



# Thai gem and jewellery industry business performance: Is continued growth dependent on Tourism?

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## Abstract

Thailand's gem and jewellery industry is world famous to both the vast assortment of international traders and the 40 million tourists which visit the Kingdom annually. Presently, the sector is third in export value, which in 2018 (including gold) reached nearly \$12 billion and employed an estimated 800,000 artisans and craftsmen. Therefore, research was undertaken to determine which variables influenced a Thai gem and jewellery enterprise's business performance (BP). From the five-level questionnaire collected from a sample of 372 entrepreneurs and managers, an initial confirmatory factor analysis (CFA) was conducted on the study's four additional latent variables of firm strategy (FS), product innovation (PI), service innovation (SI), and competitive advantage (CA). LISREL 9.1 was then used to develop a structural equation model (SEM) path analysis. Results revealed that all the causal variables positively influenced BP as the combined variance of influence was 77% ( $R^2$ ). Further results showed that the variables having the greatest influence on BP were FS, PI, CA and SI, with total effect values of 0.88, 0.60, 0.16 and 0.02, respectively. There was also an extremely strong interrelationship between FS and PI as  $r = 1.00$ , the t-test value = 14.72, and  $p \leq 0.01$ . Personal interviews with industry leaders also noted the importance of the necessity for free-trade agreements, the need for a new generation of trained craftsmen, and the need for continuing Thai government support. Finally, both domestic consumers and foreign tourists are seen as an essential market for future growth.

**Keywords:** Competitive advantage, firm strategy, process innovation, service innovation, tourism.

## Introduction

A McKinsey study has reported that by 2020 the global jewellery industry is expected to total €250 billion (Dauriz et al., 2013). In Thailand, overall gem and jewellery shipments in 2018 (including gold) reached nearly \$12 billion (Workman, 2019), making this 800,000 worker sector Thailand's third in export value (Arunmas, 2019). Presently in Thailand, from January to July

2019, the export value of gems and jewellery grew by 29.3% whose export value was estimated at US\$9 billion, with the three largest export markets being Switzerland (56%), Singapore and Cambodia (TheThaiger, 2019). This compares to 2017, when the three largest were Switzerland (27.44), Hong Kong (19.16%), and the US (9.15%) (GIT, 2018). Markets shift quickly and flexibility is required as the present trade war between the US and China has been stated to positively affect Thailand’s gem and jewellery sector as the US has increased tariffs on these Chinese produced items.

Figure 1 also shows the Thai sector’s cyclic nature which is tied to other factors such as global recessions.

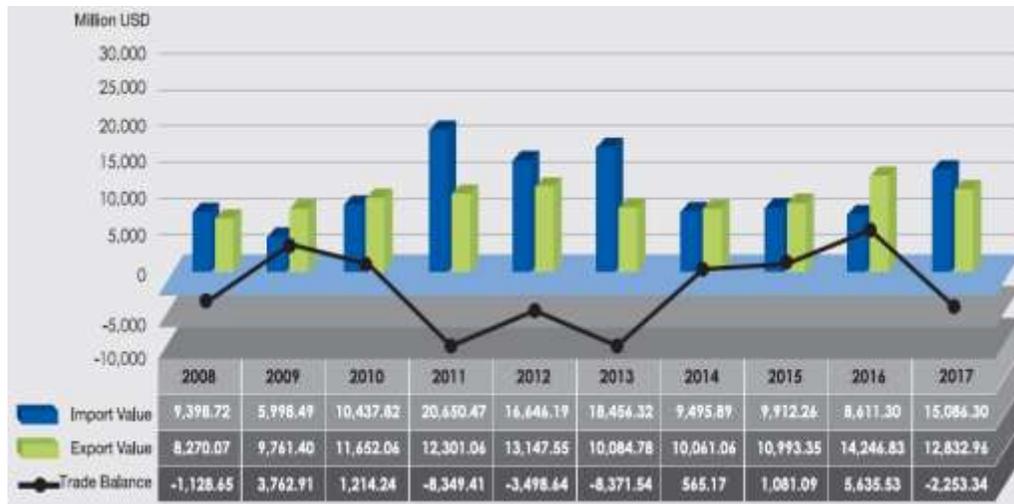


Figure 1: Thailand’s yearly gem and jewellery sector value from 2008 to 2017  
 Source: Gem and Jewelry Institute of Thailand (GIT)

