sampling design whereby the stratified random sampling process was applied. The targeted respondents are food processing companies around Peninsular Malaysia. The data collection was conducted using interviews, emails, and mails, in this round of data collection successfully collected 121 responses out of 800 respondents.

**Table-2. Summary of variables reliability, convergent validity and discriminant validity.**

Variables	Measures	Loadings	Cronbach's Alpha	Composite Reliability	AVE
Export Performance	EPS1	0.722	0.84	0.879	0.509
	EPS2	0.734			
	EPS3	0.685			
	EPS4	0.718			
	EPS5	0.725			
	EPS6	0.71			
	EPS7	0.698			
Firm Characteristics	FCS1	0.792	0.799	0.856	0.5
	FCS2	0.687			
	FCS3	0.691			
	FCS4	0.708			
	FCS5	0.772			
	FCS6	0.569			
Government Support	GSS1	0.874	0.939	0.949	0.727
	GSS2	0.853			
	GSS3	0.829			
	GSS4	0.854			
	GSS5	0.856			
	GSS6	0.882			
	GSS7	0.82			
Innovation	INS1	0.803	0.88	0.908	0.586
	INS2	0.829			
	INS3	0.717			
	INS4	0.753			
	INS5	0.844			
	INS6	0.75			
	INS7	0.644			
Productivity	LPS1	0.743	0.856	0.888	0.5
	LPS2	0.707			
	LPS3	0.723			
	LPS4	0.724			
	LPS5	0.588			
	LPS6	0.722			
	LPS7	0.712			
	LPS8	0.725			
Management Characteristics	MCS1	0.649	0.842	0.881	0.514
	MCS2	0.755			
	MCS3	0.648			
	MCS4	0.704			
	MCS5	0.746			
	MCS6	0.737			
	MCS7	0.771			



#### 4.2. Convergent Validity

Convergent validity assesses the degree of correlation between the measurements in one construct (Sekaran & Bougie, 2010). To establish convergent validity, the factor loading of the indicators, average variance extracted (AVE) and composite reliability (CR) should be considered (Hair, Hult, Ringle, & Sarstedt, 2013). AVE, which is a mean-variance extracted for the items loading on a construct, are all above the suggested value of 0.5 (Hair, Black, Babin, & Anderson, 2010). The range of 0.799 to 0.939 as Cronbach Alpha, which surpasses the cut off value 0.7 (Nunnally, 1978). See Table 2.

#### 4.3. Discriminant Validity

Discriminant validity is about “the degree to which measures of different latent variables are unique. In other words, “The variance in the measure should reflect only the variance attributable to its intended latent variable and not to other latent variables” (O’Leary-Kelly & Vokurka, 1998). Discriminant validity is demonstrated by two occurrences: (1) when the measurement items show an appropriate pattern of loadings in which the measurement items load highly on their theoretically assigned factor and not high on other factors, and (2) when the square root of AVE for each factor is larger than any pair of its correlations with any other factor (Gefen & Straub, 2005). As presented in Figure 4, all measurement items show appropriate pattern loadings, i.e., each item loaded higher on its principal construct than other constructs.

As shown in Table 3 and Table 4, the correlations for each construct is less than the square root of the average variance extracted by the indicators measuring that construct, indicating adequate discriminant validity. The new criterion for measuring discriminant validity (Henseler, Ringle, & Sarstedt, 2015) using simulation studies to demonstrate a comparison to old criteria like Fornell & Larcker criterion and cross-loadings are inadequate in measuring discriminant validity. Therefore, HTMT can assess discriminant validity more reliably. If the HTMT value is below 0.90, discriminant validity has been established between the two constructs.

**Table-3. Heterotrait-monotrait (HTMT) correlations.**

	EP	FC	GSS	IN	MC	PD
EP	0					
FC	0.676					
GSS	0.187	0.126				
IN	0.438	0.198	0.207			
MC	0.753	0.596	0.132	0.469		
PD	0.669	0.558	0.134	0.443	0.69	0

**Note:** EP: Export Performance; FC: Firm Characteristics; GSS: Government Support; IN: Innovation; MC: Management Characteristics; PD: Productivity.

