

Involvement of Grower, Supplier and Product Innovation in Determining the Business Performance of Malaysian Poultry Industry: Moderating Role of Management Skills

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Abstract- The study investigates the supply chain actors of poultry industry in Malaysian context. Involvement of grower and supplier has significant impact on supply chain and ultimately success of business while improving the performance of business. Current study entails the important actors of supply chain found crucial in poultry industry, these factors include involvement of grower, supplier and innovation of product to increase quality and enhance performance. The broiler industry has increased rapidly and expected to grow higher in future; to meet the increasing demand supply chain must be effective and responsive towards the market challenges. The research found that involvement of grower has significant impact on business performance, supplier also found to significant along with innovation capability influence business performance in poultry industry. In previous researches managerial skills are ignored but the study explains the moderating effect of management in determining the performance while considering the supply chain actor of poultry industry of Malaysia.

Keyword: *Supplier, Poultry Industry, Innovation, Supply Chain*

1. Introduction

The first part of the current study includes introduction, overview and problem statement. Research objectives and significance of study also included in relation with poultry industry of Malaysia. Livestock production is one the most important industry around the world and it is increasing due to its high demand and its significant contribution in economy of country. The increase in demand since a decade has been observed due to increase in population growth which contributes in economy of any nation [1]. Various studies have been conducted in Asian and African [2], [3], [4], [5] context of farming of livestock. The level of contract

between stakeholders of livestock industry has its own significant importance in supply chain. The relationship between stakeholders of poultry industry has slowly extended around the world [6]. New Zealand supply their finished product to consumers in Japan, and take supplies from Tonga, the supplies of pumpkin from another country and finished product supplies in Japan which involves number of suppliers across the countries.

Socio-economic relationships have been established from contracts as part of large industrialization process and integration of suppliers in agricultural business development. Massive changes have been taken place in last five decades in farming practices and it is widely documented [7]. Moreover, the large-scale production of various commodities includes huge amount of investment and involve number of international suppliers which required effective control to manage production chain and development. Reduction in labor cost, acquire natural and cheap resources, transaction cost reduction and risk transfer while engaging farmers.

Malaysian poultry industry divided in to two categories named as commercial farms and conventional farms. Both categories carry out their business in different way; commercial farms entails integrator for business process in a contract, whereas, conventional farms depends upon independent businessperson. The contract method insures the continuous supply of required material but has nothing to do with manufacturing capability of commodity at reasonable or lower cost [8]. The poultry industry is flourishing according to statistics 3,300 farms with 180 million broiler chickens in Malaysian market. There are 22.9% farms with huge stock of broiler chickens around 50,000 in each cycle; while 26.2% are medium size with the capacity of 20,000 to 50,000 broiler chickens in each cycle

and remainder considered as small scale farms with capacity of 20,000 broiler chickens in each cycle. Huge capacity farms are found in Malaysian states including Johar, Sarawak and Perak which contribute 52% in total national production. Supply of poultry meat is efficient in Malaysian market and found to be 121.8% self-sufficient in broiler fresh meat market. The broiler chicken meat is consumed on large scale as 70% requirement is fulfilled by broiler chicken of total meat market consumption in Malaysia. Hence, broiler chicken meat market considered as major type of meat to be consumed in Malaysian market [9]. Local production and maximization of broiler chicken meat plays important role in business of processing firms, as local grower's production found to be cheaper for these firms. The processing firms rely on import of meats as due to its cheaper cost of availability of chicken.