Today, the global precious gems and jewellery industry is still primarily local, with the top ten groups representing only 12% of the worldwide market, with the market’s vast majority consisting of strong national retail brands, such as China’s Chow Tai Fook or Germany’s Christ, with most SMEs (small-medium enterprises) operating as single-branch outlets. This is consistent with Euromonitor (2019) research in which it was stated that Thailand’s jewellery market is also fragmented with many international and local brands, comprising mostly local and family-owned business such as Jubilee, which has opened 125 branches across Thailand. In costume jewellery, Swarovski Thailand also reported double-digit value growth in 2018 for the third consecutive, thanks to aggressive marketing strategies at targeting both Thai consumers and Thailand’s 40 million foreign tourists.

Thai language news also shouts headlines about foreigners and tourists flocking to buy Thai seller gemstones (Prachachat, 2018), with the Thai government reducing import barriers of raw materials from other countries helping to increase demand. This is part of a policy to make Thailand a ‘jewellery hub’, with many of 2018’s 10.5 Chinese visitors to Thailand being buyers of gemstones such as rubies and sapphires (Prachachat, 2018).

Furthermore, world renowned Chanthaburi Province has a long history of being a leading area for the gem trade but today more than 80% of the gemstones are imported from Africa or other places such as Brazil, Myanmar, Mozambique, Cambodia, and Vietnam. Once famous for Siam rubies, today tourists and traders search the weekend stalls for sapphires, topaz, and amethyst, with topaz and sapphires still being mined in Chanthaburi Province.

As raw materials have diminished domestically, Thailand is turning to its hundreds of years of experience in gem and jewellery intricate craftsmanship expertise to promote Thailand as a



'jewellery hub' with multiple innovative programs and processes (Oxford Business Group, 2019). As the domestic supply of unfinished gems is now insufficient for commercial-scale operations, the import from countries has increased rapidly. However, as locals have stated their expertise and experience is second to none when it comes to creating value-added products, such as coloured gemstones from heat treatment (Pisutha-Arnond, 2017), Thailand's gem and jewellery entrepreneurs are seeking out new markets and methods to sustain their business performance.

As early as 1995, Thailand's Chulalongkorn University started the development of a gemstone testing laboratory which issued certifications of quality which at the time the gem and jewellery export industry was valued at 200 billion baht (Siripant, 2019). From these humble beginnings, the industry has grown to today's estimated 800,000 jobs from mining, cutting, polishing, jewellery design and manufacturing. This was the starting point for today's Gem and Jewelry Institute of Thailand (GIT) being officially established on October 1, 1999. Subsequently, GIT's Precious Metal Assay Laboratory was established in 2003. Later Thailand's gems and jewellery 'Gemopolis' was upgraded to an industrial free zone. It is here where the concept of 'clustering' was employed to centralise gem and jewellery manufacturing, trading, and the creation of service innovation (Albaladejo, 2002). Additionally, Gemopolis reported 200 tenants (Temphairojana, 2016) have benefits including income tax exemption corporations, exemption of import duty and value-added tax for numerous capital expenditures and finished products, and 100% foreign ownership of companies and property.

Today, however, with the rapid depletion of domestic raw materials, which has necessitated the import from around world of artisan materials to add value to, industry leaders are calling for new ways to increase their business performance. One suggestion is to find ways to increase sales within the Thai domestic market to both the 70 million Thai consumers and the 40 million foreign tourists (Potjanasuntorn, 2019). It was stated by GIT's Chairman of the Board of Executive Directors that Thailand needs to inspire these travellers and consumers to purchase gems and jewellery as souvenirs as reminders of their visits to Thai attractions and sites.

As we can see, the Thai gem and jewellery sector is a vibrant, world-renowned economic sector made of a highly culturally diverse group of entrepreneurs, traders, artisans, and craftsmen. Added to the mix, are the retail buyers, both Thai and foreign tourists, who seek out items as investments, souvenirs, or personal pleasure. As such, the researchers set out to investigate the highly dynamic business performance of these entrepreneurial SME owners. After an analysis of the literature, the authors identified four additional factors to add to the study. Therefore, after the paper's introduction, the reader will find the literature review, followed by a materials and methods section, the results, the discussion, and the conclusion and implications.

