

**How to Cite:**

Kortana, T., Suwandej, N., Wongjunya, N., & Kerdpitak, N. (2022). Effect of product and process innovation in interactive management control system on financial performance of SME in Thailand. *International Journal of Health Sciences*, 6(S4). <https://doi.org/10.53730/ijhs.v6nS4.5457>

## **Effect of Product and Process Innovation in Interactive Management Control System on Financial Performance of SME in Thailand**

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**Abstract**--Simons a framework of levers controls revealed that effective use and control of the management system (MCS) can significantly contribute to increased financial performance as well as operational performance. However, the main objective and aim of this research study are to evaluate the financial performance of SME firms in Thailand through the role of the effective use of management control systems. This research paper also examines the direct relationship between MCS and the financial performance of the sector. The research model of this study also investigates the mediating role of product and process innovation in improving the relationship between the financial performance of the sector and MCS. To find the impact of MCS on the firm performance this study collects most of the data from selected employees and managers of different SME firms of Thailand with the help of the survey questionnaire. The results that are calculated with the help of structural equation modeling indicate that MCS significantly influence the financial performance of the firm and also made a significant contribution in enhancing the operational performance of the sector. Furthermore, the findings of this study also demonstrate that product innovation improves the relationship between MCS and financial performance. Accepted hypotheses of this

research help many future analysts to understand the importance of MCS.

**Keywords**---Management control systems, product innovation, process innovation, financial performance.

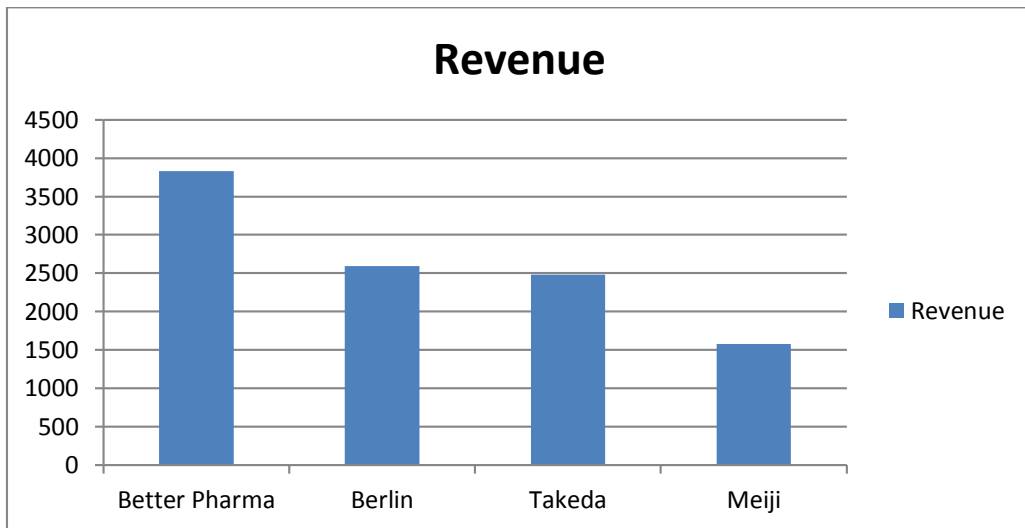
## Introduction

The challenges of current business market have made it compulsory for the firms to act more innovatively by addressing innovations in both their products and processes to be successful and lasting (Damanpour & Evan, 1984; Jansen, Van Den Bosch, & Volberda, 2006). Regarding this, MCS can reframe the innovation strategies so that a competitive advantage can be gained by the firms and they can increase their financial performance. MCS has wide uses in the decision making process of managers who can then plan, organize and monitor the activities of their firms to indulge in innovative activities (Chenhall, 2003; Lowe, 2019; Malmi & Brown, 2008; Kerdpitak, 2020). So, this study will use Simon's framework of MCS to see its effects for innovation and performance for the increasing SME firms in Thailand.

**Table 1. Thailand's Pharma sector (Thailand's FDA 2018)**

	<b>Figures</b>
<b>Market value</b>	177 billion Baht
<b>Ranking in ASEAN</b>	2 <sup>nd</sup>
<b>Growth rate (2020)</b>	5-6%
<b>Number of firms (2019)</b>	170

Thailand is Asia's medical hub and the Pharma industry of Thailand is the second largest in South Asia. The drug sector is projected to grow tremendously in the coming years owing to the skyrocketing demand of medicine since there has been a trend in increasing illness of the aging population in Thailand.



