

Customer Relationship Management and Customer Loyalty Affecting Business Performance of the Steel Manufacturers in Bangkok Metropolitan Area

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Abstract:

The purposes of this research are 1) to study the personal characteristics of the executives in the steel industry, 2) to study the factors and the direct effects of customer relationship management and customer loyalty on business performance of the steel industry, 3) to study the indirect effect of customer relationship management affecting business performance, and 4) to propose the customer relationship management guidelines for entrepreneurship of steel industry in new economy. For composing research conceptual framework to study the relationship between the different variables, the literature, many related theories and researches were reviewed. The samples were 320 respondents, who were experienced chief executives of steel manufacturers in Thailand Iron and Steel Industry Club, the Federation of Thai Industries, located in Bangkok metropolitan area. Data was collected using in-depth interview and questionnaire with greater than 0.80 validity and reliability. The results portrayed that (1) the causal structural equation model that has been modified was fit to the empirical data in acceptable criteria of fit indices: $\chi^2 = 51.98$ $df = 34$ $p\text{-value} = .02491$, $\chi^2 / df = 1.52$, $RMSEA = .041$, $RMR = .009$, $SRMR = .027$, $CFI = 1.00$, $GFI = .97$, $AGFI = .94$, $CN = 345.61$ and (2) the customer relationship management had a direct effect on customer loyalty and business performance. Moreover, customer relationship management also had an indirect effect on the business performance by mediation effect of customer loyalty of steel manufacturing entrepreneurs.

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I. STATEMENT AND SIGNIFICANCE OF THE PROBLEM

Industrial business or manufacturing business is very important to the national economy (Hotrawaisaya & Jermstiparsert, 2020; Wisedsin, Jermstiparsert, Thitart, & Aunyawong, 2020). In the past, it was found that such business had the highest value in the country, accounting for 34 percent of the country's gross domestic product (Bank of Thailand, 2019). The Thai iron and steel industry is one of the basic industries that are important to the country's

economic development since it is an industry linked to many important industries of the country. Thailand has a high potential steel market because the demand for steel in the country tends to expand according to the growth of various industries, especially the automotive industry and other part manufacturing industries (Office of Industrial Economics, 2019).

Due to economic events affecting the steel industry in Thailand, these result in increased domestic competition since there are more business competitors from foreign countries coming into the market. This causes the domestic steel manufacturers

to face high capital investment and rely on the import of raw materials, technology, and production equipment in order to compete in the increasingly competitive world market. The steel manufacturers, therefore, have to find a way to survive in this economic crisis. Establishing customer relationship is an important guideline in marketing operations because building long-term customers allows a company to reduce costs for public relations to find new customers and to use costs from this part to maintain the existing customers. The company, consequently, has a higher business growth rate, can create business opportunities (Phrapratanporn and Wangkananon, 2015), increases profits, and generates a

competitive advantage (Auka, 2012). Past studies found that activities in customer relationship management can enhance the business performance whether sharing information such as marketing, production plan, product information or events that may affect the company's operations (Song and Liao, 2019). For that reason, if steel manufacturers build customer relationship, they can adapt themselves to the situations of free trade competition and the trend of modern economy, as conceptualized by Lovelock and Wirtz's loyalty wheel concept (2007).

The researchers were therefore interested to study the model of customer relationship management of steel manufacturers for growth in the new economic era of Thailand using mixed method research. Data was collected from Thailand steel manufacturers' executives as suitable samples because they were able to reflect the information of the company well. The research results were expected to be a guideline for the steel manufacturers in Thailand in surviving their businesses in free trade competition crisis and new economic era, including a way for the government to adopt the policy to help Thailand steel industry to be sustainable in the future. When the steel manufacturing industry is competitive, it will contribute to the economic development of Thailand manufacturing sector and lead the country to Thailand 4.0.

