Strategic Management Accounting Information Usage and the Choice of Competitive Strategy: Moderating Role of Corporate Life Cycle

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ABSTRACT

This research investigated the moderating role of the corporate life cycle between Strategic Management Accounting (SMA) information usage and the choice of competitive strategies. The current research demonstrates that SMA information usage has a positive effect on the choice of competitive strategies by using partial least squares structural equation modelling (PLS-SEM) and comparing the difference in the relationship between SMA information usage and the choice of competitive strategy in different life cycle stages through partial least squares multigroup analysis (PLS-MGA). We found that compared with companies in the maturity stage, the product-related information usage by companies in the growth stage was helpful for the choice of differentiation strategy. In addition, compared with companies in the growth stage, companies in the maturity stage used product-related information and competitor-related information to help managers choose cost leadership strategies. This research clarifies the relationship among the corporate life cycle, SMA information usage and the choice of competitive strategy, provides managers with more accurate strategic decision-making suggestions, and provides a method for corporate life cycle research, that is, using PLS-MGA to compare path differences in variable relationships at different life cycle stages.

Keywords: SMA Information Usage, Competitive Strategy, Corporate Life Cycle, PLS-MGA

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INTRODUCTION

It has been more than 40 years since Strategic Management Accounting (SMA) was proposed by Simmonds (1981), and the research on SMA has gradually shifted from the conceptual framework of SMA (Bromwich, 1990; Lord, 1996; Shank, 1989; Ward, 1993; Langfield-Smith, 2008) to empirical research on SMA (Cadez & Guilding, 2008; Cinquini & Tenucci, 2010; Cravens & Guilding, 2001; Guilding & Mcmanus, 2002; Guilding, Cravens and Tayles, 2000). Most previous research has revolved around the question of whether SMA practices can positively impact firm performance (Noordin, Zainuddin, Mail and Sariman, 2015; Cadez & Guilding, 2008; Turner, Way, Hodari and Witternan, 2017; Alamri, 2019; Oboh & Ajibolade, 2017; Pasch, 2019; Oyewo, 2022). Although most of the studies confirm the positive effect of SMA on firm performance, they expect SMA practices to have great potential to help managers cope with increasing competition and uncertainty environments (Tillmann, 2003). However, SMA has maintained a low implementation rate to date (Hadid and Al-Sayed, 2021). The possible reason for this is that most studies only focus on one or two SMA practices, such as customer accounting (Guilding and McManus, 2002), strategic costing (Henri, Boiral and Roy, 2016), life cycle costing (Dunk, 2004), and strategy (Cadez & Guilding, 2012).

The current research tried to investigate whether SMA information usage is helpful for the choice of competitive strategy. We refer to the type of competitive strategy proposed by Porter (1980) rather than the strategic framework of Miles and Snow (1986), which was referred to in previous studies (Cadez & Guilding, 2012). The current research is the same as previous research, selecting differentiation strategy and cost leadership strategy as research objects (Hadid and Al-Sayed, 2021) and investigating the relationship between different dimensions of SMA information usage and the choice of these two types of competitive strategies.

Considering that the state of a company is not static and that companies have different characteristics in different life cycle stages (Miller and Friensen, 1984), and in different life cycle stages, companies will use different dimensions of SMA information (Pasch, 2019) and choose a competitive strategy (Lester, Parnell, Crandall and Menefee, 2008; Azuzair and Langfield-Smith, 2005). According to the interpretation of

the contingency theory, in different life cycle stages, there should be the matching of SMA information usage and the choice of competitive strategy (Schoonhoven, 1981; Donaldson, 2001). The current research compared the relationship between SMA information usage and the choice of competitive strategy by companies in the growth and maturity stages in which most companies concentrated (Azuzair and Langfield-Smith, 2005).

The data of the current research came from manufacturing companies in China. We selected manufacturing companies in the Beijing-Tianjin-Hebei region as the research object and investigated the positive relationship between SMA information usage and the choice of competitive strategy through PLS-SEM. The current research chose PLS-MGA to investigate the moderating effect of the corporate life cycle.

