

NEW MODEL OF COMPETITIVE ADVANTAGE OF SUPPLY CHAIN MANAGEMENT PRACTICES A CASE OF INDONESIAN CACAO MANUFACTURING INDUSTRY

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Abstract

One of the phenomenon of Cacao industry in Indonesia is the problem along its supply chain from upstream to downstream which affect the competitive advantage and ultimately the performance. The latest theory of operation management and hot topic to be discussed is concept of supply chain management and strategy. There is a limited research on supply chain and strategy with this combination of variable and specific case in cacao industry of make this study will give a high contribution and value advantage for cacao industry. This paper aims to introduce the study of new model of competitive advantage and performance which is driven by supply chain management practices and supply chain strategy. Main purpose of the study was

to build and to validate an instrument to measure the effect of supply chain management practices, strategy and competitive advantage and impact to business performance perception among Indonesian cacao companies. The methods used in this study are descriptive and explanatory methods. The Unit of analysis in this research is Indonesian Cacao manufacturing industry, while observation units were Chairman and Senior Managers. Analysis tools used are structural equation modeling base on variant with new SmartPLS and SPSS. Finding of this research are a new model of competitive advantage which research results are (1) supply chain management practices (SCM) factors influencing on competitive advantage but not influencing the performance directly (2) supply chain strategy factors influencing the performance both direct and indirect (3) competitive advantage influencing on the performance.

Keywords: Supply Chain Management, Strategy, Competitive Advantage, Performance, Cacao Manufacturing Industry, Indonesia

INTRODUCTION

The issue of business performance in the cacao processing industry tends to decline from year to year it can be seen *in the gap* in terms of number of companies engaged in the processing of cacao beans and companies processing chocolate should reach the ideal number, it this is also evident from the capacity of production and installed capacity has not increased significantly (AIKI, 2015).

The decline in business performance in the cacao processing industry caused by the competitiveness of the cacao industry is still low due to the company's competitive advantage compared to countries exporting cacao beans and derivative products are better for some time. Competitive advantage is still low seen in terms of quality, fat content, taste and availability of supply is still far behind compared to others this is also reflected in lower prices due to get the discount. If seen weak competitiveness or competitive advantage of the company, the aspect of supply chain management, and supply chain strategy plays an important role.

Aspect of supply chain management is a very long starting from the farmer to the processing of cacao beans to the end customer is the manufacturing of chocolate resulted not efficient and expensive cost is a phenomenon faced by companies in the cacao industry at this time, so the competition among companies not only competition between companies widely but competition between the supply chain specifically with the selection of appropriate strategies by anticipating high uncertainty, so grow the competitive advantage.

Conditions of supply chain management is less efficiently will require effective supply chain strategy where the current strategy that is supposed to be able to anticipate the availability of raw materials supply for the cacao industry, the process is efficient and the ability to anticipate customer demand tends to fluctuate, but the condition is still far from expectations so there are still factories operating in a state of *full capacity* and tend torpor. Supply chain strategy is less effective and it cannot be separated from environmental uncertainties. Base on the phenomena, researcher find out a model of competitive advantage which is driven by supply chain management and supply chain strategy through competitive advantage to improve business performance in cacao industry.

Issue Identification and Problem Restriction

Based on the description above, the phenomenon of the problem can be identified problems in this study as follows;

- Necessary efficient and effective supply chain management practices.
- Effective supply chain strategy,
- Competition between the supply chain very influential in competitive advantage and impact on business performance.

Under these conditions, this study is limited only aspect of the supply chain and strategy which affects the competitive advantage and impact on performance business. The scope of research is from upstream (cacao supplier), cacao processing industry and downstream (customer of cacao industry).

Research Questions

1. How do effect of supply chain management, and supply chain strategy on competitive advantage either partially or simultaneously?
2. How do effect of supply chain management, and supply chain strategy on business performance either partially or simultaneously?
3. How does effect of the company's competitive advantage to business performance?