**Figure 1. Thai Pharma companies Revenue (Krungsri Research)**

Framework provided by (R. Simons, 1994) has highlighted the benefits of MCS for innovation, but it lacks to give a clear explanation of innovation from the perspective of product and process innovation separately as these are conceptually two different terms concepts. Moreover, study by (Alharbi, Jamil, Mahmood, & Shaharoun, 2019; Bin-Nashwan, Abdullah, & Obaid, 2017; Bisbe & Otley, 2004) has investigated product innovation only and has not addressed process innovation. Hence, discrepancy exists in the literature for this domain, which this study attempts to address. This paper addresses this discrepancy in the literature. The main objective for this study is to explore the implementation of Management control system as an interactive tool in the product and process innovation for achieving financial performance in the SMEfirms of Thailand. This study has other specific research objectives:

- To investigate how IMCS influences FP
- To investigate the mediating path of PI in the association of IMCS and FP
- To investigate the mediating path of PrI in the association of IMCS and FP

This study has contributed to the academic research by examining the interactive use of MCS to ensure product and process innovation as the potential path to increased financial performance. The findings of this study justify the use of MCS as an interactive tool for the managers of the firms who proactively want to increase their profits through inducing positive changes in their process and developing innovative products.

## **Literature Review**

### **Theoretical background**

The basis for this paper rests on “Simon’s taxonomy”, which proposes that interactive controls communicate the challenges and the awareness of these

challenges forces the organization to emphasize on innovation to cope with the needs and demands of business (R. Simons, 1990, 1991, 1994)

### **Impact of Interactive use of Management Control System (IMCS)**

MCS is the system of policies and procedures by the use of information for the conservation of organizational activities. It is the formal and systematic way to control activities for effective achievement of objectives. This system includes all the planning, reporting and monitoring of the processes to fulfill the goals of the firm (Akroyd & Maguire, 2011; Bisbe & Otley, 2004; Henri, 2006). According to (R. Simons et al., 2000; R. L. Simons, 1992). Financial performance is the outcome of the organizational activities, which can be calculated with measures like profit, ROI, market share etc (Kostopoulos, Papalexandris, Papachroni, & Ioannou, 2011; McWilliams & Siegel, 2000; Murray, Kotabe, & Wildt, 1995). Studies by have proved that the interactive use of MCS has the potential to yield increase in profits (Bin-Nashwan et al., 2017). This shows that IMCS can positively influence the FP. Hence the hypothesis:

***H1: IMCS has significant association with FP***

### **Mediation of Product Innovation (PI)**

There are several ways in which PI can be promoted by interactive use of MCS. Since MCS is characterized with communication and knowledge transfer, new and innovative strategies can be triggered by workers in the new product making process (Akroyd & Maguire, 2011; Alharbi et al., 2019; Bigliardi, 2013). Also, IMCS takes the product innovation away from the traditional ways to novel and meaningful intuitions (Dougherty & Hardy, 1996; Lopez-Valeiras, Gonzalez-Sanchez, & Gomez-Conde, 2016; Van de Ven, 1986). This is a clear indication that by implementing IMCS, Product Innovation can be stimulated and redesigned in any firm. Studies conducted by (Aguilera-Caracuel & Ortiz-de-Mandojana, 2013; Akgün, Keskin, & Byrne, 2009; Przychodzen & Przychodzen, 2015; Kerdpitak, 2021) have proposed that inducing innovation in product development in any firm can contribute to its FP. So, the study can examine the mediating role of PI on the positive linkage of IMCS and FP. Hence, the hypothesis:

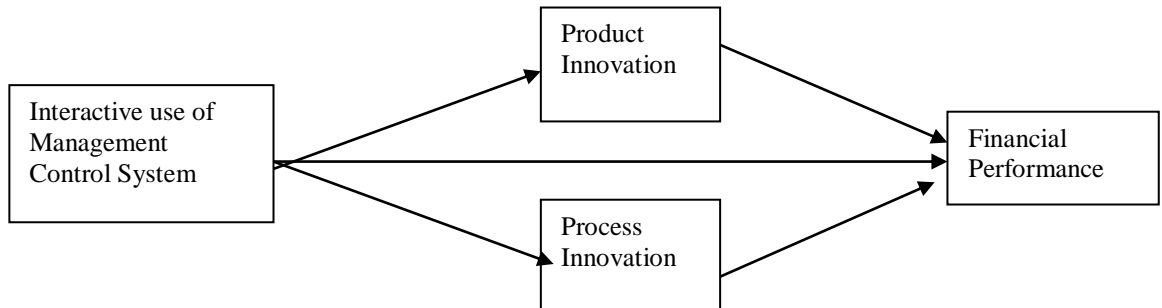
***H2: PI significantly mediates the association between IMCS and FP***