The current research demonstrates the powerful role of SMA in Chinese manufacturing companies and that managers need to recognize the powerful technology of SMA. In addition, this research investigated the relationship between SMA information usage and the choice of competitive strategy in the growth and maturity stages and provides reasonable advice for managers' information usage and competitive strategy choice in different life cycle stages. Finally, this research provides a new model for corporate life cycle research, that is, using PLS-MGA to conduct group research on companies in different corporate life cycle stages to compare the differences in the relationship between the independent variables and dependent variables in different groups.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Strategic Management Accounting Information Elements

SMA was first proposed by Simmonds (1981), who believed that it could provide managers with their own information and management accounting data of competitors and help managers formulate and monitor company strategies. Tillmann (2003) described SMA as being about the use of management accounting systems in supporting strategic decision-making. Guilding et al. (2000) believed that customer accounting was also included

in the content of SMA and considered SMA to be strategically oriented management accounting technology and proposed 12 SMA practices, which were simplified into five dimensions in subsequent research (Cadez & Guilding, 2012).

Noordin et al. (2015) proposed the concept of SMA information elements based on 12 SMA practices provided by Guilding et al. (2000) and divided SMA information elements into three dimensions, namely, competitor-related information, customer-related information, and product-related information. The current research selected the conceptual model of SMA information elements of Noordin et al. (2015) to investigate SMA information usage in Chinese manufacturing companies.

Competitive Strategy

Porter's (1980) competitive strategy includes differentiation strategy, cost leadership strategy and focus strategy. Most of the research focuses on differentiation strategy and cost leadership strategy because focus strategy can be implemented simultaneously with differentiation strategy and cost leadership strategy (Duanmu, Bu and Pittman, 2018; Yan and Liu, 2017; Shi, 2019; Chen and Liu, 2019). The differentiation strategy does not pay much attention to cost control, and its main purpose is to form the difference of products and services to obtain benefits higher than the market average profit. The main content of the cost leadership strategy is to require companies to actively build large-scale and efficient facilities, actively reduce costs through experience, strictly control costs and management expenses, avoid secondary customers, and focus on areas such as R&D, service, sales team management and minimization of costs in areas such as advertising (Porter, 1980). The current research selected Porter's (1980) competitive strategy framework to investigate the relationship between SMA information usage and the choice of competitive strategy.

Corporate Life Cycle

The corporate life cycle refers to the whole process from the birth to the death of a company (Miller and Friensen, 1984). Adizes (1979) believes that all living objects and even companies on Earth follow the life cycle phenomenon. Previous studies have divided the corporate life cycle into three

stages (Downs, 1967; Lippitt and Schmidt, 1967), four stages (Kazanjian and Drazin, 1990) and five stages (Miller and Friensen, 1984). Among them, the five-stage model from Miller and Friensen (1984) is widely used (Hasan & Habib, 2017; Hasan et al., 2015; Auzair and Langfield-Smith, 2005). The five stages include introduction, growth, maturity, revival, and decline. Miller and Friensen (1984) summed up the characteristics of companies in each life cycle stage, among which the companies in the growth, maturity and revival periods have relatively complete organizational structures and information systems, so managers in these stages have more opportunities to collect and use SMA information. In addition, most previous studies have focused on the growth stage and the maturity stage, since most companies are concentrated in these two stages (Auzair and Langfield-Smith, 2005; Dickinson, 2011).

Hypothesis Development

SMA Information Usage and The Choice of Competitive Strategy

SMA has external, long-term, and strategic characteristics (Guilding et al., 2000), and the main purpose of SMA is to give managers relevant information about products, competitors, and customers to help managers make strategic decisions. Therefore, most of the empirical studies on SMA are related to strategy (Cadez and Guilding, 2008; Abdul-Kader & Luther, 2006; Cinquini & Tenucci, 2010; Turner et al., 2017; Oboh et al., 2017; Cescon, 2019), but few studies focused on the relationship between SMA information usage and Porter's competitive strategy. Cescon (2019) believes that companies choose the cost leadership strategy more need for strategic cost accounting information and internal and external financial information of products. In addition, cost leadership strategy needs to establish a cost advantage, the establishment of a cost advantage needs to be compared with competitors, the cost structure of competitors, the strategic pricing of competitors, and the financial status of competitors and other information (Porter,1980). However, while establishing cost advantages, companies still need to pay attention to information such as product quality and do not need to pay more attention to interactions with customers (Cescon, 2019). Therefore, the current research proposed the following hypotheses:

H1: Product-related information usage has a positive relationship with the choice of cost leadership strategy.