Currently, growth has been observed in cross-bred chicken as niche market in Malaysia; the type of meat is produced in 80 commercial and semi-commercial farms with the capacity of 5,000 to 20,000 chickens in each cycle [9]. The statistics shows that 1,200 farmers are involved in backyard farming rather than commercial purpose. However, the contribution of this sector is only 1% in national production of poultry meat market. The excessive supply of eggs is exported to Singapore, and increased demand in livestock is an opportunity and advantage for Malaysian growers due to its geographical location to Singapore. The broiler industry enjoyed protection before involvement of WTO and AFTA. Thus, Malaysian broiler meat industry is now facing competition as one of major challenge [9], [10]. The statistics of poultry production shows that 673.87 million day-old chicken and 637 million broilers in 2012. In 2013, production of chicken poultry 770.22 million day old and 720.11 million broilers was projected, as compare to 23 broiler stock companies operating in annual production volumes between 1.38 million to 158.7 million day-old chick [11]. In 2012 there were about 5.66 million birds as standing stock, and researchers have identified that principal breeds were accounting for 96.6% of entire stock; remaining stock was consist on Arbor Acres and Indian River breeds [11]. The statistics also shows that locally produced parent stock contributed 93% in total population of stock. The price for broilers fluctuates between RM 3.20 to RM 5.50 per kilogram with annual average of RM 4.30 kilogram. Cost of production of broilers found to be RM 4.72 to RM 5.09 per kilogram with export of live broilers in 2012 was 42.78 million birds, which shows 7.16% decline as compare to previous years. On the other hand, import of chicken has increased since 2012 by 4.6%. Growth has been observed over number of years in poultry industry of Malaysia during

last decade production growth was recorded as 7.9% from 714,270 metric tons to 1,226,500 metric tons. The consumption at domestic level grew but the pace was relatively lower at 6.5% annually which is 635,210 metric tons to 1,007,140 metric tons according to Department of Veterinary Services, Putrajaya (2013). The statistics shows that total production of broilers 637 million birds which further shows 11.11 million birds weekly production. Average 1.75 million birds on daily basis with an increase of 4.17% as compared to previous decade. The increase is expected to 720.11 million birds with an average production of 1.97 million birds daily. Which show increase of total 42.78 million live broilers and 13,816 metric tons of raw and marinated meat for export purposes (Department of Veterinary Services, Putrajaya., 2017).

Problem Statement:

Poultry and livestock industry plays an important role in economy of any country, vital and essential role is played in Malaysian agriculture sector by livestock. The sector provides jobs to people and source of protein; the sector provides jobs for 29.2 million people locally in Malaysian market during recent years. Consumption of eggs also comes under the livestock sector and found to be very important. The growth rate has been observed in the industry by active involvement of private sector in livestock business. In less time period it was observed that poultry industry managed to improve from slow pace increase to modern and high paced industry growth. The poultry industry in Malaysia has increased significantly and per capita consumption of 30 kg is observed in recent years [12].

The statistics shows the contribution of different production areas of Malaysia, poultry farms in Peninsular Malaysia found to be huge in number as 3.179 since 2013 and 60% production of poultry is from Kedah, Pulau, Penang, and Perak found to be three top broiler production states in Malaysia with highest contribution in livestock industry. The culture and religious beliefs play important role in meat industry as broiler found to be main type of consumption in Peninsula Malaysia. The livestock and poultry industry of Malaysia grow broiler specifically for production of meat to be consumed locally and export internationally. Small and medium sized organizations have specific interest in production of broilers to fulfill demand locally and international export purposes. The statistics shows that consumption of broiler usage has been increased so far in recent years, the progress has been recorded approximately 31kg per capita usage to 38kg per capita usage in current year [12], [13].

Despite of growth in broiler industry growth and usage in Malaysian market or worldwide, the industry also faces number of risks. Feeding industry which is closely and directly associated with poultry play major role in determining the cost of production which is observed as 70% production is delivered by integrators. The current study also focuses the supply chain or integrators of poultry industry as previous studies also considered similar subsector with different issues. The current study will be valuable for contribution in broiler industry of Malaysia and supply chain for efficiency [12]. Poultry industry involved various parties including feed, manufacturing and procurement on competitive basis. The supply chain involved has significant importance as feed chain and whole involved supply chain impact on poultry market. Producers need to search their relevant and quick supply chain for their upstream supply chain with integrator's involvement in process. The risk associated in supply chain may harm poultry firms in efficiency, cost and quality. The firms need to research for integrators with efficient response, lower cost and high quality commodity for effective business process and production. The poultry industry come across problems related to lack of professionalism, lack of managerial skills, accounting issues and efficiency issues [13].