**Table-4. Fornell & Larcker Test.**

	EP	FC	GSS	IN	MC	PD
EP	0.713					
FC	0.582	0.707				
GSS	-0.168	-0.079	0.853			
IN	0.38	0.168	-0.193	0.765		
MC	0.644	0.512	-0.047	0.402	0.717	
PD	0.58	0.464	-0.086	0.383	0.591	0.707

**Note:** EP: Export Performance; FC: Firm Characteristics; GSS: Government Support; IN: Innovation; MC: Management Characteristics; PD: Productivity.

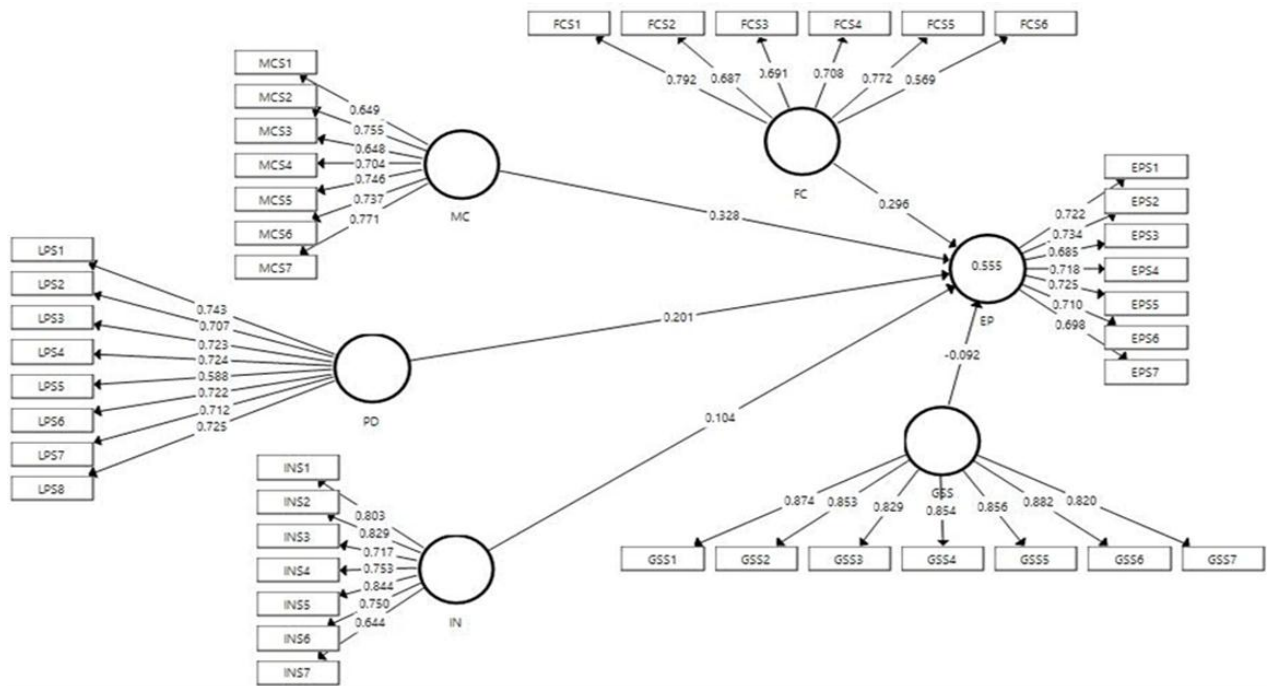


Figure-4. PLS Measurement model of the study.

4.4. Structural Model

4.4.1. Direct Effect

Since the initial purpose of PLS is a prediction, the suitability of the theoretical model is acknowledged by the variance explained ( $R^2$ ) of the indigenous constructs and the substance of all the path estimates (Hair et al., 2013). After estimation of the path estimates in the structural model, a bootstrap analysis was used to measure the statistical significance of the path coefficient. Chin (1998b) advocates 500 re-sampling when operating bootstrapping to estimate a parameter. Therefore, in this study, the bootstrapping procedure with 500 re-sampling was used.

Table 5 and Figure 5 represent the results of the direct effect hypotheses relationships of this research. The endogenous construct (Export Performance) has an  $R^2$  of 0.55, suggesting that 55% (strong) of the variance in export performance can be explained by the dimensions of firm characteristics, government support, innovation, management characteristics, and productivity. Further analysis shows that the  $R^2$  is significantly based on the guideline of R square by Cohen (1988) where the author recommended that 0.02 -0.12 is weak, 0.13 -0.25 is moderate and 0.26 and above is substantial.

Table-5. Direct Effect.