### **Mediation of Process Innovation (PrI)**

The interactive use of MCS is recognized as contributing to the success of process and overall organizational innovation as the knowledge shared and transferred within the organization can break the ceiling and forge the workers to think 'out-of-the-box' to produce innovation process ideas (Alharbi et al., 2019; Li, Yang, Duan, & Wei, 2019; Lopez-Valeiras et al., 2016; Kerdpitak, 2022). Further, the process innovative reforms can greatly lead to improved manufacturing and service processes (López-Nicolás & Meroño-Cerdán, 2011; Rosenbusch, Brinckmann, & Bausch, 2011), thus reducing the costs and increasing profits, leading to higher level of FP (Ullman, 2019; Xie, Huo, Qi, & Zhu, 2015). Hence, the mediating role of PrI can be tested in this relationship as a positive

association can be seen among IMCS and FP of firm. So, the study has given the following hypothesis for this:

**H3: *PI significantly mediates the association between IMCS and FP***



**Figure 2. Research Framework**

## Methodology

### Sample and Data

The current study is conducted to discover the impact of purposed variables on financial, in Thailand's SME sector that is largest market of Thailand and 2<sup>nd</sup> largest Asian industry. Despite of growing market many firm are facing financial problems. So to view how these firms can improve financial performance a purposive sample of 370 workers from pharmacies working in Thailand were recruited in survey. Research method was online survey and data collection tool was self-administrative questionnaire. Questionnaire was distributed through google forms to get more information in minimum time. Questionnaire was developed after interviewing financial managers of 10 firms in order to understand basic issues firms have. Five hundred questionnaires were filled online by pharmacies workers. 50 questionnaires were automatically rejected because they were filled within 60 seconds, and 55 questionnaires have insufficient data, 370 questionnaires were valid and usable for further analysis. The details such as email addresses and contact information was obtained from SME association of Thailand.

### Measurements

Variables of purposed model for this research are measured by altered scales adopted from previous literature. All variables were quantified in 5 Point-scale ranging from 1= strongly disagree to 5= strongly agree.

Interactive use of management control system has three dimensions including Interactive use of budgets, Interactive use of balanced scorecards and Interactive use of project system that are measured by six items adapted from a scale developed and confirmed by Bisbe and Otley (2004). One of the question is "Permanent personal attention by the CEO" which indicated on 5 Point-Likert scale by respondents, a value  $\alpha = 0.926$  for reliability was found designates high composite reliability.

Scales for product innovation were adopted from Eurostat (1997) framework, 7 items evaluated the product innovation of firm “ Extension of product range within main product field through technologically improved products” Responses were recorded on 5 Point- Likert scale yielding  $\alpha = 0.829$ . To confirm Process innovation of the firm 4 items were used that were altered, source of these items was Van Beveren and Vandebussche (2010), these items evaluates firms process are innovative one sample item is “ Number of implemented innovations in the manufacturing process referring to the product line”. Respondents valued process innovation on 5 Likert- point scale ranging from 1= strongly disagree, 2= disagree, 3=neutral, 4=agree, 5=strongly agree. The composite reliability for this construct was 0.85 which means good reliability. The dependent variable financial performance integrates FINAN scale projected by Ruf and Muralidhar (2001) to estimate the financial situation of firms. For this purpose, four items were picked, one of the sample item is “This company is high performing company and deliver high financial results” it was indicated on 5-degree scale with indication 1=very week and 5= very strong it was validated by Cronbach Alpha 0.75.

## Results Interpretation Demographics

In this research, a sample of total of 411 respondents was constructed, out of which 56.4% were male and 43.6% were found as females. The main aim of this section is to provide particular properties of a selected population and this section also provides significant data regarding study respondents that play a part in further findings. The age of 29.9% of the participants was up to 26 and the main aim for the elevation observed in age is the level of participants considered. This section provides help in further decisions and results of the study.