The previous studies have embarked on the issue of management, accounting and financial control in various countries but they never considered problems associated with supply chain of poultry industry [14], [15]. Entire supply chain of poultry industry is rarely discussed in literature, there is scarcity of empirical studies on supply chain of poultry industry which involves supply chain, stakeholders and important players from economic and strategic point of view, which addresses to structure and conduct performance analysis of broiler business operators in Malaysian market. Value chain analysis is need to be conducted to highlight the problems in broiler industry of Malaysia, the study must entail the involvement of suppliers and growers which also includes intermediaries specially related to facilities and input available for farming. These important nodes of supply chain include buyer, manufacturer or grower and seller of feed or other related inputs for poultry industry farming. The importance of all these participants of supply chain for poultry industry has significant importance for production of quality meat and sustainable production of meat for meeting local and international demand.

2. Literature review

The SCM (supply chain management) was appeared in literature in 1980s, and remained attractive point of concern for various researchers. The industrialist specialist and academicians researchers took interest in the topic of SCM in rapidly changing environment and to sustain competitive advantage [16]. Literature has described SCM as individual system, resources utilization, services, activities and flow of information between all entities [17].

The integration of all processes in supply chain network and management of these nodes found to be effective in business processes of poultry or any other business processes. Researchers have focused and emphasized that the effective integration of suppliers and customers to fulfill and gain objectives of firms of gaining and sustaining competitive advantage associates with supply chain management [18]. The activities of organizations related to manufacturing, delivering of product or services comes under the umbrella of supply chain. The progression of all nodes of supply chain from suppliers of raw material and it end up to the customers in market [18], [19]. The literature shows that operational activities involve management of inventory, procurement, forecasting, scheduling, production of goods and quality control; further, facilities includes factories, warehousing facilities, processing of departments, distribution departments and offices of coordination. Literature has defined two types of movements of supply chain: 1) physical material and its movement in supply chain and 2) information exchange between different departments of upstream and downstream supply chain [18].

In rapidly changing environment and highly competitive business environment supply chain management found to be one of significant important due to increased complexity of systems to manage resources and information across the business world. Complexity of supply chain depends upon the business category and manufacturing and services. Manufacturing sector believed to be complex as compare to services. Policies of firms and activities of firms carried out during the production phase determine the performance of supply chain [18]. Therefore, flow of material got affected by their production activities and information. The policies and rules for effective utilization of supply chain implement coordination mechanism for gaining sustainable competitive advantages. SCM serves the purpose of efficiency and effectiveness for companies and firms to increase performance and lower the cost of business operations. Procurement of raw material including transportation, operations and distribution of commodity to customers for improvement in whole supply chain [20]. Supply chain

plays important and critical role in successful business operations [21]. Supply chain entails major issues which include expansion of activities which deal globally, sourcing at global scale, price changing and rapidly growing firms. The successful implementation of SCM is not an easy task for firms to gain successful competitive advantage. The efficient supply chain contributes in large benefits of firms for gaining competitive advantage [18], [22].

Supply chain nodes includes integrators, manufacturing units or departments, distribution chains, retailers and growers of any commodity and needs to be effective in terms of coordination. Growers of poultry industry found to be very important and crucial part of supply chain. For effective supply chain growers and their need has to be fulfilled for grasping benefits and profits [23], [24]. Inventory management of any firm or commodity has its own importance in effective supply chain. With the idea of inventory management concept was extended to whole supply chain to gain benefits.

Supply chain and poultry industry:

Integrator is considered as important node of supply chain of poultry industry's supply chain. Vertical supply chain in poultry industry includes breeding of birds, feeding birds, slaughter of chickens and processing facility at the end of integrator. The description of the whole process and supply chain in poultry industry is given in literature. The supply chain includes food merchants and food masters required for broilers, further, it includes chicken breeders and boiler farms. It includes contract or non-contract farmers involved in processing of birds, after that poultry processor, and then distributors takes place to supermarkets or retailers which further delivered and sold to be consumers [23]. Technology advancements also has important inclusion in supply chain for coordination effectiveness and contributes towards the maintenance of standards in the process. Operations of firms throughout supply chain including distribution networks from supermarket and grocery stores and to consumers.