## **Objectives**

1. To investigate the interrelationships of the factors influencing the business performance of Thai entrepreneurial gem and jewellery SME enterprises.
2. To use a CFA to make a determination if the data fits the model.
3. To use an SEM of the factors influencing Thai gem and jewellery business performance.

## **Literature Review**

### **Firm Strategy (FS)**

Kaplan and Norton (1996) link corporate strategy to the use of their balanced scorecard (BSC) measurement framework, with Silk (1998) reporting 60% of the *Fortune 1000* companies have



made efforts to use the balanced scorecard. However, Thai gem and jewellery enterprises are more comfortable as being classified as SMEs, with most BSC empirical research conducted in large firms (Malagueño et al., 2018). Therefore, other means to analyse a Thai gem and jewellery enterprise strategy is probably best.

'Strategy' as used by Thai gem and jewellery entrepreneurs is probably interpreted as how to achieve product sustainability as domestic resources are quickly diminishing (Trirotanan, 2019). It probably also entails where to replenish their aging and highly skilled artisans with a younger generation of workers. Zheng et al. (2010) has also stated that innovation and organisational effectiveness is affected by knowledge management when it is used together with organisational culture, structure and a firm's strategy. It must also include being aware of ever-changing consumer demand to stay competitive in the markets (Sriorathaikul, 2019). Furthermore, quality control and the certification of quality has also become critical to Chinese buyers of Thai gemstones, thus the strategic importance to the industry of institutions such as GIT.

Also, based on numerous published interviews with industry leaders, there seems to be a common theme concerning the freer movement of materials or 'free-trade deals' in and out of Thailand (Trirotanan, 2019), such as in the case of Hong Kong. There is also a need for continuous and on-going government support as part of the industry's strategy (Sriorathaikul, 2019).

Therefore, from the authors' understanding of Thai gem and jewellery entrepreneur strategy (FS), they *marketing communication* (x1), *quality control* (x2), and *sales strategy and budgeting* (x3) as manifest variables to the study. Additionally, three hypotheses were conceptualized for the analysis which included:

*H1: FS directly influences BP.*

*H2: FS directly influences PI.*

*H3: FS directly influences SI.*

## **Product Innovation (PI)**

Innovation has been defined in many ways by numerous scholars over the past decades. As early as 1949, Schumpeter discussed innovation in terms of how a firm uses their existing resources to develop new products or new methods. Drucker (1994) wrote that innovation is a tool of entrepreneurs, which creates competitive potential and wealth. Freeman and Soete (1997) reported that innovation can occur when a product or process is enhanced and becomes commercially viable.

Furthermore, PI has been stated to occur when a firm produces products or has a service that is difficult if not impossible to replicate (Aziz & Samad, 2016). Distanont and Khongmalai (2018) also have written innovation helps firms create long-term competitiveness by knowledge, the use of technology skills, obtaining creativity and development experience and introducing new ideas in the form of products, processes, or business models. Also, PI allows firms to stay ahead of their competitors by being the first to market with new products, this increasing their market share. Furthermore, for better or worse, an organisation's culture can affect the staff's knowledge sharing attitudes and behaviours (Molose & Ezeuduji, 2015). Support for this comes from early research by Damanpour (2013), in which it was reported that a new innovation's success within an organization comes from how well the staff accepts the innovation.

Therefore, from the authors' literature review related to *product Innovation* (PI), the following two manifest variables were determined. These included *new product innovation* (y3) and *known*



*new product* (y4). Additionally, two additional hypotheses were conceptualized for the analysis which included:

*H4: PI directly affects BP.*

*H5: PI directly affects CA.*

### **Service Innovation (SI)**

Vargo and Lusch (2008) have reported that SI in the hospitality hotel industry is essential for firm profitability, the foundation for customer satisfaction and retention, and a hotel's reputation both domestically and internationally.