Hypothesis	Path	Beta	Standard Error	T Statistics	P Values	Decision
H1	FC -> EP	0.304	0.101	3.003	0.003	Supported
H2	MC -> EP	0.32	0.081	3.961	0	Supported
H3	PD -> EP	0.202	0.104	1.944	0.041	Supported
H4	IN -> EP	0.123	0.073	1.68	0.049	Supported

Note: EP: Export Performance; FC: Firm Characteristics; GSS: Government Support; IN: Innovation; MC: Management Characteristics; PD: Productivity.

- p-value > 0.10  not significant
- p-value ≤ 0.10  marginal significant
- p-value ≤ 0.05  significant
- p-value ≤ 0.01  highly significant.

The entire hypotheses are significantly supported by the results of this study, the decision based on the significant level of p-value, Beta value also take in consideration in hypothesis decision, if the beta coefficient is positive, therefore every unit increase in the predictor variable, the outcome variable will increase by the beta

coefficient value. If the beta coefficient is negative, every unit increase in the predictor variable, the outcome variable will decrease by the beta coefficient value. As for T-value required to be greater than zero, the greater of T-value (it can be either positive or negative), the greater the evidence against the null hypothesis that there is no significant difference. The closer T is to 0 are more likely there isn't a significant difference. This shows that the fundamental model structure is accepted, without introducing the moderator variable. The structural model of the result is provided in Figure 5.

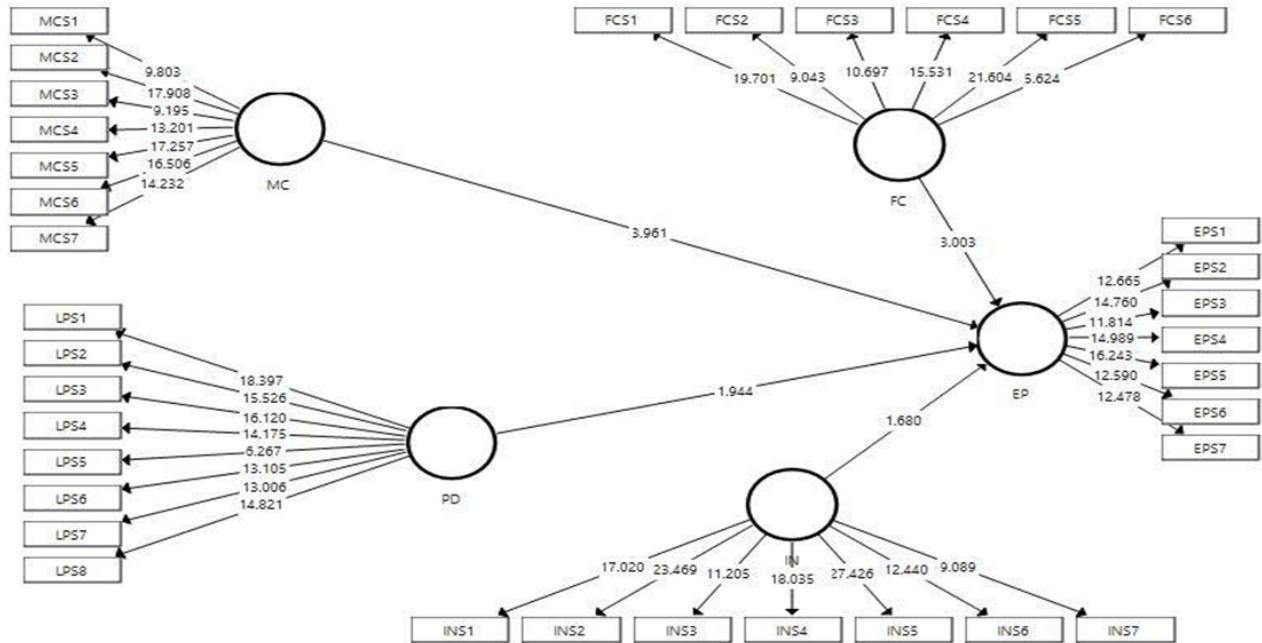


Figure-5. Structural model of the study.