Research Objectives

1. To examine the effect of supply chain management and supply chain strategy on competitive advantage either partially or simultaneously.
2. To examine the effect of supply chain management and supply chain strategy on the performance of the business either partially or simultaneously.
3. To examine the effect of competitive advantage to business performance.

LITERATURE REVIEW

Supply Chain Management (SCM)

SCM Professional (2010) defines SCM as planning and management activities that include search and procurement, conversion, demand creation and fulfillment and all logistics management activities including the coordination and collaboration of channel partners consisting of *suppliers, intermediary, a third-party service providers and customers*. *Li et. al (2005)*, defines the SCM Practices (SCMP) as a set of activities undertaken by an organization to demonstrate the effectiveness of supply chain *management*. *Chin AT et.al (2011)*: SCMP including approaches and activities used by an organization to streamline integration of *supply and demand* for the improvement of supply chain management. According to *Li et.al (2005)*, the concept of SCMP consists of dimensions; *Strategic supplier partnership, customer relationship, information sharing, information quality, internal lean practices, and postponement*.

Table 1. Dimension of the SCMP

Authors	Dimension
Tan et al. (2001)	<i>Supply chain integration</i> <i>Information sharing</i> <i>Supply chain characteristics</i> <i>Customer service management</i> <i>Geographical proximity</i> <i>JIT capability</i>
Ulusoy (2003)	<i>Logistics</i> <i>Supplier relations</i> <i>Customer relations</i> <i>Production</i>
Chen and Paulraj (2004)	<i>Supplier base reduction</i> <i>Long-term relationship</i> <i>Communication</i> <i>Cross-functional teams</i> <i>Supplier involvement</i>
Min and Mentzer (2004)	<i>Agreed vision and goals</i> <i>Information sharing</i> <i>Risk and award sharing</i> <i>Cooperation</i> <i>Process integration</i> <i>Long term relationship</i> <i>Agreed supply chain leadership</i>
Li S. et al. (2005)	<i>Strategic supplier partnership</i> <i>Customer relationship</i> <i>Information sharing</i> <i>Information quality</i> <i>Internal Lean Practices</i> <i>Postponement</i>

Source: Li S. et.al (2005)

Supply Chain Strategy (SCS)

Corporate strategy is defined as a theory about how to obtain a competitive advantage. Good strategy is a strategy that produces advantages (Barney and Hesterly, 2010, p4). *Cohen and Russell (2005) and Wisner (2003)* defines the SCS as a strategy that can (1) is universal and integration in business activities (purchasing, production, sales and logistics) made in long chains, (2) gives the maximum value for the end user and this strategy should be run for the improvement of cooperation and give confidence good relations between actors in the supply chain. *Sun and Hsu (2009)* states that SCS is right in its implementation in the SCM process is believed to improve the business performance or the performance of SCM. *Sun and Hsu (2009)* took the study of Lee (2002), SCS can be divided into four dimensions or indicators that is efficient, *responsive*, *risk hedging* and *agile*. Some concepts and dimensions of SCS related research can be seen in Table 2 below;

Table 2. Dimension of the SCS

No	Authors	Dimension
1	Chase et.al (2003)	<i>Responsive and Efficiency</i>
2	Russel and Taylor (2003)	Efficiency and Flexibilities
3	Ballou (2004)	<i>Cost reduction, Capital reduction, Service improvement</i>
4	Mahadevan (2007)	<i>Responsive and Efficiency</i>
5	Heiser and Render (2007)	<i>Supplier negotiation, Partnership (long term), Vertical integration, Keiretsu, Virtual supply chain</i>
6	Sun and Hsu (2009)	<i>Efficiency, Responsive, Risk Hedging, Agile</i>

Source: Sun and Hsu (2009)

Competitive Advantage (CA)

The company has a competitive advantage when it is capable of creating economic value (*economic value*) more than the competitors. *Economic value* = difference between the benefits obtained by the customers who buy your products or services and economic costs (*economic cost*) of the product. Furthermore, the size of the companies that have a competitive advantage is the difference between the *economic value* of companies with *economic value* competitors (*Barney and Hesterly, 2010, p10*). *Michael Porter* put forward the notion of competitive advantage as follows: *A competitive advantage is an advantage over competitors gained by offering consumers greater value, either by means of lower prices or by providing greater benefits and service that justifies higher prices. (1993: 4).*