Therefore, from the authors' literature review related to *service Innovation* (SI), the following three manifest variables were determined. These included *new service channels* (y5), *service platform* (y6), and *service channel consistency* (y7). Finally, one additional hypothesis was conceptualized for the analysis which included:

*H6: SI directly influences CA.*

### **Competitive Advantage (CA)**

Having a CA is what an enterprise's merchandise or services better to that of the competition to the consumer, and just because you are the leader today does not mean you will the leader tomorrow (Porter, 1985). Furthermore, Porter (1988) suggested that firms need to articulate clear objectives, strategies, and operations to build a sustainable CA. The organization's' culture and employee values must also align with these objectives. Porter specifically stated that corporate CA involved cost leadership, differentiation, and focus. Later, Porter (1988) stated firm CA can come from exceptional merchandise or services at lower cost. Furthermore, CA is garnished from production efficiency, superior goods, and items with high customer satisfaction values.

Therefore, from the authors' literature review related to *competitive advantage* (CA), the following two manifest variables were determined. These included *competitor understanding* (y8) and *competitor analysis* (y9). Finally, one additional hypothesis was conceptualized for the analysis which included:

*H7: CA directly influences BP*

### **Business Performance (BP)**

Wheelen and Hunger (2015) have suggested that tangible and intangible resources are used for a firm to obtain their goals and achieve superior BP. In the past, performance was defined as a measurement of profit, costs, and market share (Obeidat, 2016), but today, organizational managers are shifting their emphasis to less traditional definitions. Unlike financial performance measures, non-financial performance measure (NPFMs) is more useful for planning purposes and provide enterprises with future-oriented, feed-forward information (Guilding, 2014). In addition, NPFMs provide a closer connection to long-term organisational strategies (Mjongwana & Kamala, 2018).

In Thailand, NPFMs entail a multitude of factors that affect a Thai gem and jewellery enterprise BP. To start with, there are extreme weather events such as floods that can curtail mining and logistics operations for extended periods of time (Pathak & Ahmad, 2016). Furthermore, on a normal day, transportation and logistics processes have also been discussed as problematic and

costly, with expensive infrastructure programs currently underway to achieve more efficient processes. Additionally, other papers and articles have detailed the shortcomings of the Thai education system, lack of worker critical and creative thinking skills, and the need for more foreign language and cultural skills.

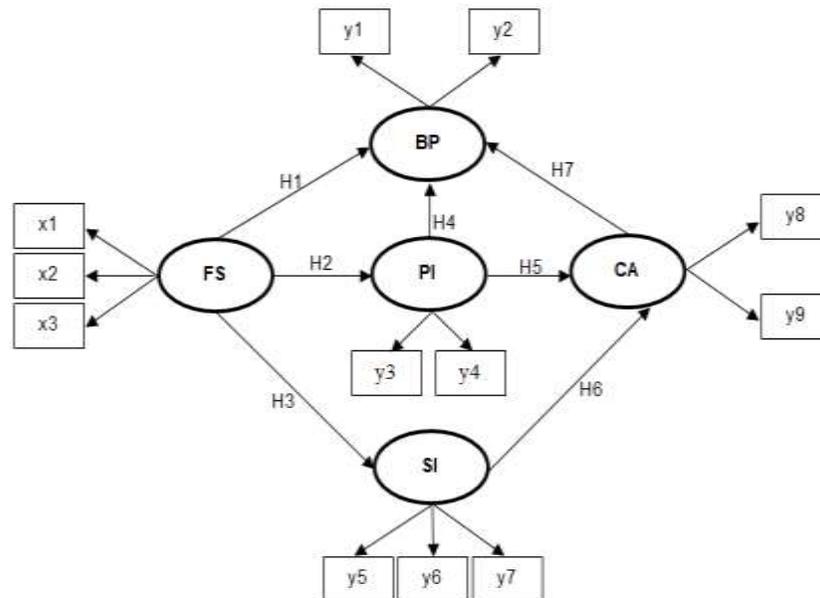
Furthermore, SMEs have been stated to lack managerial and knowledge skills (Chumkate, 2015), entrepreneurial and marketing skills (Pholphirul & Bhatiasevi, 2012), lack of access to financial resources (Thampradi & Fongsuwan, 2014), and lack of production or manufacturing technological knowhow (Rojsurakitti, 2015). Thai government programs have been implemented to address many of these concerns, but their level of success is open for discussion.

Tourism has also been touted as a saviour when other industries are in a downturn (automotive parts, consumer electronics, agriculture, rubber, etc.), but tourism can also be very sensitive to external and internal events such as trade wars, accidents, and competition for tourism from regional neighbours.