4.4.2. Testing Moderation Analysis

In examining the interaction effect of moderator using PLS, the product indicator approach as recommended by Chin (1998b) was applied to detect the moderating effect of government support on the relationship between a firm’s characteristics, government support, innovation, management characteristics, productivity and export performance. To assess the interaction effect is significant, a bootstrap resampling with 500 re-sampling was employed. Table 6 shows the significant and insignificant moderating effects of government support between independent variables and dependent variables. The results indicate that the moderating effect between productivity, management characteristics and export performance are supported by the results whereas the remaining interaction effects are not supported. For a variable that resulted from p-value greater than 0.10 will be rejected because its evidence there is no significant level within the relationship. Beta value also takes into consideration, for a variable with negative Beta value will also be considered as a rejected hypothesis, as negative beta value is showing that variable resulted in a negative relationship with the outcome.

Table-6. Moderating variable hypothesis test.

Hypothesis	Path	Beta	Standard Error	T-value	P Values	Decision
H5	FC*GSS>EP	-0.137	0.09	1.524	0.128	Unsupported
H6	MC*GSS>EP	0.126	0.075	1.691	0.091	Supported
H7	PD*GSS>EP	0.148	0.086	1.722	0.086	Supported
H8	IN*GSS>EP	-0.138	0.079	1.737	0.083	Unsupported

Note: EP: Export Performance; FC: Firm Characteristics; GSS: Government Support; IN: Innovation; MC: Management Characteristics; PD: Productivity  
 p-value > 0.10 □ not significant  
 p-value ≤ 0.10 □ marginal significant  
 p-value ≤ 0.05 □ significant  
 p-value ≤ 0.01 □ highly significant.

4.4.2.1. Interaction Effect between Management Characteristics and Export Performance

Figure 6 reflect the interaction effect between management characteristics and export performance.

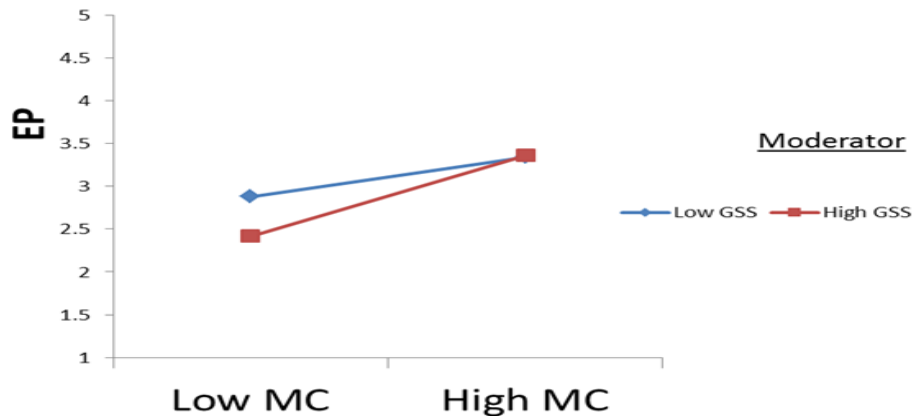


Figure-6. Interaction effect between management characteristics and export performance.

The moderating effect of government support is tested, result shows in Figure 6. In testing the possibility of such management characteristics and productivity was multiplied to create an interaction construct to predict export performance. The AVE and CR of this interaction exceed the minimum cut off point. The estimated standardized path coefficient for the interaction is 0.166 ( $t = 1.18$ ) which is significant at  $p < 0.05$  with R-square of 0.66 which is slightly higher than the R square of the main effect 0.61. The effect size of the interaction effect is 0.001.

4.4.2.2. Interaction Effect between Productivity and Export Performance

Figure 7 reflect the interaction effect between productivity and export performance.

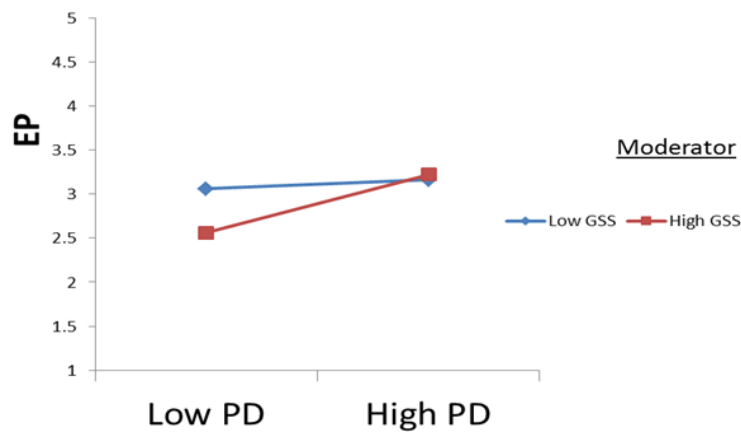


Figure-7. Interaction effect between labour productivity and export performance.