The researchers were interested in the answers to these questions: 1) How are Personal data of steel manufacturing firms' executives, CRM, LOY, and BUPER of the steel manufacturers in Thailand?, 2) What are factors of CRM, LOY, and BUPER? And how does CRM directly affect LOY and BUPER of steel manufacturers in Thailand?, 3) How does LOY mediate the effect of CRM on BUPER of the steel manufacturers in Thailand?, and 4) What are guidelines for steel manufacturers' CRM for growth in Thailand?. The objectives of the research are to survey the personal characteristics executives of steel manufacturing firms in Thailand, including Thailand steel manufacturers' CRM, LOY, and BUPER, to study the factors of CRM, LOY, and BUPER, plus the direct effect of CRM on LOY and BUPER of steel manufacturers in Thailand, to study the indirect effect of CRM on BUPER of steel manufacturers in Thailand by the mediation effect of Thailand steel manufacturers' LOY, and to provide steel manufacturers in Thailand with guidelines for CRM in the new economy era.

II. RELATED LITERATURE AND STUDY

1. The effect of CRM on LOY

Hassen and Abouaish (2018) reveal that CRM based on socially conscious marketing affect customer intentions in changing service providers. Such study depicts that the strategic and tactical causes differ in the following dimensions: the company causal consistency, duration, resources invested, and chief executive participation. Pozza et al. (2018), besides, show that when comparing other important CRM activities after implementing the organization's orientation activities, CRM has a negative impact on LOY. Santouridis and Tsachtani (2015), moreover, display that CRM organization resources are the most important factors influencing LOY. In addition, Garrido-Moreno et al. (2014) state that CRM has become one of the most influential technologies in the world to create LOY.

2. The effect of CRM on BUPER

Kubina and Lendel (2015) portray the problem of failure in implementing social CRM in the company, especially in practical marketing management. Successful companies often try to assure competitive advantage by customer relationship (Josiassen et al., 2014). Consistently, CRM has a positive influence on the success of companies (Jarfarpour and Ardakadi, 2017). CRM, in addition, has a positive impact on financial service providers' performance (Wongsansukcharoen et al., 2013) and businesses' information usage performance (Sebjan et al., 2014).

3. The effect of LOY on BUPER

CRM can create LOY and then LOY leads to BUPER, as concluded by Wang and Feng (2012), Ghasemi et al. (2017) and Ghazian et al. (2016).

Research Hypotheses

From the review of related studies, the study therefore proposes the following hypotheses.

H1: CRM has a direct effect on LOY of steel manufacturers.

H2: CRM has a direct effect on BUPER of steel manufacturers.

H3: LOY mediates the effect of CRM on BUPER of steel manufacturers.

Research Conceptual Framework

From the review of concepts, theories and related research of many marketing academicians according to the above hypotheses, the researchers then wrote the research conceptual framework to search for the model of CRM and LOY that affect BUPER of steel manufacturers. The model, as shown in Figure 1, will show the casual variables, mediating variables and effect variables that affect each other as follows.

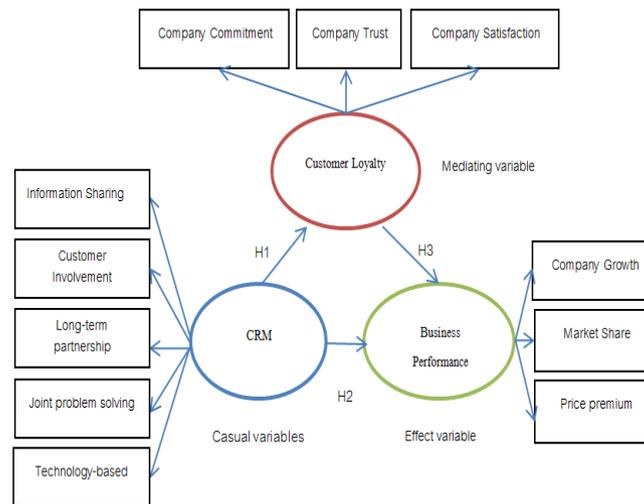


Fig. 2 Research Conceptual Framework

III. SCOPE OF THE STUDY AND RESEARCH METHODOLOGY

Scope of the study

For scope of the content, concepts, theories and related research on CRM, LOY, and BUPER of steel manufacturers in Thailand were studied. For scope of the area, the sample steel manufacturers were located in Bangkok Metropolitan Area. For scope of the population, the respondents were experienced staff working for steel manufacturing firms and

academicians, such as business owners, purchasing managers, marketing managers, production managers, or chief executives.