H2: Competitor-related information usage has a positive relationship with the choice of cost leadership strategy.

Managers who choose a differentiation strategy need more information on customer demand for products, product quality, customer service needs, and brand strength (Cescon, 2019). In other words, product-related information and customer-related information are very helpful to the choice of differentiation strategy. According to Porter (1980), differentiation is mainly caused by the large difference between its own products and most similar products in the market, and these differences may be products or services that customers consider unique. Therefore, the current research hypothesizes the following:

H3: Product-related information usage has a positive relationship with the selection of a differentiation strategy.

H4: Customer-related information usage has a positive relationship with the choice of differentiation strategy.

Moderation Effect of the Corporate Life Cycle

The life cycle stage of the company is different, and the strategy, structure, environment, and decision-making style of the company are also quite different (Miller and Friesen, 1984). In the growth stage, the company develops rapidly but the product fluctuation is small. In addition, the creative of the company is still strong (Miller and Friesen, 1984; Hasan et al.,2015). According to the characteristics of companies in the growth stage, companies already have the ability to obtain and use SMA information, and compared with the introduction period, as the management of companies becomes more standardized, decision makers need to obtain SMA information to help decision-making, especially the need for product relevant information and customer-related information (Pasch, 2019). For companies in the maturity stage, the company develops slowly and is less creative compared with growth stage. However, the company products are gradually diversified. In addition, company structure is more formal, and the internal management system of the company is gradually improved,

managers pay more attention to the control of the internal structure and products of the company (Miller and Friesen, 1984), and the company places more emphasis on the improvement of profitability. Companies obtain a competitive advantage through cost accounting and efficiency improvement. Therefore, companies in the maturity stage need SMA information more than those in the growth stage and pay more attention to product-related costs to help managers in cost control (Pasch, 2019).

In addition, in different corporate life cycle stages, to cope with the continuous changes in the external environment, companies choose appropriate competitive strategies according to their own characteristics in different life cycle stages (Kazanjian, 1988). For the competitive strategy model proposed by Porter (1980), differentiation strategy focuses on forming product or service differences, while cost leadership strategy focuses on product cost control. Then, in the growth stage, companies need to provide new products to increase market heterogeneity and pay more attention to product innovation and quality improvement to obtain stable customers (Miller and Friesen, 1984).

Therefore, companies in the growth stage are more suitable for the differentiation strategy, and this conclusion has been confirmed by previous studies (Chen and Hsieh, 2005; Lester et al., 2003). For companies in the maturity stage, since company managers pay more attention to the improvement of profitability, they will focus on cost control and efficiency improvement (Miller and Friesen, 1984). For companies in the maturity stage, their products already have stable customers in the market, so it may be more suitable to choose a cost leadership strategy to ensure existing cost advantages and establish price barriers to prevent new competitors from entering. However, while controlling costs, the market competition of companies in the maturity stage is higher than that of companies in the growth stage. Most companies in the maturity stage need to always pay attention to the information of their competitors to gain an understanding of the current situation of their competitors and ensure their products' profitability and cost advantages. Therefore, company managers in the maturity stage also need competitor-related information.

In summary, according to the most of previous studies, the company in growth are more suitable to choose differentiation strategy (Chen and

Hsieh, 2005; Lester et al., 2003), but the company in maturity needs to choose cost leadership strategy (Cescon, 2019). However, Gan and Wang (2014) believed that companies in the growth stage may also choose the cost leadership strategy to gain competitive advantage. Therefore, it is necessary to balance SMA information usage and the choice of competitive strategies between companies in the growth stage and those in the maturity stage. The relationship between them can be compared to provide more accurate suggestions for managers. This research hypothesized the following:

H5: The relationship between customer-related information usage and the choice of differentiation strategy is significantly stronger for the growth stage than for the maturity stage.