Poultry industry of Malaysia expected to face various challenges in future to meet the demand of consumers which includes challenges related to the supply chain of poultry. The studies have stated that huge demand will be increased up to 2050 gradually and finally it will hit 9 to 9.6 billion people to be fed with poultry broiler birds [25], [26]. The huge increase in demand in poultry product up to double the demand of today; effective supply chain must be needed for poultry industry. According to DEFRA (2017) growers and poultry industry needs to increase their production by 70% in future to meet the expected demand of broilers. Similar

findings have been shared by Food Agriculture Organization of United Nation (FAO).

Constructs of study:

Grower Involvement and Business performance:

Business performance largely depends upon effective supply chain of business; whenever any firm attempts to improve business performance with efficient management of supply chain so coordination with stakeholders must be ensure [27], [28]. Integration with suppliers and style of involvement and scale of close relationship with supplier enable organization to harvest benefits on larger scale and for sustainability of competitive edge, as it doesn't only depends upon simple partnership with suppliers [29], [30]. Effective business performance can be achieved by involvement of suppliers in operational aspect and merging interest of suppliers and business operators and finally to the customers [31], [32]. Establishing relationships with suppliers or other important participants of supply chain ranges from formal and codified mutual relations types which are stated as options for business operators [33], [34]. The categories of relationships between suppliers, growers and business operators of poultry industry have been identified as 'contractual' and 'relational'. Literature suggested establishing long term relations which ensure stability of relationship with major suppliers of relevant industry [35], [36]. The researchers suggested several forms which includes firstly, key suppliers must be integrator for value addition, secondly, key supplier must maintain high standards of product or services, third effective communication and high level of interaction must be ensure for exchange of information [37], [38].

Business operators must share the necessary information with suppliers in order to improve the performance of supplier's goods or services for value addition and to generate benefits. Further, suppliers' involvement for development of new products found to be effective which ensure the solid and strong relationships and resulted in benefits [39], [40]. The join planning between supplier and business operators of poultry industry; for production development and for improvement in supply chain, level of trust plays important role in business performance [41]. Literature in recent studies depicted that business performance is positively influenced by involvement of suppliers for effective business operations [42], [43]. Therefore, researcher in current study decided to validate same line of research and relation for poultry industry of Malaysia to examine the effect of suppliers' involvement.

Grower involvement is defined as participation of grower in design of product development and provides their consultancy for problem solving and further phases [44]. The product design, process engineering and production operations must be consulted with major grower of poultry industry for effective supply chain and benefits at large scale. Key success factor for production and development, communication with external stakeholders including growers found to be effective [45]. External communication with stakeholders especially with suppliers or growers latest up to date and correct information from diverse sources, thus results in an increase of quality development process [46]. Effective communication enables organizations to share complex, ambiguous and latest information timely with their relevant stakeholders [47], [48].

Supplier Involvement and Business performance at poultry industry of Malaysia:

Supplier involvement found to be important and crucial in success of supply chain or business performance improvement. Supplier involvement is defined as direct participation of integrator during process of product development, in the current study poultry industry is under discussion and supplier of raw material must have effective involvement in whole process for timely and managed supply chain [49], [50], [51], [52]. Supplier involvement helps firms to acquire resources and skills needed at operational stage while consulting with suppliers to initiate any innovativeness for production or business processes. The involvement of new technological advancements for production innovation is encouraged to adopt and learn for suppliers and operators to satisfy buyers or to gain objective of business for performance improvement. Supplier's involvement enables companies to improve performance of their business operations and products or services [53], [54], [55]. The competencies of business known as the best things a business can perform under three conditions; first, provides benefits and value to the customers, second, it must be difficult to imitate for competitors, third, maximum advantage must be generated by these products in market. There are various different form found as core competencies related to knowledge and markets [56].

The importance of supplier in supply chain is clear by previous literature and current study also entails the involvement of supplier to examine the business performance in poultry industry of Malaysia.