Research Methodology

1. Population and sample. The population was experienced chief executives working for 104 steel manufacturing firms that were a member of the Steel Industry Group, Federation of Thai Industries (Federation of Thai Industries, 2019). In the

qualitative study, the researchers chose 17 key informants using the purposive sampling to conduct in-depth interviews, as conceptualized by Macmillan (1971). In the quantitative study, stratified random sampling by area was conducted because the population had the same business characteristics (Kanlaya, 2010).

2. Data collection. The researchers collected data by dividing the information into two parts, comprising qualitative data from the interview and quantitative data from questionnaires, detailed as follows: 1) Data was collected from interviews with executives of steel manufacturing companies and executives of government agencies responsible for overseeing industrial entrepreneurs. After that, the data was compiled, integrated, and analyzed with content analysis technique, respectively. 2) Data was collected from questionnaires with 320 executives of steel manufacturing firms in Thailand in the areas of 4 provinces, including Bangkok, Samut Prakan, Samut Sakhon and Pathum Thani, in order to obtain the most normal distribution according to the principle of structural equation analysis and achieve the completion of research. The research objectives were informed before taking the questionnaires and then the questionnaires were checked for accuracy and numbers for further data analysis.

3. Data analysis. Details of the statistics used to analyze data from the questionnaires in this research were as follows: 1) Personal characteristics and levels of variables were analyzed using percentage, mean and standard deviation, including Skewness and Kurtosis to measure the distribution of data. 2) Confirmatory Factor Analysis (CFA), 2nd Order, was conducted to check the structural validity of the questionnaires. 3) Both direct and indirect effects between latent variables were analyzed to test the research hypotheses about the causal relationship. 4) The structural equation modeling was conducted to search for the model of CRM and LOY that affect BUPER of steel manufacturers in Thailand by analyzing all variables from 2nd Order CFA and causal relationship, simultaneously.

IV. RESULTS

Part 1: Preliminary information of the respondents

Data was collected from 320 executives in 140 steel manufacturing firms by using 5-rating-scale questionnaire. The survey results of the personal information characteristics of the steel manufacturing firms' executives showed that most of the samples were male aged between 41 - 50 years, graduated bachelor's degree. They had 7-to-9-year work experience and worked as a purchasing manager, with average monthly income of 30,001 - 40,000 baht, as shown in Table 1.

Table I
General Information of Respondents

General Information	No. (Persons)	Percentage	
1. Gender	Male	229	71.50
2. Age	41 – 50 years	78	24.50
3. Educational Background	Bachelor Degree	116	36.30
4. Job Position	Purchasing Manager	114	35.60
5. Work Experience	7 – 9 Years	67	21.00
6. Income/month	30,001 – 40,000 Baht	101	31.50

Test results of observed variables' statistical assumptions

Basic statistics used to study the distribution of 11 observed variables, measuring 3 latent variables, were mean, standard deviation (SD), maximum score (Max), minimum score (Min), Skewness and Kurtosis to check that how the

variables were different from the normal curve. The interpretation portrayed the mean from 4.51 to 5.00, representing a highest level, and the mean from 1.00 to 1.50, representing a lowest level, are shown in Table 2.

Table II
Basic Statistics of Observed Variables

ตัวแปร*	Min	Max	Mean	S.D.	Remark	C.V.	Skewness	Kurtosis	Sig.
CRM	Customer Relationship Management								
CRM_1	2.32	5.00	3.948	0.563	High	14.21	-.199	-.705	0.00
CRM_2	2.30	5.00	3.717	0.569	High	15.09	.142	-.736	0.00
CRM_3	2.19	5.00	3.790	0.568	High	14.78	.313	-.872	0.00
CRM_4	2.22	5.00	3.953	0.607	High	15.19	.125	1.703	0.00
CRM_5	2.25	5.00	3.844	0.573	High	14.84	.033	1.346	0.00
LOY	Customer Loyalty								
LOY_1	2.25	5.00	3.908	0.601	High	15.38	.317	1.685	0.00
LOY_2	2.33	5.00	3.891	0.561	High	14.40	.445	-.822	0.00
LOY_3	2.08	5.00	3.930	0.665	High	16.79	.621	1.814	0.00
BUPER	Business Performance								
BUPER_1	2.29	5.00	3.773	0.599	High	15.65	.163	-.435	0.00
BUPER_2	1.87	5.00	3.838	0.711	High	18.54	.742	1.272	0.00
BUPER_3	2.40	5.00	3.823	0.523	High	13.61	.269	-.581	0.00