Representation of the hypothesis shows that a high level of government support (GSS) along with labour productivity (PD) enhances export performance (EP). Furthermore, the graphical representation of high government support is steeper than the low level of government support.

4.4. Predictive Relevance of the Structural Model

Hair et al. (2013) have defined predictive relevance ( $Q^2$ ) as “the extent to which a PLS path model predicts the data points of the reflective measure model”. According to them, it is not applicable to the formative measurement model. They have suggested that the predictive relevance of a structural model is established if the above  $Q^2$  value for the dependent variable in all the hypothesized relationships is greater than zero. As suggested by Hair et al.

(2013) the predictive relevance of the proposed structural model is determined through a blindfolding procedure by using a cross-validated redundancy procedure in SmartPLS (version 3.0). The results are given in Table 7. The findings of this study have established the predictive relevance of the proposed structural model with  $Q^2$  values for the dependent variables in the hypotheses relationships being greater than zero.

Table-7. Predictive Relevance.

Variables	SSO	SSE	$Q^2$
Export Performance	847.00	635.7	0.247

#### 4.5. Hypothesis Summary

The hypothesis summary shown in Table 8.

Table-8. Summary of the results of hypothesis testing that has been analysed as below.

Hypothesis Number	Hypotheses Statement	Remarks
H1	SME's internal factors have a positive relationship on export performance.	Accepted
H1a	Firm Characteristics of food processing SMEs able to have a positive relationship on export market performance.	Supported
H1b	Management Characteristics of food processing SMEs able to have a positive relationship on export market performance.	Supported
H1c	Labour productivity of food processing SMEs able to have a positive relationship on export market performance.	Supported
H1d	Innovation of food processing SMEs able to have a positive relationship with export market performance.	Supported
H2	Government support moderates the relationship between SME's internal factors and export performance	Partially accepted
H2a	The positive relationship between firm characteristics and export performance of food processing SMEs will be stronger when perceived government support is high.	Not supported
H2b	The positive relationship between management characteristics and export performance of food processing SMEs will be stronger when perceived government support is high.	Supported
H2c	The positive relationship between labour productivity and export performance of food processing SMEs will be stronger when perceived government support is high.	Supported
H2d	The positive relationship between innovation and export performance of food processing SMEs will be stronger when perceived government support is high.	Not supported

## 5. DISCUSSION AND CONCLUSION

A better position in terms of firm size, technology level and length of export experiences able to achieve higher export performance. The finding proved that food processing SMEs' export performance is influenced by firm characteristics, management characteristics, innovation, and productivity. Increase food processing SMEs' efficiency level will enhance export performance. Efficiency can be improved from process innovation and product innovation. R&D outcome, acceptance of new technology, and firm innovation awareness are factors that enhance process innovation.

Government support contains three dimensions, which are financial support, reduce trade barriers and grant & training. Financial support is the most direct method to support the firm's growth. The second dimension is reduced trade barriers which creating a more favorable government policy for food processing SMEs. The third dimension is grant & training, which enhances firm interest in research and development activities. The research has shown the government can enhance the management mind-set and contribute to the growth of firm's export performance. The government support reducing trade barriers and better government policy, able to increase the confidence and success level for firms to expand in the export market. There are training and conferences held by

the government to firm owners and top management, enabling the food processing industry to expand their connections and business linkages, building up the interest opportunities for the top management to make decisions on exploring the export market.

However, the hypotheses test results show that government support does not have a positive moderating effect for innovation and export performance. This might result from the level of effort from government to food processing firms' innovation still insufficient and the readiness for firms to adopt new innovation still not enough. The moderating variable does not strengthen the relationship between all independent variables to result in better export performance. This result shown government support to food processing SMEs still having room for improvement, especially toward firm's characteristics and innovation factor. In conclusion, government support still plays an important role in enhancing food processing SMEs' export performance. The findings bring out a message to the government on the areas that require more involvement and focus. An additional effort from the government to advocate or promote innovation awareness to the food processing SME is required, at the same time, food processing SMEs also need to be more open to accepting innovative ideas and mindsets. The finding in this research brings better understanding to food-processing SMEs' in terms of variables that influence export performance and able to guide the firm to focus on the right area to improve its export performance.