H6: The relationship between product-related information usage and the choice of differentiation strategy is significantly stronger for the growth stage than for the maturity stage.

H7: The relationship between product-related information usage and the choice of cost-leadership strategy is significantly higher for the maturity stage than for the growth stage.

H8: The relationship between competitor-related information usage and the choice of cost-leadership strategy is significantly higher for the maturity stage than for the growth stage.

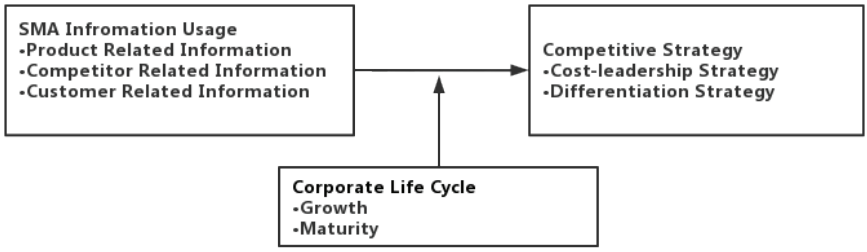

Figure 1: The Research Models

Research Methods

Sample and data collection

In this research, a questionnaire was used to collect the data required for the research. The object of the questionnaire is China's manufacturing companies. Since there may be differences between different provinces in China due to different local policies, this research mainly focussed on manufacturing companies above a designated size in the Beijing-Tianjin-Hebei region of China (see http//data.stats.gov.cn). In this research, questionnaires were distributed to accountants, CEOs or CFOs of 900 manufacturing companies in a simple random sampling through email and online surveys. A total of 539 responses were received, excluding companies in other life cycle stages, 328 responses are usable (in growth stage and maturity stage). Because the current research uses PLS-MGA to test the moderation effect of the corporate life cycle, Hair et al. (2017) proposed that unequal sample sizes across the moderator-based subgroups would decrease statistical power and lead to the underestimation of moderating effects. Since we got only 150 responses from the growth stage companies and in order to balance the number of each group, all the 150 companies in the growth stage were selected and 150 companies in the mature stage were randomly selected as the research objects of this research.

Most sample companies only focussed on the local market, and company sales were mostly less than 5 million RMB per year. Most of the respondents to the questionnaire were company accountants, CEOs and CFOs accounting for only 9.7% and 5.7%, respectively. However, there were 11.3% of respondents from other positions in the company. Most of the respondents had worked in the company for more than 2 years. It can be considered that they had a certain understanding of the company's strategy and were able to complete the questionnaire items well (Table 1).

Table 1: Profile of the Response

Demographic Profile	Categories	Frequency	Percentage
Industry name	Energy Processing Industry	42	14.0%
	Energy Manufacturing	63	21.0%
	Material Processing Industry	83	27.7%
	Material Manufacturing	70	23.3%
	Equipment manufacturing	42	14.0%
Focus on	Local market only	181	60.3%
	Export market only	37	12.3%
	Both local and export market	82	27.3%
Average annual sales over the last three years were (approximates ONLY)	Less than RMB 5 mil	157	52.3%
	RMB 5 mil – RMB 50 mil	92	30.7%
	RMB 50 mil and above	51	17.0%
Position in the company	Accountant	220	73.3%
	CEO	29	9.7%
	CFO	17	5.7%
	Others	34	11.3%
Present position time	Less than two years	81	27.0%
	2 - 4 years	138	46.0%
	5 - 7 years	63	21.0%
	More than 7 years	18	6.0%

Measures

The dependent variable of this research, a 6-item scale, was used to measure the choice of differentiation strategy (Morgan et al, 2004; Panwar et al, 2016; Zheng and Li, 2011), a 4-item scale was used to measure the choice of cost leadership strategy (Morgan et al, 2004; Panwar et al, 2016;

Zheng and Li, 2011), and a Likert-7 scale was used (1 means not stressed at all, 7 means very stressed).