Competitive advantage is a factor which an organization is able to create a condition that can survive against competitors and including a condition that allows different organization from its competitors (*Li et.al, 2006, p111*). *Hao Ma (1999)* gives the definition of competitive

advantage: *Competitive advantage as the asymmetry or the differential in any firm or dimension attribute that allows one firm to better serve the customers than others and hence create better customer value (1999).*

Li, 2010 and Kouftero, 1995: the dimensions of competitive advantage consists of price, quality, delivery dependability, product innovation and time to market. Thatte, AA, S. Suba Rao, Ragu Nathan, TS (2013) the same dimensions of competitive advantage, namely; price / cost, quality, delivery dependability, time to market and product innovation. Dimension of the competitive advantage insist of price, quality, delivery dependability, product innovation and time to market. The dimensions can be seen in the following Table 3 below;

Table 3. Dimension of the CA

Authors	Dimension
Koufteros, 1995, Rondeau et al, 2000, Suhong Li, 2002, Thatte, A.A, et,al (2013)	Price/ Cost
Koufteros, 1995, Rondeau et al, 2000, Suhong Li, 2002. Thatte, A.A, et,al (2013)	Quality
Koufteros, 1995, Rondeau et al, 2000, Suhong Li, 2002. Thatte, A.A, et,al (2013)	Delivery Dependability
Koufteros, 1995, Rondeau et al, 2000, Suhong Li, 2002. Thatte, A.A, et,al (2013)	Product Innovation
Suhong Li, 2002. Thatte, A.A, et,al (2013)	Timeto Market

Sources: Suhong Li, 2002. Thatte, A.A, et,al (2013)

Business Performance (BP)

Kaplan & Norton (1996: 39), defines business performance as follows: *Balanced Scorecard is a method for the organization to systematically consider what it should do to develop an internally consistent and a comprehensive system of planning and control and a basis for understanding the difference between successful and unsuccessful organizations (Figure 1).*

Figure 1. Balance Scorecard



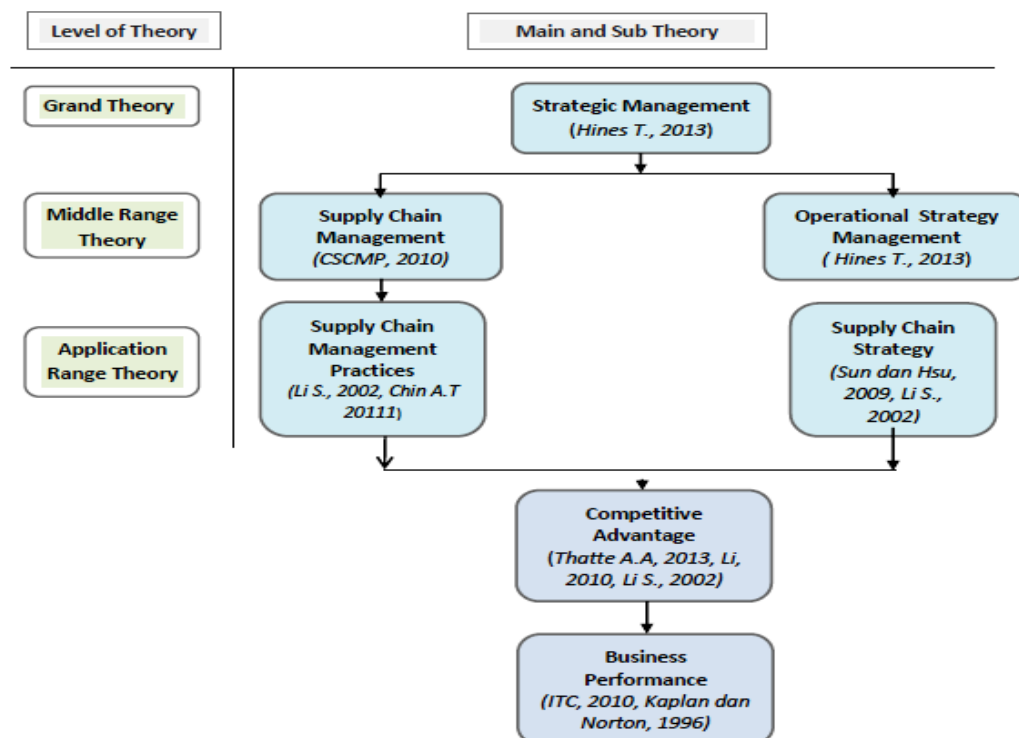
Source: Kaplan & Norton (1996)