### 5.1. Limitations

There are a few limitations found in the research. Generalization of the term of owner-managers for SMEs in Malaysia is found to be another limitation in this study. Most SME entrepreneurs are heterogeneous and serendipitous, which causes the perspective on needs and requirements to differ. The measurement of a firm's export performance and other variables are based on the respondents' perspectives, mainly the firm owners or part of a firm's top management. Therefore, the accuracy rate of the result may be uncertain. More accurate information should be directly obtained from a firm's annual report, suppliers, or customer, which can describe the firm's actual condition with more accuracy. Time and resource restrictions cause the limits the researcher from gathering more comprehensive and complete result.

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## REFERENCES

- Abdullah, T. M. C., & Hussin, Z. (2010). Moderating effects of government assistance & turnaround strategies: A research on private manufacturing companies. *Journal of Global Strategic Management*, 4(1), 64-73. Available at: <https://doi.org/10.20460/jgsm.2010415840>.
- Ahmed, E. M. (2012). Malaysia's food manufacturing industries productivity determinants. *Modern Economy*, 3, 444-453.
- Alam, S. S., Jani, M. F. M., Senik, Z. C., & Domil, A. K. A. (2011). Assessing barriers of growth of food processing SMIs in Malaysia: A factor analysis. *International Business Research*, 4(1), 252. Available at: <https://doi.org/10.5539/ibr.v4n1p252>.
- Aziz, N. A., & Yassin, N. M. (2010). How will market orientation and external environment influence the performance among SMEs in the agro-food sector in Malaysia. *International Business Research*, 3(3), 154-164. Available at: <https://doi.org/10.5539/ibr.v3n3p154>.
- Campbell, D., & Fiske, D. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 56(2), 81-105. Available at: <https://doi.org/10.1037/h0046016>.
- Cassiman, B., & Martinez-Roz, E. (2007). Product innovation and exports: Evidence from Spanish manufacturing (pp. 1-36). Mimeo: IESE Working Paper.

- Chin, W. W. (1998b). The partial least squares approach for structural equation modelling. *Modern Methods for Business Research*, George A. Marcoulides, Ed. (pp. 295-336). Mahwah, NJ: Lawrence Erlbaum.
- Cohen, J. (1988). *Statistical power analysis for the behavioural sciences* (2nd ed. Vol. 13). Hillsdale, New Jersey: 12 Lawrence Erlbaum Associates Inc.
- Colpan, A. M. (2012). How does export commitment and product diversity affect the international scope-firm performance relationship?: Evidence from Japan. *Asian Business & Management*, 12, 142-172. Available at: 10.1057/ABM.2012.32.
- Coyle, D. (2009). *The talent code*. New York: Bantam Dell, A Division of Random House, Inc.
- Del Río Araújo, M. L., & Neira, M. C. V. (2006). Managerial characteristics and export performance in spanish SMEs. *Esic Market*, 125, 191-247.
- Economic Planning Unit. (2015). *Eleventh Malaysia plan: Transforming rural areas to uplift wellbeing of rural communities*. Malaysia: Prime Minister's Department.
- Faul, F., Erdfelder, E., Lang, A.-G., & Buchner, A. (2007). G\* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, 39(2), 175-191. Available at: <https://doi.org/10.3758/bf03193146>.
- Fiona, E., & Geare, A. (2005). HRM practice and employee attitudes: Different measures - different result. *Personnel Review*, 34(5), 534-549. Available at: <https://doi.org/10.1108/00483480510612503>.
- Gefen, D., & Straub, D. (2005). A practical guide to factorial validity using PLS-Graph: Tutorial and annotated example. *Communications of the Association for Information Systems*, 16(1), 91-109. Available at: 10.17705/1CAIS.01605.
- Guner, B., Lee, J., & Lucius, H. W. (2010). The impact of industry characteristics on export performance: A three country study. *International Journal of Business and Economics Perspectives*, 5(2), 126-142.
- Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2013). *A primer on partial least squares structural equation modelling (PLS-SEM)*. Thousand Oaks: Sage.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). New Jersey: Upper Saddle River: Prentice Hall.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science*, 43(1), 115-135. Available at: <https://doi.org/10.1007/s11747-014-0403-8>.
- Huergo, E., & Jaumandreu, J. (2004). Firms' age, process innovation and productivity growth. *International Journal of Industrial Organization*, 22(4), 541-559. Available at: <https://doi.org/10.1016/j.ijindorg.2003.12.002>.
- Ibeh, K. I. N., Ibrahim, E., & Panayides, P. M. (2006). International market success among smaller agri-food companies: Some case study. *International Journal of Entrepreneurial Behaviour & Research*, 12(2), 85-104. Available at: <http://dx.doi.org/10.1108/13552550610658152>.
- Katsikea, E. S., & Skarmneas, D. A. (2003). Organisational and managerial drivers of effective export sales organizations. *European Journal of Marketing*, 37(1), 1723-1745. Available at: <https://doi.org/10.1108/03090560310495438>.
- Keese, M., & Tan, J. P. (2013). Indicators of skills for employment and productivity: A conceptual framework and approach for low income countries. A Report for the Human Resource Development Pillar of the G20 Multi Action Plan on Development. OCDE.
- Kumar, D., & Bala, M. (2013). Supply chain risks in today's economy'. *Journal of Management*, 1(2), 53-62.
- Leonidou, L. C., Katsikeas, C. S., & Samiee, S. (2002). Marketing strategy determinants of export performance: A meta-analysis. *Journal of Business Research*, 55(1), 51-67. Available at: [https://doi.org/10.1016/s0148-2963\(00\)00133-8](https://doi.org/10.1016/s0148-2963(00)00133-8).
- Muhammad, S. N., & Nawaz, S. (2009). Firm-level determinants of export performance. *International Business & Economics Research Journal*, 8(2), 105-112.
- Nor Ghani, N., Abul Bashar, B., Jamaliah, S., & Syed, S. A. (2016). Innovation barriers and risks for food processing SMEs in Malaysia: A logistic regression analysis. *Malaysian Journal of Society and Space*, 12(2), 167-178.
- Nunnally, J. C. (1978). *Psychometric theory* (2nd ed.). New York: McGraw-Hill.