Note: Customer Relationship Management (CRM), Customer Loyalty (LOY), Business Performance (BUPER), Information Sharing (CRM_1), Customer Involvement (CRM_2), Long-term Partnership (CRM_3), Joint Problem Solving (CRM_4), Technology Based (CRM_5), Company Commitment (LOY_1), Company Trust (LOY_2), Company Satisfaction (LOY_3), Company Growth

(BUPER_1), Market Share (BUPER_2), Price Premium (BUPER_3)

The results of the data analysis showed that the means of observed variables of (1) CRM were 3.717 - 3.953, (2) LOY were 3.891 - 3.930 and (3) BUPER were 3.773 - 3.838.

BUPER of Steel Manufacturers in Bangkok Metropolitan Area

Part 2 : Relationship Analysis Results of CRM, LOY, BUPER and Direct Effect of CRM on LOY and BUPER of the Steel Manufacturers in Thailand

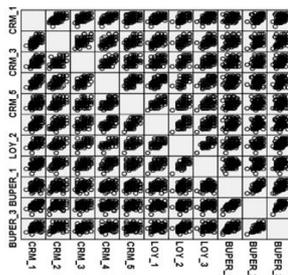
The relationship among observed variables was checked using examining the correlation between two variables by calculating Pearson's correlation coefficient. It was found that the highest relationship between the observed variables studied in the structural model was .705, which exposed no excessive relationship between pairs of variables, as suggested by Kline (2005). Therefore, there was no multicollinearity problem. Consequently, the data was appropriate to be used for analysis by the structural equation model technique (Hair, et al., 2006).

The linear relationship was checked by examining with the Scatter Plot Graph of observed variables studied in the structural equation model.

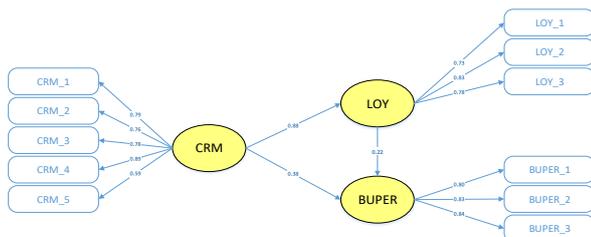
From Figure 2(a), it showed the relationship between observed variables studied in the structural equation model that all pairs were linearly related. It displayed that the observed variables were appropriate to be analyzed in the structural equation model without violating statistical assumptions of structural equation model analysis with LISREL program.

The quality of variables was checked in terms of structural validity using confirmatory factor analysis (CFA) technique by considering the standardized factor loadings. If the standardized factor loading is greater than .30, it means that the observed variable is a good factor of the latent variable. In addition, R^2 is examined to check the reliability of the observed variables and the quality of latent variables directly by calculating standardized factor loadings and the error variance (θ) of the observed variables which is an indicator of each latent variable in order to check the reliability of the latent variable directly by considering together with $\geq .60$ reliability of the latent variable (ρ_c) and $\geq .50$ variance (ρ_V), as suggested by Diamantopoulos and Siguaw (2000), including the $\leq .08$ RMSEA, as recommend by MacCallum et al. (1996).

To examine the structural validity of latent variables, the researchers chose to use all the factors of latent variables studied in structural equation model because each analysis of the factors studied in the model will cause the problem of Justification Model since some measurement models had fewer than 4 indicators, the researcher, therefore, decided to use such technique. The CFA results of observed variables were shown in Table 3.



(a)



(b)

Fig. 2 (a) Relationship among observed variables (b) the relationship model of CRM and LOY that affect

Table III
CFA results of the model on CRM and LOY Affecting BUPER of Steel Manufacturers in Bangkok Metropolitan

Factor Loadings			
Observe Variables	B_{sc}	S.E^{''}	t
CRM_1	0.79	0.03	16.43
CRM_2	0.76	0.03	15.64
CRM_3	0.78	0.03	16.26
CRM_4	0.89	0.03	19.78
CRM_5	0.59	0.03	11.25
LOY_1	0.73	0.03	14.39
LOY_2	0.83	0.03	17.20
LOY_3	0.78	0.03	15.68
BUPER_1	0.80	0.03	14.33
BUPER_2	0.83	0.04	15.83
BUPER_3	0.84	0.03	15.33