The Balanced Scorecard is a performance measurement method that emphasizes on the financial side and the key performance indicators (KPI), which gives an indication of the company which relates to a more strategic objectives. *The Balance Scorecard* combines four perspectives. (Wisner J, Leong, and Tan K K., 2005).

Theoretical Framework

Companies that want to compete and produce a good performance need to ensure that the supply chain is managed effectively so as to excel among the competitors, it is inseparable from the determination of the right strategy with regard uncertain of environmental conditions so as to anticipate any changes well. Three management aspects / variables will affect a company excels among competitors in the industry, which will have an impact on overall business performance. Variables used in this study consisted of *independent* variables: *Supply Chain Management Practices and Supply Chain Strategy*, intervening variable: *Competitive Advantage* and dependent variable: *Business Performance*. The variables and its relationships as a new model of competitive advantage as shown in the diagram of framework (figure 2).

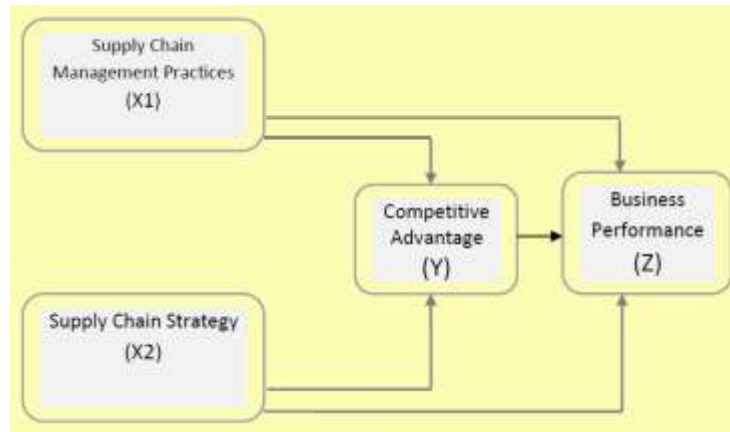
Figure 2. Theoretical Framework



Research Paradigm

Based on the theoretical framework above, research paradigm can be seen the following figure 3 below;

Figure 3. Research Paradigm



Hypotheses

1. Supply chain management and supply chain strategy influence the competitive advantage either partially or simultaneously.
2. Supply chain management and supply chain strategy and competitive advantage influence on business performance either partially or simultaneously.
3. Competitive advantage influences the business performance.

RESEARCH METHOD

Research Design

The research design used in this study consisted of descriptive research with a variable consisting of Supply Chain Management, Supply Chain Strategy, Competitive Advantage and Business Performance and verification study to determine the relationship between variables through hypothesis testing as well as testing the truth of the hypothesis through data collection in the field.

The Data

The subject of research / analysis unit in this study using a population of cacao processing industry spread throughout Indonesia and is registered in the Ministry of Industry totaled 17 large companies processing of cacao. The Research Unit / Unit Observation: Leaders / Managers.

Data Collection Techniques

The data collection techniques will be done by the research literature (source of data and information that is both qualitative and quantitative), and survey research or field trips (especially to farmers, traders, cacao factory, cacao exporters and associations (as respondent), a roundtable discussion / FGD (especially with relevant stakeholders).