The independent variable of this research was SMA information usage, including product-related information usage, Competitor-related information usage, and Customer-related information usage. We used an 8-item scale to measure product-related information usage, a 5-item scale to measure competitor-related information usage, and an 8-item scale to measure customer-related information usage (Guilding et al., 2000; Guilding and McManus, 2002). All items were also measured using the Likert-7 scale (1 for Not used at all, 7 for Greatly used).

The moderating variable of this research was the corporate life cycle. The Miller and Friesen (1984) 5-stage self-assessment scale, which is widely used in previous studies, was used to judge the life cycle stage of a company.

Data analysis

PLS-SEM was implemented to analyze the resulting data and contrast the hypotheses. It was clear that all variables in the research were reflective variables (Hair, Hult, Ringle, & Sarstedt, 2017), and the reliability and validity of the structure were verified using Smart PLS3. Before PLS-MGA, measurement invariance of composite models (MICOM) was used to detect the invariance of variables, and it was clear that the corporate life cycle can be used as a moderating variable between the independent variable and the dependent variable in the model, that is, there was full invariance (Henseler et al., 2016). This guaranteed that this research can perform PLS-MGA and test the hypotheses.

RESULTS

Measurement Model Assessment

This research used PLS-SEM to conduct this research. It can be confirmed that all latent variables in this research belonged to reflective variables, and the measurement model assessment of reflective variables includes the reliability (CR) of latent variables convergent validity (AVE), discriminant validity (HTMT), and collinearity (VIF) (Hair et al., 2017).

First, this research measured the reliability and convergent validity of the measurement model (Table 2). The measurement model reliability (CR) of all data sets exceeded the recommended threshold of 0.7. In addition, all item loadings exceed the recommended 0.707. The convergent validity of the model was assessed by item loading, composite reliability for each scale, and mean variance extracted for each construct (AVE). The recommended value of AVE was 0.5, and we found that the value of AVE was higher than 0.5 in all sample groups (Hair et al., 2017).

Table 2: PLS Factor Loadings, CR and AVE of total and Life Cycle Stage Samples

	Total Sample			Growth			Maturity		
	Loadings	CR	AVE	Loadings	CR	AVE	Loadings	CR	AVE
COST*		0.935	0.783		0.944	0.809		0.927	0.761
COST1	0.88			0.913			0.85		
COST2	0.886			0.887			0.89		
COST3	0.891			0.938			0.836		
COST4	0.882			0.857			0.911		
DIFF*		0.942	0.732		0.941	0.727		0.944	0.738
DIFF1	0.829			0.816			0.841		
DIFF2	0.879			0.869			0.889		
DIFF3	0.768			0.754			0.781		
DIFF4	0.906			0.898			0.914		
DIFF5	0.901			0.924			0.877		
DIFF6	0.842			0.841			0.846		
COM*		0.926	0.715		0.911	0.673		0.942	0.764
COM1	0.829			0.799			0.854		
COM2	0.866			0.831			0.905		
COM3	0.876			0.839			0.921		
COM4	0.831			0.807			0.86		
COM5	0.824			0.825			0.826		
CUS*		0.941	0.666		0.945	0.684		0.936	0.647
CUS1	0.802			0.794			0.814		
CUS2	0.822			0.82			0.829		

CUS3	0.846			0.832			0.862			
CUS4	0.813			0.825			0.796			
CUS5	0.834			0.831			0.837			
CUS6	0.762			0.785			0.734			
CUS7	0.82			0.872			0.757			
CUS8	0.826			0.854			0.797			
PRO*		0.951	0.71		0.955	0.725		0.948	0.694	
PRO1	0.844			0.876			0.81			
PRO2	0.827			0.831			0.824			
PRO3	0.844			0.84			0.852			
PRO4	0.817			0.816			0.816			
PRO5	0.868			0.878			0.854			
PRO6	0.825			0.826			0.822			
PRO7	0.847			0.881			0.81			
PRO8	0.866			0.86			0.874			