Therefore, from the authors' literature review related to a *business performance* (BP), the following two manifest variables were added to the study. These included *financial performance* (y1) and *nonfinancial performance* (y2).

### Conceptual Model

The authors have an extensive literature review conceptualized the following seven hypotheses and framework (Figure 2):



**Figure 2.** Conceptualized Model  
 (Source: Authors' research from theory and literature)

### Materials and Methods

An initial CFA was used to determine the data fit to the model and a subsequent SEM to analyse and test the seven hypotheses. The study's population was obtained from the 1,375 gem and jewellery entrepreneurs contained in GIT directory. The initial sample of 600 was selected via simple random sampling from the firms located throughout Thailand listed in the GIT directory.



## The Sample

The number of surveys targeted for collection and SEM analysis was based on statistical sample size theory. However, a well-established rule of thumb for CFA and SEM sample sizes is a minimum number of measurement variables (questionnaire item statements) \* 20 (Schumacker and Lomax, 2010). As the questionnaire contained 12 main items, a theoretical target of 360 was discussed, but was expanded to 600 to allow for non-response errors (Dillman et al., 2013). Therefore, starting in January 2016 working through February 2017, the researchers used online mailing, follow-up phone calls, and personal visits to obtain a completed and audited sample size of 372 questionnaires, representing 62% of the targeted sample.

## The Research Instrument

The questionnaire consisted of six parts, in which part 1 contained seven items about the owner/manager's personal information including their gender, age, education level, position, years in business, and number of employees. Parts 2 - 6 used a five-level scale to inquire as to the entrepreneur's opinions concerning each survey item. The number '5' was used to 'most agreement', '3' indicated 'moderate agreement' and '1' indicated 'least agreement.'

## Questionnaire Validation

Questionnaire reliability testing was accomplished by use Cronbach's  $\alpha$  on the study's five expert responses from the initial questionnaire development focus group. Then, the reliability was tested by use of a 30 member pilot test with a group not used as participants in the subsequent analysis which had an average value of .80 (Table 3 and Table 4), which was ranked as acceptable (Cho and Kim, 2015). This included part 2's *firm strategy* (FS) with 3 items ( $\alpha = 0.79$ ), Part 3's *business performance* (BP) with 2 items ( $\alpha = 0.96$ ), part 4's *product innovation* (PI) with 2 items ( $\alpha = 0.77$ ), part 5's *service innovation* (SI) with 2 items ( $\alpha = 0.70$ ), and part 6's competitive advantage (CA) with 3 items ( $\alpha = 0.80$ ).

## The CFA Analysis

LISREL 9.10 was used to conduct an initial CFA on the variables conceptualized to be influencing BF. Interpretation of the accuracy of the SEM made use of goodness-of-fit [GoF] criteria detailed in Table 3. If the calculated statistics passed the established GoF criteria, it supported the model's accuracy being consistent with the data.

## Results

### Gem and Jewellery Entrepreneurs and Managers Characteristics

Table 1 details the results from part 1 of the gem and jewellery owner/manager's questionnaire, with 87.63% of the respondents indicating they were the owners, with 44.62% reporting their firm had been operating ten years or more. We also see that women were in the majority with 59.95%, with 31.99% being from 31-40 years of age. Furthermore, 78.76% had obtained at least a BA or BS degree. Finally, 35.48% stated they had 21-40 employees.



**Table 2.** Thai gem and jewellery entrepreneur characteristics (*n* = 372)

Questionnaire Item	Frequency	%
<b>Gender</b>		
Men	149	40.05
Women	223	59.95
<b>Total</b>	<b>372</b>	<b>100</b>
<b>Age</b>		
30 or under.	55	14.78
31-40	119	31.99
41-50	112	30.11
51-60	64	17.20
60 or over	22	5.91
<b>Total</b>	<b>372</b>	<b>100</b>
<b>Level of Education</b>		
High School or Vocational Certificate	22	5.91
BA or BS degree	293	78.76
Graduate studies or graduate degree	48	12.90
Other	9	2.42
<b>Total</b>	<b>372</b>	<b>100</b>
<b>Position</b>		
Owner	326	87.63
Manager/executive	46	12.37
<b>Total</b>	<b>372</b>	<b>100</b>
<b>Business longevity</b>		
Less than 1 year.	22	5.91
1-5 years.	85	22.85
6-10 years.	99	26.61
Over 10 years.	166	44.62
<b>Total</b>	<b>372</b>	<b>100</b>
<b>Number of Staff</b>		
Up to 20	115	30.91
21-40	132	35.48
41-60	105	28.23
61-80	18	4.84
Over 80	2	.54
<b>Total</b>	<b>372</b>	<b>100</b>