Analytical Approach

Descriptive Analysis

Using descriptive of statistic methods and use an analysis tools SPSS for describing *variable that is;*

- Effective supply chain management is the key to success for competitive advantage of cacao business in Indonesia
- Companies in the cacao processing industry is able to determine the right supply chain strategy
- Competitive advantage the company was able to increasing the company's business performance

Verification Analysis

Based on the analysis unit cacao processing company with a population of 35 large enterprises and observation unit consists of 2 respondents, the head of the company; analysis in this study using structural equation model-based variant (*Structural Equation Model -SEM*) i.e. *Partial Least Square (PLS)* because:

- The goal to develop a theory /prediction orientation
- Unlimited number of population data
- Does not require a normal distribution analysis

Hypotheses Testing

Hypothesis 1: SCM and SCS influence the CA either partially or simultaneously.

Hypothesis 2: SCM and SCS influence the BP partially or simultaneously.

Hypothesis 3: CA influences the BP.

Hypotheses are tested using Structural Equation Model analysis..

EMPIRICAL RESULTS AND DISCUSSION

Base on the theoretical framework and supported by literature review previously, it has showed that the variables using in this research like supply chain management, supply chain strategy are able to be used as independent variable and competitive advantage as intervening variable and business performance as dependent variable.

Result of the descriptive analysis on Table 4 below show that all variables are effective, competitive and superior. Result of explanatory analysis shows that all variables are positive and significant.

Table 4. Summary Result of analysis

Analysis	Variable	Result
Descriptive		
	Supply Chain Management	Effective
	Supply Chain Strategy	Effective
	Competitive Advantage	Competitive
	Business Unit Performance	Superior
Explanatory		
Hypothesis 1.	Supply Chain Management, Supply Chain Strategy vs. Competitive Advantage	Positive and significant
Hypothesis 2.	Supply Chain Management, Supply Chain Strategy vs Business Performance	Negative/ Positive and significant
Hypothesis 3.	Competitive advantage vs Business Performance	Positive and significant

Test of Validity

Convergent validity of the measurement model with a reflexive indicators assessed based on the correlation between the score of item or component score with the score of the construct. The score is indicated by the results of the processing of *cross loading* as shown in Table 4. The table shows that all the components of the indicator have with the construct and correlation score more than 0.7 so that these components have a high measure of individual reflexive.

Table 5. Results of *Cross Loading* for Supply Chain Management, Supply Chain Strategy on the Performance of Business Unit through Competitive Advantage (using SmartPLS 3.2.4)

	BP	CA	SCM	SCS
BP1	0.934588	0.715299	0.721706	0.851777
BP2	0.938777	0.806397	0.802669	0.952492
BP3	0.944248	0.756756	0.805250	0.898094
BP4	0.907274	0.678057	0.711458	0.832771
CA1	0.535012	0.716110	0.666189	0.562278
CA2	0.705575	0.888742	0.795685	0.801524
CA3	0.756279	0.923359	0.834270	0.842241
CA4	0.597226	0.843175	0.769854	0.678332
CA5	0.800923	0.921723	0.893231	0.822299
SCM1	0.631227	0.841125	0.852260	0.685733
SCM2	0.619057	0.782754	0.856121	0.713110
SCM3	0.782119	0.800691	0.933402	0.791065
SCM4	0.787539	0.857496	0.914139	0.810671
SCM5	0.844661	0.864270	0.951806	0.882595
SCM6	0.749776	0.836889	0.894203	0.750987
SCS1	0.913615	0.781749	0.753138	0.947702
SCS2	0.804586	0.811970	0.781081	0.915009
SCS3	0.924099	0.816979	0.847592	0.914147

Table 5 show that the correlation between the of the dimensions and constructs i.e. Supply Chain Management (SCM), Supply Chain Strategy(SCS), Competitive Advantage (CA) and Business Performance (BP) show values greater than 0.70. This means that the indicators forming construct of SCM, SCS, CA and BP meets the convergent validity. Convergent validity was also indicated by the value AVE (*average variance extracted*) is more than 0.5 as shown in Table 6.