*COST=the choice of cost-leadership strategy; DIFF=the choice of differentiation strategy; COM=competitor-related information usage; CUS=customer-related information usage; PRO=product-related information usage

For the test of discriminant validity, this research accepted the suggestion of Henseler et al. (2016) and chose the HTMT method. The value of HTMT was higher than 0.9, indicating a lack of discrimination between indicators. If there is a more conceptually different structure in the model, it is necessary to reduce the threshold of HTMT to a more conservative position, generally 0.85 (Henseler et al., 2016). Table 3 shows the HTMT value among the total sample group, the growth stage group and the maturity stage group.

Table 3: HTMT of Total and Life Cycle Samples

	Total Sample				Growth				Maturity			
	COM	**COST**	**CUS**	**DIF**	**COM**	**COST**	**CUS**	**DIF**	**COM**	**COST**	**CUS**	**DIF**
COST	0.431				0.256				0.616			
CUS	0.241	0.4			0.19	0.358			0.292	0.445		
DIF	0.284	0.472	0.55		0.265	0.453	0.649		0.298	0.492	0.435	
PRO	0.166	0.469	0.398	0.52	0.154	0.372	0.397	0.641	0.174	0.581	0.395	0.372

This research found that in the three groups, the HTMT values between the latent variables did not exceed the conservative threshold of 0.85, so the variables in the measurement model were considered to have discriminant validity. To measure the collinearity of each latent variable in the measurement model, this research used the variance inflation factor (VIF) to measure the collinearity of the model according to the interpretation of Hair et al. (2017). When the VIF value is less than 5, it can be considered that there is no collinearity between the two indicators. The VIF value of all indicators in this research did not exceed 5 (Table 4), so there was no collinearity problem.

Table 4: VIFs of the Total and Life Cycle Samples

	Total Sample		Growth		Maturity	
	COST	DIF	COST	DIF	COST	DIF
COM	1.059	1.059	1.036	1.036	1.088	1.088
CUS	1.199	1.199	1.18	1.18	1.222	1.222
PRO	1.167	1.167	1.17	1.17	1.159	1.159

Structural Model Assessment

We tested the structural model, and by using R2 to demonstrate the explanatory power of the research, we found that the model explained 31.7% of the cost-leadership and 37.6% of the differentiation, which is a weak predictor (Henseler et al., 2014). Through the significance investigation of the path coefficient, we found that product-related information usage had a positive and positive impact on the choice of cost leadership strategy and differentiation strategy, and the effect size of the path was tested to find that product-related information usage had a significant impact on the choice of cost leadership strategy has a small effect ($f2=0.129<0.15$) and the choice of differentiation strategy has a medium effect ($f2=0.156>0.15$). Competitor-related information usage had a positive effect on the cost leadership strategy, but its effect was small. In addition, customer-related information usage had a positive and positive impact on the differentiation strategy, and there was a moderate impact ($f2=0.175>0.15$). Therefore, the H1-4 hypotheses of this research were all supported.

Table 5: Test Results of Structural Models

	β	t Value	f^2	Hypothesis test
PRO -> COST	0.319**	6.681	0.129	H1 Supported
COM -> COST	0.3**	5.781	0.126	H2 Supported
PRO -> DIF	0.335**	7.102	0.156	H3 Supported
CUS -> DIF	0.36**	7.427	0.175	H4 Supported

P value<0.05, 0.01** One-tailed*

The Result of PLS-MGA

Before conducting PLS-MGA, we needed to measure the invariance of items. Only when there was complete invariance of the items in the growth period group and the maturity period group can we test the moderating effect. At the same time, this research also tested the fitting value (SRMR) of the two groups of models and found that the fitting values of the growth and maturity models were 0.051 and 0.054, both lower than 0.08, which could be accepted by PLS-SEM (Henseler et al., 2016), tested the explanation degree R2 of the two models, and found that the explanation degree of the cost leadership strategy in the growth stage was the lowest (R2=0.197), but it also met the minimum requirements provided by Cohen (1988), and the end of the rest of the models all satisfied the moderate model explanation level (R2>0.33).