Source: Authors' research questionnaire

### The GoF Analysis

From the CFA analysis, a GoF assessment was made to determine if the data fits the model. From that analysis, all indices were either validated or found to be acceptable (Table 2).



**Table 2.** GoF criteria and results.

Indices	Criteria	Values	Results	Supporting theory
Chi-square: $\chi^2$	$p \geq 0.05$	0.98	validated	Rasch (1980)
Relative Chi-square: $\chi^2/df$	$\leq 2.00$	0.45	validated	Byrne et al. (1989)
RMSEA - root mean square error of approximation	$\leq 0.05$	0.00	validated	Hu and Bentler (1999)
GFI - goodness of fit index	$\geq 0.90$	0.99	validated	Jöreskog et al. (2016)
AGFI - adjusted goodness of fit index	$\geq 0.90$	0.98	validated	Hooper et al. (2008)
RMR - root mean square residual	$\leq 0.05$	0.01	validated	Hu and Bentler (1999)
SRMR - standardized root mean square residual	$\leq 0.05$	0.01	validated	Hu and Bentler (1999)
NFI - normed fit index	$\geq 0.90$	0.99	validated	Schumacker and Lomax (2010)
CFI - confirmatory fit index	$\geq 0.90$	1.00	validated	Schumacker and Lomax (2010)
Cronbach's $\alpha$	$\geq 0.70$	0.80 (average)	acceptable	Tavakol and Dennick (2011)

Source: Authors' CFA analysis using LISREL 9.1

### CFA Results

Table 3 shows the CFA results for external latent variable FS, while Table 4 shows the CFA results for the internal latent variables BP, PI, SI, and CA.

**Table 3.** CFA analysis results for FS.

constructs	$\alpha$	AVE	CR	Manifest variables	loading	R <sup>2</sup>
Firm Strategy (FS)	0.79	0.52	0.76	Marketing Communication (x1)	0.73	0.53
				Quality control (x2)	0.81	0.65
				Sales strategy and budgeting (x3)	0.64	0.41

**Table 4.** CFA analysis results for BP, PI, SI, and CA.

Constructs	$\alpha$	AVE	CR	Manifest variables	loading	R <sup>2</sup>
Business Performance (BP)	0.96	0.82	0.90	Financial performance (y1).	0.95	0.91
				Non-financial results (y2).	0.86	0.74
Product Innovation (PI)	0.77	0.52	0.68	New product innovation (y3).	0.68	0.46
				Known new product (y4)	0.76	0.57
Service Innovation (SI)	0.70	0.41	0.67	New service channels (y5).	0.67	0.44
				Service platform (y6)	0.77	0.59
				Service channel consistency (y7)	0.44	0.19
Competitive Advantage (CA)	0.80	0.49	0.66	Competitor understanding (y8)	0.80	0.63
				Competitor analysis (y9)	0.59	0.34

Source: Authors' CFA analysis

## Effect Decomposition

The values from the total effect (TE) decomposition are detailed in Table 5 (Bollen, 1987), which also confirms that all the causal variables in the SEM had a positive effect on a Thai gem and jewellery firm's BP, which can be combined to explain the variance of the factors affecting BP ( $R^2$ ) by 77%. Additionally, the influence of the four latent variables on BF was shown to most influenced by FS (TE = .88), PI (TE = .60), CA (TE = .16), and SI (TE = .02).