Table 6. PLS Quality Criteria

	AVE	Composite Reliability	R Square	Cronbachs Alpha	Communality
BP	0.867377	0.963174	0.634288	0.949057	0.867377
CA	0.743157	0.934861	0.875229	0.911346	0.743157
EU	0.652214	0.882031		0.827689	0.652214
SCM	0.811952	0.962774		0.953280	0.811952
SCS	0.857015	0.947302		0.916427	0.857015

The calculations show that the AVE is greater than 0.5, which means that the models are sufficient (Chin, 1998; Hack & Ringle, 2006: 15). In other words, the dimensions of the (SCM), (SCS), (CA) and (BP) meet the criteria of convergent validity. Discriminant validity of the measurement model with reflexive indicator can be seen as *cross loading* measurements to construct as shown in Table 5. The table shows that the components of the indicator to construct have score higher than the score of the indicator component to the other constructs. This means that each latent constructs predict the size of the blocks is better than the predicted size of the other.

Test of Reliability

To measure the reliability of models used *Composite Reliability* or *Cronbachs Alpha*. The purposes of *confirmatory* the model is considered reliable if the value of *composite reliabilities* of more than 0.7. Other experts reliability requires more than 0.8 (Daskalakis & Mantas, 2008: 288). Based on the results shown in Table 6, that the value of *Composite Reliability* and *Cronbachs Alpha* above 0.8, which means reliable for each construct required for *confirmatory* research.

Hypotheses Test Result

The result of first hypothesis test shows that variables (SCM) and (SCS) has a positive relationship and very significant on advantage competitive, meaning that together the variable of supply chain management, supply chain strategy and environmental uncertainty affecting the competitive advantage where the value $f_{count} > f_{table}$ (2.84) and Sig 0000 as shown in Table below.

Table 7. ANOVA ^a

Model	Sum of Squares	df	mean Square	F	Sig.
1 Regression	2894.281	2	964.760	69.157	.000 ^b
residual	432.461	31	13.950		
Total	3326.743	34			

a. Dependent Variable: CA

b. Predictors: (Constant), SCS, SCM

These results indicate that the application of supply chain management practices and supply chain strategy will increase the competitive advantage of the business units of cocoa processing industry in Indonesia.

The results of statistical calculations using SmartPLS software version 3.2.4 to test the first hypothesis about the effect of SCM and SCS on CA partially presented in Table below;

Table 8. Results Processing *Path Coefficient* for effect of SCM and SCS on CA

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (Sterr)	T Statistics (O / Sterr)
SCM -> CA	0.637615	0.600550	0.187014	0.187014	3.409454
SCS -> CA	0.284649	0.316087	0.160067	0.160067	1.778307

Effect practices of supply chain management (SCM) on competitive advantage (CA)

Results of testing the relationship between constructs shows that there is a significant and positive relationship of supply chain management (SCM) with a competitive advantage (CA) with coefficient 0.637 ($t_{\text{count}} > t_{\text{table}}$, Sig < 0.05), means 63.7% CA variable is affected by SCM, while the remaining 36.3% is influenced by other variables. It also supports previous research by Li S. et.al (2006), Li et.al (2005), Ferry Jie et.al (2013), Suharto R and Devie (2013) that supply chain management influence competitive advantage as positive and significant.

Effect of the supply chain strategy (SCS) on competitive advantage (CA)

There is a significant positive relationship of supply chain strategy (SCS) with a competitive advantage (CA) with the coefficient of 0.285 ($t_{\text{count}} > t_{\text{table}}$, Sig > 0.05), 28.5% variable CA is influenced by SCS, while the remaining 71.5% is influenced by other variables. It also supports previous research by Li S. et.al (2002), that the supply chain strategy positive and significant impact on competitive advantage but instead study by Sun and Hsu (2009), concluded that there is no significant effect.