The test of item invariance was divided into three steps. In the first step, since the data of the two groups came from the same questionnaire items, the configuration invariance was proved. The second step through 5000 permutations examined component invariance using one-tailed testing. The third step also passed 5000 permutations, and the significance threshold (p value) was determined to be 0.05. It was found that the mean and variance of each variable were not significantly different. Therefore, it can be confirmed that there was no difference in the mean and variance of each variable between the two groups, and it can be confirmed that all variables had established full measurement invariance (Table 6).

Table 6: MICOM Assessment (Growth-Maturity)

Step 1and 2		Compositional Invariance (Correlation =1)		
Constructs	Configural Invariance (Same Algorithms for Both Groups)	C=1	Confidence Interval	Partial Measurement Invariance Established
COM	Yes	1.000	[0.996,1.000]	Yes
COST	Yes	0.999	[0.999,1.000]	Yes
CUS	Yes	0.999	[0.998,1.000]	Yes
DIF	Yes	1.000	[0.999,1.000]	Yes
PRO	Yes	1.000	[0.999,1.000]	Yes

Stept3	Equal Mean Assessment				Equal variance assessment			
Constructs	Differences	Confidence Interval	Permutation p Values	Equal	Differences	Confidence Interval	Permutation p Values	Equal
COM	0.132	[-0.189,0.196]	0.132	Yes	-0.009	[-0.241,0.234]	0.484	Yes
COST	0.069	[-0.193,0.193]	0.276	Yes	0.169	[-0.223,0.228]	0.107	Yes
CUS	0.103	[-0.191,0.183]	0.181	Yes	0.091	[-0.234,0.246]	0.267	Yes
DIF	0.117	[-0.184,0.187]	0.160	Yes	0.123	[-0.229,0.231]	0.194	Yes
PRO	0.142	[-0.193,0.188]	0.108	Yes	0.168	[-0.229,0.229]	0.112	Yes

Therefore, this research could conduct PLS-MGA to compare the difference in the relationship between SMA information usage and competitive strategy choice in the two groups. As suggested by Henseler et al. (2016), a difference p value of path coefficients between the two groups below 0.05 or above 0.95 indicates a significant difference between the path coefficients of the two groups.

Table 7: Results of Hypothesis Testing

Hypothesis	Relationships	Path Coefficients Original		Confidence Interval (95%)		Path Coefficient Difference	P Value Difference (One-Tailed)	Supported
		Growth	Maturity	Growth	Maturity			
H5	CUS -> DIF	0.429**	0.286*	[0.326,0.521]	[0.152,0.403]	0.143	0.069	No
H6	PRO -> DIF	0.429**	0.223**	[0.325,0.522]	[0.091,0.336]	0.206	0.014	Yes
H7	PRO -> COST	0.244**	0.411**	[0.116,0.359]	[0.314,0.498]	-0.167	0.965	Yes
H8	COM -> COST	0.159**	0.458**	[0.022,0.284]	[0.348,0.553]	-0.299	0.998	Yes

Note: In Henseler's MGA method, a p value lower than 0.05 or higher than 0.95 indicates significant differences between specific path coefficients across two groups at the 5% level.
*p < 0.05, **p < 0.01

As shown in Table 7, we found that compared with companies in the maturity stage, product-related information usage by companies in the growth stage was more helpful for the choice of differentiation strategies (path difference=0.206, $p<0.05$). Compared with the companies in the growth stage, product-related information usage and competitors-related information usage had a positive impact on the choice of cost leadership strategy in maturity stage companies (path difference=-0.167, $p>0.95$; path difference=-0.299, $p>0.95$). However, the relationship between customer information usage and the choice of differentiated strategies did not show significant differences between the two groups.