Product Innovation and business performance at supply chain of Malaysia poultry industry:

Literature has given various diverse view point related to product innovation and it's not possible to state single definition of innovativeness which is acceptable widely. The technological advancements in business processes are also depicted as innovation in continuing the business for gaining competitive advantages [57], [58]. Literature has stated and indicated the importance of marketing and advanced technological aspects on large or small scale businesses for defining innovation. The various studies proposed methods for innovation classification for academician and practitioner to understand types of innovation. The operational aspect of product innovation is also depicted by these researchers with the respect of industry and business and especially growers [49], [37]. The studies and approaches previously stated by researchers used market offering [57], product awareness [59], but the aspect of advantages and innovativeness is missing. Current study entails the product innovation construct to examine the business performance in poultry industry of Malaysia. The study fulfills the call to address the research gap to empirically examine the relationship of product innovation and business performance with other unique construct found to be influence on poultry industry performance.

Although, there is research found on the role of product innovation that it contribute for firms to respond to market changes and customer requirements. Few studies also categorized the innovation types and categorized innovative behavior at small or large scale organizations [60], [61]. The researchers have analyzed two different typologies in innovation strategies including proactive innovation and non-innovators or reactive innovators which consider intermediates. The literature is scarce in examining the impact of product innovation on business performance, it seems necessary to empirically examine the impact of product innovation in poultry industry of Malaysia. Above discussion encourage researcher for empirically examine the relationship.

Business performance at broiler industry of Malaysia:

The business of any category can't be manageable if performance is ignored or organizations don't consider their performance indicators [62]. If organization of any category strives to gain competitive advantage and tries to sustain it they must define their performance standards and key performance indicators for effective management and control for flourishing their business in highly competitive environment. The performance of business must be measured as consequences of input given at first stage of the business [63]. Researchers and practitioners aims to examine the performance of business to ensure their

compliance with standards to gain competitive edge and perform better in highly competitive environment [64]. Current study intends to examine the performance of broiler industry of Malaysia; researchers have extended the area of performance measurement in three aspects. It included to examine the innovation, product development capability, satisfaction of grower, retention of grower and cost [65], [66].

Business performance attracted number of researchers to examine as dependent variable. It could be define in financial performance and non-financial performance of organizations which includes different dimensions. Literature suggests to examine mixed performance of organizations which is influenced by various other constructs in relation to the study. For this reason literature categorized performance as financial and non-financial performance. Literature suggested to consider both aspects of performance and to examine mixed performance. The researchers examined the performance constructs in different countries such as China, India, Mexico and United states to examine effect on quality management and non financial performance. Non-financial performance defined as organizational operating performance with productivity, rework, and throughput time and market shares [67], [68].

Current study intends to examine the business performance in poultry industry of Malaysia. Researchers have used different approach as compare to traditional approach for examining the performance measurement, different approach has been taken for livestock industry especially related to broiler production. The performance indicators for measuring poultry industry and broiler's industry includes time of delivery, costs, quality, defect rate, productivity, grower and employee's satisfaction, innovation and number of employees by Terziovski et. al.

The performance indicators for broiler or poultry industry are given by L. Manning, R. Baines and S. Chadd, 2008 [69]. The supply chain of livestock needs to be more effective and more than to gain competitive edge or to reduce the cost. The processes must be understood to carry out all operations including sharing of ideas and to share information on time among different nodes of supply chain. The effective communication generates compliance with stakeholders and constant improvements which remains primary important for driving business improvements.

The current study examines the business performance of poultry industry of Malaysia and entails grower involvement, supplier involvement and product innovation as influential constructs for improved performance. The

study further examines the moderating role of managerial skills carried out in effective supply chain at poultry industry of Malaysia.