## Descriptive statistics

All the minimum and maximum values are presented in table 1 and this table also contains all the descriptive statistics of data. In this section coefficients of skewness and mean were also identified and analyzed to check the gathered data for the presence of outliers. Inclination f responses and the normality of information and data were also been identified in this section. By table 1 it can be seen that all the mean values are nearer to 4 which mainly shows the agreement of participants with statements. The values of skewness are also included in the category of +1 and -1, which indicate the normality of data.

**Table 2: Descriptive Statistics**

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness	Std. Error
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic
IntMCS	411	1.00	5.00	3.4265	1.21931	-.689	.120
ProInn	411	1.00	5.00	3.4433	1.15397	-.856	.120
ProcInn	411	1.00	5.00	3.5872	1.21717	-.673	.120
FinPerf	411	1.00	5.00	3.6614	1.14358	-.840	.120

Valid N 411  
(listwise)

### Factor loading and convergent/divergent validity

The level of composite validity and reliability is greater than 0.7 and CR and AVE are also more than 0.7 (Hassan, Hameed, Basheer, & Ali, 2020; Iqbal & Hameed, 2020). The CE and MCS values are also greater than 0.4. Thus, discriminant and convergent validity are present in table 3.

**Table 3: Factor Loading and Convergent Validity**

	1	2	3	4	CR	AVE
MCS1		.768			0.951	0.772
MCS2		.827				
MCS3		.906				
MCS4		.824				
MCS5		.904				
MCS6		.917				
PrI1	.701				0.948	0.727
PrI2	.783					
PrI3	.819					
PrI4	.832					
PrI5	.829					
PrI6	.827					
PrI7	.808					
PI1			.765		0.932	0.761
PI2			.801			
PI3			.796			
PI4			.799			
FP1				.792	0.918	0.749
FP2				.835		
FP3				.809		
FP4				.812		

**Table 4: Discriminant Validity**

	CE	MCS	PrI	FP
<b>PI</b>	<b>0.879</b>			
<b>MCS</b>	0.529	<b>0.878</b>		
<b>PrI</b>	0.654	0.482	<b>0.851</b>	
<b>FP</b>	0.639	0.431	0.612	<b>0.861</b>

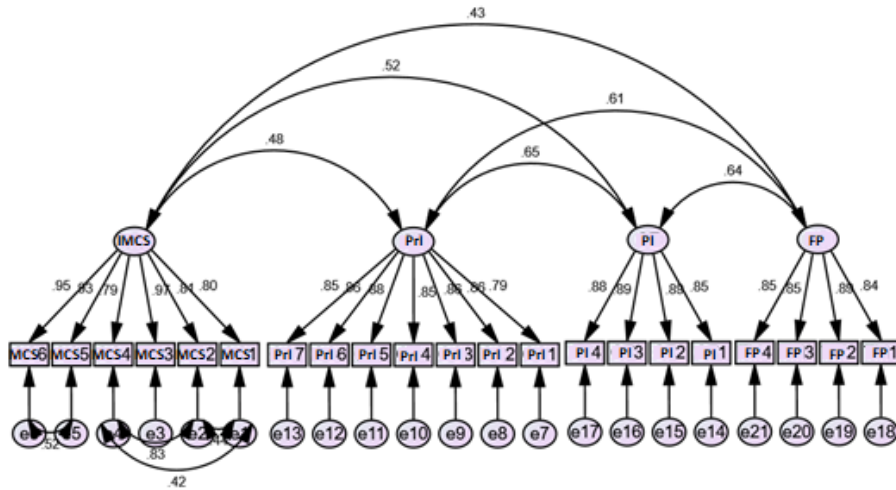
### Confirmatory factor analysis and KMO

Table 4 is the representation of results and outcomes that are mainly constructed from the confirmatory analysis. The CMIN value is 2.816, less than 3, GFI is higher than 0.8(0.89). On the other hand, IFI and PII are higher than 0.9(0.967) and the value of RMSEA is less than 0.8(0.065). KMO is the most positive type of

test that mainly used in almost every type of research because this type of test gives huge benefits to analysts and provides significant results.