DISCUSSION AND CONCLUSION

Through the data analysis of Chinese manufacturing companies, this research found that SMA information usage had a positive impact on the choice of competitive strategy, in which product-related information usage can help managers understand the differences between products and most products in the market through the information of product quality, product development, and product innovation to choose a differentiation strategy. In addition, understanding the product cost information and the product pricing information can better maintain the existing low-cost advantage, reasonably control the profit margin, and help the choice of cost leadership strategy. Customer-related information includes customer satisfaction, customer acquisition rate, customer income forecast and other information, and this information is of great significance to the selection of differentiation warfare, which can help managers fully understand product market demand and help managers clarify product advantages to locate target customers to gain a competitive advantage. Competitor-related information is of great help to the choice of cost leadership strategy, which reduces product costs by establishing economies of scale and high-efficiency production lines to obtain lower costs than competitors and thus obtain lower price advantages. Then, the financial status and cost structure of competitors can help managers better understand their own cost advantages and formulate appropriate pricing strategies according to the specific conditions of competitors to obtain competitive advantages. This conclusion is also in line with previous studies discussing the relationship between SMA and competitive strategy (Cescon, 2019).

This research further investigated the differences in the relationship between SMA information usage and the choice of competitive strategies at different life cycle stages. Previous research has shown that companies use SMA information more frequently from the introduction period to the maturity period (Pasch, 2019). In addition, companies in both the growth and maturity stages may choose differentiation strategies and cost leadership strategies (Millerh and Friesen, 1984; Chen and Hsieh, 2005; Gan and Wang, 2014; Lester et al., 2003; 2008). This research found that compared with companies in the maturity stage, product-related information usage in the growth stage had a more positive effect on the selection of differentiation strategies. The main reason is that the companies in the growth stage are still in a highly developed state and have a lower market share in the entire industry, so it attracted customers through product differentiation to obtain a relatively stable customer group. For customer-related information, since the selection of differentiated strategies in both the growth stage and the maturity stage requires attention to customer-related information, this research did not find a difference in the relationship between customer-related information usage and the choice of differentiated strategies in these two stages.

Companies in the maturity stage already have a larger market share, so most managers of maturity companies choose the cost leadership strategy to expand their competitive advantages. This research found that compared with companies in the growth stage, product-related information usage and competitor-related information by companies in the maturity stage are more conducive to the choice of cost leadership strategies. The main reason is that cost leadership strategies mainly focus on whether the product cost is lower than the competitor's product, and managers need to better understand the cost structure of their own products and the cost structure of competitors' products.

CONTRIBUTIONS AND LIMITATIONS

The results of the current research demonstrate the powerful role of SMA in Chinese manufacturing companies and demonstrate the importance of using SMA information in companies' strategic decision-making process. The current research first analysed the relationship between SMA information usage and the choice of competitive strategy, improves the confidence of

company managers in using SMA information, and explains to company managers the classification of the content of SMA information and the specificity of each dimension. This research provides help for managers to use SMA and collect SMA information. Second, this research investigated the relationship between SMA information usage and competitive strategy choices of companies in the growth and maturity stages and provides reasonable advice for managers' information usage and competitive strategy choice in different life cycle stages. Finally, this research provides a new model for corporate life cycle research, that is, using PLS-MGA to conduct group research on companies in different corporate life cycle stages to compare the differences in the relationship between independent variables and dependent variables in different groups.

There are some limitations in current research. Firstly, it investigated the relationship between SMA information usage and the choice of competitive strategic. However, like most studies, it ignored the focus strategy and only used the differentiation strategy and cost leadership strategy as the research object. Secondly, the research investigated the relationship between SMA information usage and the choice of competitive strategy for companies in the growth and maturity stages and provides recommendations for companies in the growth and maturity stages. However, the research did not investigate the relationship between SMA information usage and the choice of competitive strategy in the introduction, revival, and decline periods.

For future research, the sample selection could be expanded to include all life cycle stages to compare SMA information usage in different life cycle stages in relation to competitive strategy choice. Because according to the suggestion of Hair et al. (2017), when there are more than two groups, the omnibus test of group (OTG) differences can be used. This technology will also be implemented by Smart PLS in the near future, which can make future investigations easier.

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