Moderating role of Management in relationship between Grower involvement, supplier involvement, product innovation (Independent Variables) and poultry business performance (Broiler Industry Malaysia):

Skills are integral part of any business and organization as management skills contributes for performance in any industry in any part of the world. According to Economic theory skills can be created by various means which found to be helping in managing operations at firm level [70]. Managerial skills in agriculture or poultry sector didn't attract much attraction and overlooked for number of years. There is need to develop skills in agriculture and poultry related food system to improve supply chain and to maintain organizational efficiency for gaining competitive advantages [71], [72]. Specific characteristics are needed in management to conduct transactions at poultry industry business for effective supply chain. Skills influence performance of business by offering and contributing in effectiveness of their business operations as these specific skills are required for poultry industry.

Increased attention has been given to food supply system with the complexity associated with the sector. Poultry industry has different nature and different practices needed to carry out the business; more challenges and requirements have been faced from government. Today, in competitive environment organizations need to focus on managerial skills to increase efficiency and to main competitive advantages [73], [74]. Management is an invisible factor and skill in whole process which has significant impact. Management found to be important just like factors of production after capital, land and workforce. Quality of management must be in place as it is an important for production function [75]. It is recommended by researchers to use managerial skills in explaining the relationships between different constructs of supply chain for determining the performance [76], [77], [90-94].

Managers at poultry industry and in supply chain mechanism they must be equipped with managerial skills to gain efficiency of functions for achievement of targets. Managerial skills assist managers for making right decisions for managing finance, workforce, physical resources and risk issues. Production quality, access to markets, methods to grow and decisions must be taken on facts [78], [79].

The current study entails the moderating role of managerial skills between influential factors (Independent variables) and poultry business performance (dependent variables). Managerial skills of grower and supplier or any node of supply chain determine the broiler business' success. Effective monitoring of manager at poultry business can impact profit ratio by reducing cost and wastage at business operations.

3. Research Framework:

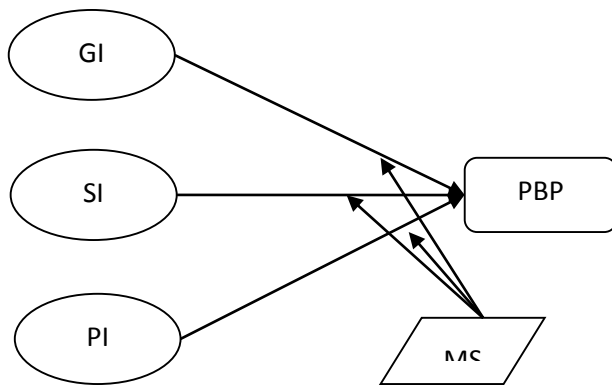


Fig: 1 Framework of study

Hypothesis of study:

H1: Grower's involvement influence poultry business performance in Malaysian broiler industry

H2: Supplier's involvement influence poultry business performance in Malaysian broiler industry

H3: Product Innovation influence poultry business performance in Malaysian broiler industry

H4: Managerial skills moderate relationship between grower's involvement & poultry business performance in Malaysian broiler industry

H5: Managerial skills moderate relationship between supplier's involvement & poultry business performance in Malaysian broiler industry

H6: Managerial skills moderate relationship between product innovation & poultry business performance in Malaysian broiler industry

4. Research Methodology:

There are various methods used for research design and methodology; current study is conducted on poultry industry of Malaysia and survey method is used as it is common and easy for examining empirical relationships [80]. The survey method is also helpful for incorporating larger sample size and easy to administer with moderate cost of collection of data. Based on these advantages of survey method, researcher intendeds to use survey method for data collection to examine the performance of poultry industry of Malaysia. The objective of study includes examining relationship of involvement of grower, supplier and product innovation on performance of poultry business with moderating effect of management skills.

Population and sample size:

The department of Veterinary services of Malaysia has been used as sample size by various researchers for data collection. Quality and availability of respondents always considered as an important factor in data collection, current study relates to supply chain of poultry industry of Malaysia and data must be collected from best knowledge keepers of industry. The population for current study consists on involved contractors of broiler production segment in Malaysia. The reason of this population is because they are closely related to poultry business and supply chain. These selected broiler producers are highest in ranking with highest contribution in meat market (MyCC, 2012). The population of current study was from poultry industry as they are appropriate to examine the relationship of influential variables on business performance of broiler industry.