**Table 5.** The interrelationships values between the latent variables

Dependent variables	$R^2$	Effects	Independent variables			
			FS	PI	SI	CA
Business Performance (BP)	.77	DE	0.05	0.55**	-	0.16*
		IE	0.83**	0.05	0.02	-
		TE	0.88**	0.60**	0.02	0.16*
Product Innovation (PI)	1.00	DE	1.00**	-	-	-
		IE	-	-	-	-
		TE	1.00**	-	-	-
Service Innovation (SI)	.67	DE	0.82**	-	-	-
		IE	-	-	-	-
		TE	0.82**	-	-	-
Competitive Advantage (CA)	.31	DE	-	0.33**	0.13	-
		IE	0.55**	-	-	-
		TE	0.55**	0.33**	0.13	-

Source: Authors' analysis, \*Sig. < 0.05, \*\*Sig. < 0.01, DE = direct effect. IE = indirect effect, TE = total effect

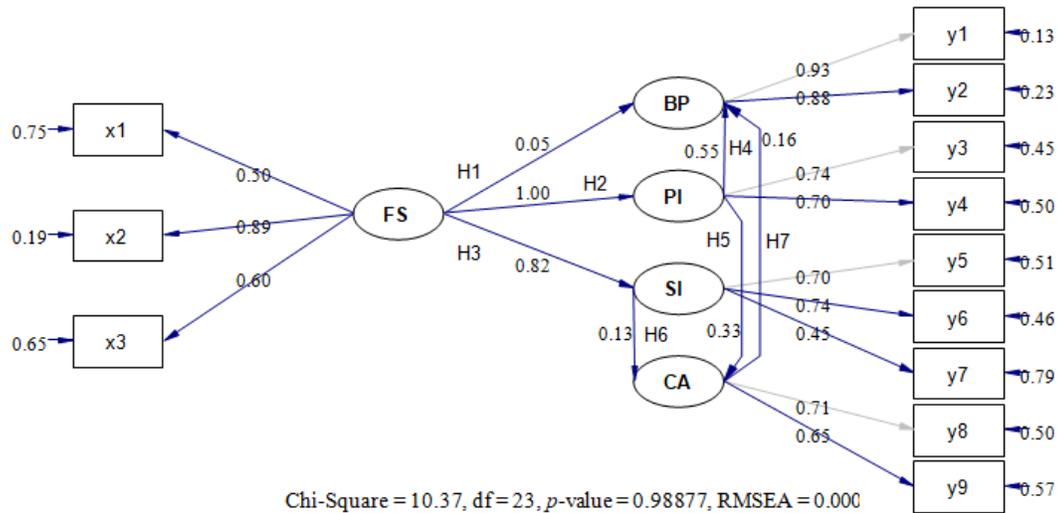
Additionally, Table 6 shows the SEM variables influence on BP.

**Table 6.** SEM variables influencing BP

Constructs	FS	PI	SI	CA	BP
Firm Strategy (FS)	<b>1.00</b>				
Product Innovation (PI)	.73**	<b>1.00</b>			
Service Innovation (SI)	.66**	.68**	<b>1.00</b>		
Competitive Advantage (CA)	.36**	.33**	.50**	<b>1.00</b>	
Business Performance (BP)	.68**	.55**	.60**	.41**	<b>1.00</b>
$\rho_V$ (AVE)	0.47	0.52	0.41	0.46	0.82
$\rho_C$ (construct reliability)	0.71	0.68	0.67	0.63	0.90
Square root of the AVE	0.68	0.72	0.64	0.67	0.90

Source: Authors' SEM analysis, \*\*Sig. < .01

Figure 3 and Table 7 present the details of the model's final hypotheses testing. Of the seven hypotheses conceptualized, two were found to be inconsistent and therefore unsupported by the data (H1 and H6).



**Figure 3.** Final Model for BP (Source: Authors' SEM analysis)

**Table 7.** Final testing of the hypotheses.

Hypotheses	Correlation coefficient ( <i>r</i> )	t-test	Consistency
H1 FS directly influences BP	0.05	0.62	Inconsistent
H2 FS directly influences PI	1.00	14.72**	Consistent
H3 FS directly influences SI	0.82	11.57**	Consistent
H4 PI directly influences BP	0.55	7.00**	Consistent
H5 PI directly influences CA	0.33	3.94**	Consistent
H6 SI directly influences CA	0.13	1.23	Inconsistent
H7 CA directly influences BP	0.16	2.43*	Consistent