$\chi^2 = 51.98$, $df = 34$, $p = 0.02491$, $\chi^2/df = 1.5264$,
RMSEA = 0.041, RMR = 0.027,
GFI = 0.97, AGFI = 0.94

Note: **= $p < 0.01$, B_{sc} = standardized factor loadings

The results of CFA in Table 3 showed that the measurement models of CRM, LOY and BUPER of industrial business companies had positive values from .59 to .89, from .73 to .83, and from .80 to .84 factor loadings, respectively, which differed from zero at a statistically significant level of .05. When considering standardized factor loadings of CRM, LOY, and BUPER of industrial entrepreneurs, it found that jointly solving problems, company trust, and premium price had the most important loadings. When considering the construct validity test, the observed variables measured had greater-than-0.5 factor loadings. Therefore, the model of CRM and LOY affecting BUPER of the steel manufacturers in Bangkok Metropolitan Area had a good validity to use in data collection.

Part 3: Test Results of Model on CRM and LOY Affecting BUPER of Steel Manufacturers in Bangkok Metropolitan Area

Data was analyzed using structural equation modeling technique in order to meet the research

objectives 2 and 3. The researchers have examined the statistical assumptions and the data analysis results according to the research objectives were as follows: when checking the distribution of 11 observed variables studied in structural model using Chi-Square(χ^2), it found that all observed variables had no statistical significance ($p > .05$), which displayed that all observed variables in the model had a normal curve distribution. Consequently, all observed variables could be analyzed for structural model without violating the basic assumptions (Kelloway, 1998).

For the analysis of the model on CRM and LOY affecting BUPER of the steel manufacturers in Bangkok Metropolitan Area, the validity of the causal relationship model based on the hypotheses H1-H3 found that the Goodness of Fit Index (GFI) was .93, Adjusted Goodness of Fit Index (AGFI) was .94, and Root Mean Square Residual (RMR) was .027, which displayed that the causal relationships in the hypotheses H1-H3 was fit with the empirical data, as shown in Figure 1(b). When considering total effects, as shown in Table 6, the analysis results

depicted the direct effect of CRM on BUPER of industrial entrepreneurs, which concluded that CRM had a highest or 0.57 total effect size. When considering the direct effect of CRM on LOY, it found total effect size of 0.88. The overall effect sizes of each variable were high and affected BUPER of the industrial companies with the same direction, as shown in Table 4.

Table IV

Validity test results of the relationship model on CRM and LOY that affect BUPER of steel manufacturers in Bangkok Metropolitan Area

Variable	BUPER			CRM		
	T E	IE	D E	T E	IE	D E
LOY	0.22 (0.07) 7)	0.2 (0.07))	0.8 (0.06) 9)	0.8 (0.06) 9)		
	2.94	2.94	12.83	12.83		

Variable	BUPER			CRM		
	T E	IE	DE	TE	IE	DE
CRM	0.57 (0.07))	0.1 (0.07))	0.3 (0.15))			
	9.13	2.49	2.63			

Statistic: $\chi^2 = 51.98$ df = 34 P = .02491 GFI = .93 AGFI = .94 RMR = .027

Variables	C R M _1	CR M_ 2	CR M_ 3	CR M_ 4	CR M_ 5	LO Y_ 1
Validity	0.62	0.58	0.61	0.79	0.35	0.53
Variables	L O Y_ 3	LO Y_ 3	BU PE R_ 3	BU PE R_ 3	BU PE R_ 3	

	2		1	2	3	
Validity	0.69	0.60	0.64	0.69	0.70	
R ²	C R M 0.6 1	LO Y 0.7 8	BU PE R 0.3 3			

Note: TE = Total Effect, IE = Indirect Effect, DE = Direct Effect, No. in the bracket = Standard Error

The results of the study on indirect effect of CRM on BUPER of the steel manufacturers in Thailand found that CRM had an indirect effect size of .19 on BUPER of of the steel manufacturers in Thailand by the mediation effect of LOY. That is to say, if the manufacturers was successful, grew, and obtained increased market share, they must consisted of LOY which was caused by company commitment, company trust, and company satisfaction as they were the important variables for LOY.