The questionnaire was sent to all these relevant respondents, a total 500 questionnaire were sent and 215 were returned among 200 were useable. The response rate is sufficient to generalize the findings [81].

Instrument:

Each variable was examined on 5 point likert scale, the scale of each construct was adopted from different resources.

Business performance for poultry industry:

Dependent variable 'poultry business performance' was used to understand and examine the performance of poultry industry. The questionnaire was adopted from past studies of Li, et al., 2006; later it was modified according to poultry

industry by Agus (2011). Items of scale were measured on 5 point likert scale from “very low” to “very high”. The cronbach alpha α for this construct was reported as 0.71.

Grower’s Involvement (GI):

Independent variable GI found to be an important factor in success of any business and efficiency of supply chain. The construct scale was adopted from the M.F.Svendsen, et. al. (2011) and was examined on 5 point likert scale to determine the performance of supply chain of poultry industry. The cronbach alpha α for this construct was reported as 0.73.

Supplier’s Involvement (SI):

Independent variable SI has significant importance in determining the performance of supply chain which has impact on performance. The involvement of supplier was examined by using scale developed by Athaide & Klink (2009) and was examined on 5 point likert scale. The cronbach alpha α for this construct was reported as 0.81.

Production Innovation (PI):

Innovation has significant importance for determining the performance and efficiency of any business. The scale was adopted from Wynstra & Ten Pierick(2000) and was examined on 5 point likert scale to determine performance and relationship between constructs. The cronbach alpha α for this construct was reported as 0.79.

Management skills (MS):

Management skills (Moderator) at poultry industry were examined by using scale of Martino & Polinori (2011). The cronbach alpha α was reported for construct was 0.80.

5. Results and discussion:

Measurement model:

Relationships depicted in research framework and hypotheses are examined by using SMART PLS by MM and SEM techniques. Cronbach alpha was examined of all constructs for examining the reliability of scale. The table 1 shows alpha values for each construct and therefore has strong reliability.

Table 1: Cronbach Alpha (α) Values of all constructs:

S#	Construct	α	Remarks
1	P(poultry)BP	0.71	Good
2	GI	0.73	Good
3	SI	0.81	Good
4	PI	0.79	Good
5	MS	0.80	Good

Internal consistency confirmation is assessed by investigating composite reliability (CR) and average variance extracted (AVE). CR must be higher than 0.7 and AVE must be greater than 0.5 [82]. Table 2 shows all CR and AVE values of constructs and indicate strong convergent validity.

Table 2: Composite Reliability and Average variance extracted:

S#	Construct	AVE	CR
1	P(poultry)BP	0.81	0.84
2	GI	0.93	0.94
3	SI	0.83	0.88
4	PI	0.76	0.80
5	MS	0.90	0.91

Measurement model also entails discriminant validity of constructs. Correlation of each variable was compared and AVE was calculated in table 3; diagonal values shows discriminant validity and non diagonal values shows square roots.

Table 3: Discriminant Validity of constructs

Constructs	PBP	GI	SI	PI	MS
P(poultry)BP	0.818				
GI	0.723	0.941			
SI	0.799	0.881	0.811		
PI	0.710	0.791	0.745	0.809	
MS	0.610	0.612	0.681	0.619	0.799

Structural Model:

The current study used PLS-SEM for establishment of structural model and used bootstrapping procedure. Hypothesis testing is discussed in this phase of the study. Hypothesis Testing:

Hypothesis 1: *Grower’s involvement influence poultry business performance in Malaysian broiler industry*

Results showed that hypothesis one statistically significant positive relationship between GI and poultry business performance at livestock industry of Malaysia, with path coefficient of 0.436 and a t-value 4.12 at 0.01 level of significance. Therefore, H1 supported.

Hypothesis 2: Supplier's involvement influence poultry business performance in Malaysian broiler industry

The results of second hypothesis also found to be significant positive relationship between suppliers' involvement and business performance at broiler industry of Malaysia. The results in table 4 show the direct effect between construct of hypothesis 2. Path coefficient of relation is observed as 0.324 and t-value is observed as 4.938 and sig level of 0.01. The t-value of relationship found to be higher than the cutoff point 1.96; Therefore H2 supported.