Source: Authors' analysis, \*Sig. ≤ .05, \*\*Sig. ≤ .01

## Discussion

From the research to develop a causal model to investigate what influences the business performance of entrepreneurial firms within the Thai gem and jewellery industry, a determination was made that all the model's causal variables positively influenced BP, which can be explained by the 77% of the variance of the factors influencing BP ( $R^2$ ). Stated by the level of importance, factors influencing BP were FS, PI, CA and SI, with total effect [TE] values of 0.88, 0.60, 0.16 and 0.02, respectively. Discussion of the hypotheses interrelationships and their outcomes is detailed as follows:

### Firm Strategy (FS)

SEM analysis determined that for the conceptualized interrelationship between FS and BP, the results were inconsistent. thus, the hypothesis was unsupported. However, the interrelationship between FS and PI was extremely strong as  $r = 1.00$ , the t-test value = 14.72, and  $p \leq 0.01$ . H3 was also determined to have a very strong interrelationship between FS and SI as  $r = 0.82$ , the t-test value = 11.57, and  $p \leq 0.01$ .

Although H1 was rejected, the very strong importance of FS in H2 and H3 was demonstrated.



## Product Innovation (PI)

The interrelationship between PI and BP in H5 was shown to moderate as  $r = 0.55$ , the t-test value = 7.00, and  $p \leq 0.01$ . However, H6's interrelationship between PI and CA was shown to weak but positive as  $r = 0.33$ , the t-test value = 3.94, and  $p \leq 0.01$ .

Furthermore, of the items evaluated from the survey, entrepreneurs felt that new *product innovation* (y3) held the greatest importance as the mean = 4.26 and the S.D. = .62 (Table 8).

**Table 7.** Product innovation results

	Mean	SD.	Skewness	Kurtosis
Part 4 Product Innovation (PI)	4.19	.59	-.21	-.74
New product innovation (y3)	4.26	.62	-.23	-.94
New product introduction (y4)	4.13	.69	-.28	-.91

Source: Authors' analysis

## Service Innovation (SI)

Concerning service innovation (SI), H6's results were inconsistent and thus rejected as the interrelationship between SI and CA was extremely weak as  $r = 0.13$  and the t-test value = 1.23.

The reason for the rejection of the hypothesis most probably comes from the nature of the gem and jewellery business which has been described by some entrepreneurs as 'cutthroat', wherein information and connections are tightly controlled. Furthermore, most firms are widely dispersed in their operations, which can contribute to the perception for the lack of need for SI. This is consistent with a Spanish SME study in which it was determined that geographical proximity and institutional support plays an essential role SMEs building their technological competence and innovation capabilities (Albaladejo, 2002). It must be noted, however, that Thailand's Gemopolis was an effort to take advantage of firm 'clustering' but thus far; the number of firms located within the complex has been reported as no more than 200 (Temphairojana, 2016).

Additionally, as the industry is a 'touch and feel' process that appeals to the senses, owners appear to be slow to grasp the importance of digital media platforms for conveying information, shaping brand identity, and building customer relationships. Once again, according to McKinsey, two-thirds of luxury shoppers report they conduct online research before they make an in-store purchase, while up to two-thirds say they often use social media for advice and information (Dauriz et al., 2013).

## Competitive Advantage (CA)

In the model's final hypothesis, H7's interrelationship between CA and BP was also shown to be positive but very weak as  $r = 0.16$ , the t-test value = 2.43, and  $p \leq 0.05$ .

## Conclusion and Implications

The authors developed a study of the interrelationships and influences on a Thai gem and jewellery enterprise's business performance. From the research, four additional latent variables were identified. These included firm strategy (FS), product innovation (PI), competitive advantage



(CA), and service innovation (SI). Results showed an extremely strong interrelationship between a firm's strategy and product innovation. From the analysis of personal interviews with industry leaders, issues concerning the free movement of materials need to be addressed, with an example of Hong Kong often cited. Another factor often stated as a concern, is how and where a new generation of artisans can be found. Also, the need for continuing Thai government support is stated as a dire need. Also, non-financial performance measurements appeared to have more importance to the Thai gem and jewellery entrepreneur over traditional financial measurements. Finally, both domestic consumers and foreign tourists are seen as an essential market for future growth but tourism is very sensitive to outside factors such as trade wars, economic downturns, accidents, and the rise of other tourist destinations such as Cambodia and Vietnam also play a role in deviating tourism inflows.

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