**Table 5: Confirmatory Factors Analysis and KMO**

PIA Indicators	CMIN/DF	GFI	IFI	PII	RMSEA	KMO
Threshold Value	≤ 3	≥ 0.80	≥ 0.90	≥ 0.90	≤ 0.08	0.6 – 1.0
Observed Value	2.816	0.898	0.967	0.968	0.065	0.936



**Figure 3. CFA**

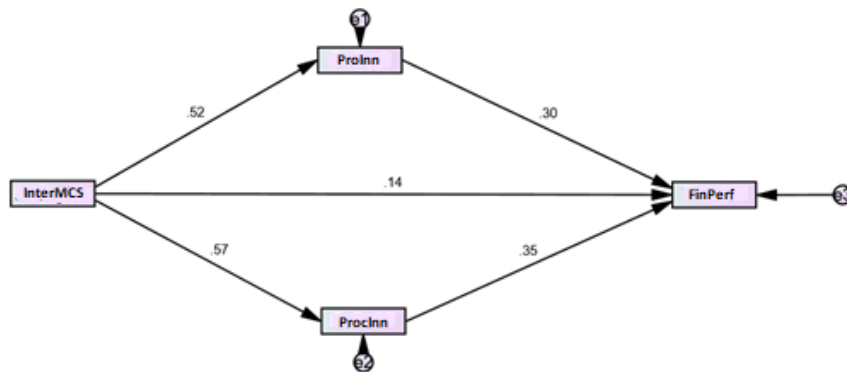
**SEM**

A point change in MCS constructs a positive effect of 0.14 in FP which makes the relationship positive and significant, and hence the hypotheses are supported and accepted. A significant increase in MCS and PrI constructs significant variations of 0.52% and 0.30% in FP, this generates positive relationships and finally, the hypotheses are accepted and supported to the results of the study. The SEM results and findings revealed that all the mediated variables show positive impacts and so the hypothesis is accepted.

**Table 6: Structural Equation Modeling**

Hypothesis	B-Value	SE	P-Value	Decision
MCS→FP	.138	.046	.007	Accepted
MCS→PrI→FP	.152	.035	.000	Accepted
MCS→PI→FP	.194	.028	.000	Accepted





**Figure 4: SEM**

## Discussion and Conclusion

### Discussion

In the past few decades, there has been increased interest in evaluating the important relationships between financial performance and the use of management control systems (MCS) that brings significant changes in the operational environment of the sector. Research by Wijethilake, Munir, and Appuhami (2018) explained that management control systems are an important asset of any organization because these systems play a significant part in evaluating the overall performance of the sector. According to the initial findings of the study, it is revealed that the impact of MCS on the financial performance of SME firms in Thailand has been significant and favorable; therefore the hypotheses have been accepted. A management control system or mechanism is an important technical system of an organization that enables the firm to collect data and then use this data to examine the performance of the company (Pešalj, Pavlov, & Micheli, 2018). The impact of MCS is so significant in the financial performance of the firm because MCS effectively controls all the aspects of the firm that generate huge benefits for the company.

The results and findings of this research study also suggest that the mediating impact of product innovation also improves the financial performance of the firm. Product innovation can be enhanced the productivity of firm operations with reduced costs, with this advantage the financial performance of the firm automatically increased.

### Conclusion

The given study shows that an interactive system at the management level in the industry opens the door of success for the firms and the industries. When the management system influences the system positively, it affects at all the levels of the firm and the proper implementation of the interactive management control system creates harmony, peace, devotion and a positive atmosphere is build up to

work within the firm. This has a positive effect on product innovation and the process of innovation. This collectively impacts a positive influence in all sectors.

### **Implications and Limitations**

This theory is very positive and easy to adopt in achieving a harmonious and peaceful atmosphere for production by adopting the means of innovations. This research also expresses that good management control can lead the industry to win a distinguished place and the use of innovation in the industry appreciated by the management leads the industry to progress and leading ahead in the competition age.

Despite its applications, this research study has some limitations that generate opportunities for future analysts. First, the cross-sectional survey-based design of this research does not allow the analyst to assist casual relationships between different variables, thus, due to this limitation, it is proposed to future studies that they should conduct a study with a longitudinal design for accurate results and suggestions. Another limitation is that this study only focused on the arena of MCS in the Thailand SME sector. So, future studies should focus on other variables to evaluate the financial performance of the firm.

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