Hypothesis 3: Product Innovation influence poultry business performance in Malaysian broiler industry

In table 4; he results of third hypothesis also found to be significant positive relationship between product innovation and business performance at broiler industry of Malaysia. The results in table 4 show the direct effect between construct of hypothesis 3. Path coefficient of relation is observed as 0.424 and t-value is observed as 4.018 and sig level of 0.01. The t-value of relationship found to be higher than the cutoff point 1.96; Therefore H3 supported.

Hypothesis 4: Managerial skills moderate relationship between grower's involvement & poultry business performance in Malaysian broiler industry

In table 4; moderation effect of Management skills is shown; hypothesis 4; results shows t-value 4.071 found to be higher than cutoff point 1.96; which indicate that management skills moderate statistically significant between grower involvement and business performance. Therefore, H4 is accepted. The moderating effect of management skills on the relationship between GI and PBP found β value as ($\beta = 0.401$, $t = 4.093$, $p < 0.05$), hence H4 accepted on statistical grounds.

Hypothesis 5: Managerial skills moderate relationship between supplier's involvement & poultry business performance in Malaysian broiler industry

In table 4; moderation effect of Management skills is shown; hypothesis 5; results shows t-value 4.193 found to be higher than cutoff point 1.96; which indicate that Management skills moderate statistically significant between SI and PBP. Therefore, H5 is accepted. The moderating effect of MS on

the relationship between SI & PBP found β value as ($\beta = 0.521$, $t = 4.193$, $p < 0.05$), hence H5 accepted on statistical grounds.

Hypothesis 6: Managerial skills moderate relationship between product innovation & poultry business performance in Malaysian broiler industry

In table 4; moderation effect of management skills is shown; hypothesis 6; results shows t-value 1.013 found to be lower than cutoff point 1.96; which indicate that MS doesn't moderate between PI & PBP. Therefore, H6 is rejected. The moderating effect of MS on the relationship between PI & PBP found β value as ($\beta = 0.0011$, $t = 1.013$, $p < 0.05$), hence H6 rejected on statistical grounds.

Table 4. Results of all hypothesis of study:

S#	Relationships	β	T-Value	Decision
1	GI→PBP (D)	0.415	4.12	Accepted
2	SI→PBP (D)	0.324	4.938	Accepted
3	PI→PBP (D)	0.424	4.018	Accepted
4	GI*MS→PBP (I)	0.401	4.093	Accepted
5	SI*MS→PBP (I)	0.521	4.193	Accepted
6	PI*MS→PBP (I)	0.001	1.013	Rejected

6. Conclusion:

The study determines the business performance of supply chain of poultry industry in Malaysia context. The study entails the three important nodes or independent actors (variables) of supply chain of poultry (broiler) industry. These variables included grower's involvement, supplier's involvement and product innovation for determining the business performance. Supply chain in poultry industry is highly significant and crucial for business success for rapidly growing market as it is difference than usual supply chains systems adopted by different businesses around the world [83, 84].

Malaysian poultry industry has grown significantly and expected to grow at higher pace in future. The supply chain of poultry industry is complex in nature due to category of product and availability of material and information sharing among these actors found to be significantly higher. Grower found to one of very effective and significant influential factor for success of business in poultry industry, another important factor supplier's involvement is statistically significant for performance determination. Innovation at

firms found to important and significant for development of product and update business process to reduce cost and enhance quality to improve business performance.

Management skills have crucial role to define for managing activities at poultry industry; previous studies ignored the role of managerial skills in poultry industry but it was well tapped in other field of research. Current study found that managerial skills are needed to manage successful supply chain activities between all constructs. The moderation role of management skills between grower, supplier involvement and product innovation has depicted in the study [85, 86, 87]. Management skills moderate relationship between grower and suppliers' involvement but failed to find any moderating effect on business performance by product innovation in broiler industry of Malaysia [88, 89-99].

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