- O'Leary-Kelly, S. W., & Vokurka, R. J. (1998). The empirical assessment of construct validity. *Journal of Operations Management*, 16(4), 387-405.
- Omidvar, V. (2006). *Regional and firm level human capital effects on the rate of innovation in food processing firms in Canada*. Master Degree, University of Manitoba, Manitoba, Canada.
- Radojević, P. D., Marjanović, D., & Radovanov, T. (2014). The impact of firms' characteristics on export barriers' perception: A case of Serbian exporters. *Prague Economic Papers*, 23(4), 426-445. Available at: <https://doi.org/10.18267/j.pep.492>.
- Rougoor, C. W., Trip, G., Huirnc, R. B., & Renkema, J. A. (1998). How to define and study farmers' management capacity: Theory and use in agricultural economics. *Agricultural Economics*, 18(3), 261-272. Available at: [https://doi.org/10.1016/s0169-5150\(98\)00021-8](https://doi.org/10.1016/s0169-5150(98)00021-8).
- Sarstedt, M., & Mooi, E. A. (2014). *A concise guide to market research. The process, data, and methods using IBM SPSS Statistics*. Berlin: Springer.
- Schlegelmilch, B. B., & Crook, J. N. (1988). Firm-level determinants of export intensity. *Managerial and Decision Economics*, 9(4), 291-300. Available at: <https://doi.org/10.1002/mde.4090090408>.
- Sekaran, U. (2003). *Research methods for business* (4th ed.). Hoboken, NJ: John Wiley & Sons.
- Sekaran, U., & Bougie, R. (2010). *Research methods for business: A skill building approach*. London: Wiley.
- Sui, S., & Baum, M. (2014). Internationalization strategy, firm resources and the survival of SMEs in the export market. *Journal of International Business Studies*, 45(7), 821-841. Available at: <https://doi.org/10.1057/jibs.2014.11>.
- Tell, J., Hoveskog, M., Ulvenblad, P., Ulvenblad, P., Barth, H., & Ståhl, J. (2016). Business model innovation in the agri-food sector: A literature review. *British Food Journal*, 118(6), 1462-1476.
- Texas A&M AgriLife Communications. (2014). Food shortages could be most critical world issue by mid century. Science Daily. Retrieved from: <https://www.sciencedaily.com/releases/2014/04/140417124704.htm>.
- Trip, G., Thijssen, G., Renkema, J., & Huirne, R. (2002). Measuring managerial efficiency: The case of commercial greenhouse growers. *Agricultural Economics*, 27(2), 175-181. Available at: <https://doi.org/10.1111/j.1574-0862.2002.tb00114.x>.

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