Part 4: Guidelines on CRM for steel manufacturers in Thailand

The companies can set guidelines to meet the diverse needs of customers in each group to allow industrial business entrepreneurs to reach customers to develop the market or visit people related to the industry. The firms, moreover, can adopt various tools for marketing communications to customers in the era of Thailand industrial economy 4.0 by online social networks, websites, and email, which are considered as an important tool in listening to customers' comments and problems, resulting in immediate customer problem resolution

Aside from opening to existing customers' suggestions, the steel manufacturers must open to comments and recommendations from future customers of the company by grouping, prioritizing, and analyzing various related issues to lead to more comprehensive customer needs.

The main objective of building customer relationship is to increase the customer commitment to gain more market share by using customer survey to reflect the efficiency of industrial entrepreneurs. The firms, besides, should find ways to maintain long-term

relationship and create network in strengthening both entrepreneurs and their partners. This allows the manufacturers to maintain production flexibility and to respond the needs of different customers throughout the entire supply chain, including product development, raw material procurement, production, and marketing etc. The results of the hypothesis test can be summarized in Table 5.

Table V
Hypothesis test results

Hypotheses	Results
H1: CRM has a direct effect on LOY of steel manufacturers.	Accept
H2: CRM has a direct effect on BUPER of steel manufacturers.	Accept
H3: LOY mediates the effect of CRM on BUPER of steel manufacturers.	Accept

V. CONCLUSION

1. The results depicted the important factors as follows: (1) For CRM, the firms should give importance to solving problems together within the steel manufacturing industry Bangkok Metropolitan Area, as it is the highest priority of steel manufacturers, followed by long-term partnership by building relationships with customers in various dimensions such as sharing information by focusing on applying technology to CRM. The steel industry is an important basic industry in Thailand since it needs for a variety of ongoing business applications, such as construction, automotive, electronics, and packaging Industries. These are businesses that are essential to the economy, CRM is therefore very significant. Most of the steel manufacturers in Thailand are small and medium enterprises which tend to grow due to the large investment of the government, including infrastructure in the Eastern Economic Corridor and various electric train projects in Bangkok Metropolitan Area. Meanwhile, the related real estate and manufacturing industries tend to expand. 2) For LOY, The relationship between the entrepreneurs and their customers is shown in LOY by paying attention to the trustworthiness of suppliers at a highest level,

followed by the company satisfaction. However, although the overall demand for steel in the country is likely to be good, Thai steelmakers may not benefit because of the stable and fluctuating price trend. The strong competition has occurred after Chinese manufacturers have begun to set up steel factories in Thailand with cheaper machinery costs, which pressures entrepreneurs to face difficulties in business. Therefore, entrepreneurs should pay attention to the customer commitment, build trustworthiness, and satisfy customers in order to be a driving force for the business operation success. 3) For BUPER, the important factors include company growth, market share, and price premium.

2. CRM and LOY are the most related factors, followed by the relationship between CRM and BUPER of industrial business companies. From the relationship, it can be considered that the firms emphasize CRM based on long-term partnership, resulting in customers' commitment, satisfaction, and trustworthiness. LOY, therefore, has been created and then it affects BUPER of the steel manufacturers in Thailand.

3. From the significant findings, the model on CRM and LOY that affect BUPER of the steel manufacturers in Bangkok Metropolitan Area consists of 1) information sharing, 2) customer involvement, 3) long-term partnership, 4) joint problem solving, and 5) technology based CRM through LOY, comprising 1) company commitment, 2) company trustworthiness, and 3) company satisfaction.

VI. RECOMMENDATION

The study proposes the CRM guidelines for Thailand steel manufacturers that the firms should share information, create relationships with customers through various marketing activities, promote long-term alliances with industrial supply chain, solve problems mutually, adopt technology for CRM by considering online social networks and websites as an important tool in listening to customers, and communicate through email to collect comments and problems from customers, resulting in immediate customer problem resolution.

According to the direction of the National Economic and Social Development Plan and the Thai Industry 4.0 Development Plan for 20 years (2017 - 2036), as proposed by the Ministry of Industry, further studies on Thailand steel industry should focus in other variables, such as the risk management, labor management, environmental management, logistics and supply chain performance indicators. Future works should emphasize other industries, such as the food and agricultural industries, including the adjustments of sample and analysis of other variables that affect BUPER of industrial entrepreneurs.

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