The result of second hypothesis shows that supply chain management (SCM), supply chain strategy (SCS) together have a positive relationship and very significant with the business performance (BP) where the value $f_{\text{count}} > f_{\text{table}}$ (2.84) and Sig 0000 as shown in Table 9.

Table 9. ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	4569.668	2	1523.223	126.087	.000 ^a
Residual	374.504	31	12.081		
Total	4944.171	34			

a. Predictors: (Constant), SCS, SCM

b. Dependent Variable: BP

These results indicate that the application of supply chain management practices and supply chain strategy will increase the business performance of cacao processing industry in Indonesia.

The results of statistical calculations using SmartPLS software version 3.2.4 to test the second hypothesis about the effect of SCM and SCS on BP partially presented in Table below;

Table 10. Results Processing *Path Coefficient* for effect of SCM and SCS on BP

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (Sterr)	T Statistics (O / Sterr)
SCM -> BP	-0.164312	-0.154428	0.157145	0.157145	1.045610
SCS -> BP	0.931815	0.909689	0.124981	0.124981	7.455666

Effects of supply chain strategy (SCS) on the performance of the business unit (BP)

Results of testing the relationship between constructs Table 10 above shows that there is a significant and positive relationship between supply chain strategy (SCS) and business performance (BP) with the coefficient of 0.932, the value of $t_{\text{count}} > t_{\text{table}}$ (1.69) and significant at 0.05, meaning that 93.2% of business performance (BP) is influenced by the supply chain strategy (SCS), while the remaining 16.8% is influenced by other variables. It also supports previous research by Sun YS and Hsu, H. (2009) that supply chain strategy and significant positive effect on business performance.

Effect of supply chain management (SCM) on the business performance (BP)

Results of testing the relationship between the construct on Table 4.5 shows that there is a negative relationship and not significant between the supply chain management (SCM) and business performance (BP) with coefficient -0.164, $t_{\text{count}} < t_{\text{table}}$ (1.69) and significant at 0.05, meaning that 16.4% of business performance (BP) is negatively affected by the supply chain management (SCM), while the rest influenced by other variables. It does not support the results of previous studies by Suharto R and Devie (2013), Li S. et.al (2006) and Li et.al (2005) that the supply chain management as positive and significant impact on business performance. Thus it can be explained that the level of business performance significantly and positively influenced by the level of supply chain strategy and negatively affected by supply chain management.

The result of the third hypothesis show that Competitive Advantage (CA) affect to the Business Performance (BP). The results of statistical calculations using SmartPLS software

version 3.2.4 to test the third hypothesis about the effect of competitive advantage on the business performance show on Table below;

Table 11. Results Processing *Path Coefficient* for effect of CA on BP

	Original Sample (O)	Sample Mean (M)	Standard Deviation (STDEV)	Standard Error (Sterr)	T Statistics (O / Sterr)
CA -> BP	0.797953	0.802971	0.075690	0.075690	10.542351

The results show the relationship between the constructs. It turns out there is a positive and significant, which is a competitive advantage (CA) to business performance (BP) with the coefficient of 0.798, the value of $t_{\text{count}} > t_{\text{table}}$ (1.69) and significant at 0.05, meaning that 79.8% variable business performance (BP) affected positively and significantly by the competitive advantage (CA), while the remaining 20.2% is influenced by other variables. This strongly supports the results of a previous study by Ma Hao (1999), Thatte, A.A (2013), Robert Kaplan and David Norton (1996), Porter (1993) that the competitive advantage and significant positive effect on business performance.

Thus it can be explained that the level of business performance significantly and positively influenced by the level of competitive advantage. Analysis shows that this research result a new model which gave a big contribution on Indonesia cacao industry especially business performance indicators which is effected by its competitive advantage and driven by supply chain management and supply chain strategy.

Findings of this research are limited in terms of generalizability due to limited sample size and respondents' unresponsiveness. Hopefully this research can be continued with other variables, dimension and indicators which are relevant to the case especially in cacao manufacturing. Scope of the research need to be expand to another area or district or country to get more representative.

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