

IMPACT OF COVID-19 PANDEMIC UPON JEWELRY AND GEMS BUSINESS: MARKETING MIXED PERSPECTIVE

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Abstract. The objective of this study was to determine the impact of the COVID-19 pandemic by examining the marketing mix strategy for Thai gem and jewelry businesses to find ways for business by exploring the marketing mix composition of 369 jewelry and gems businesses in Thailand. Marketing mix difference was tested by using Paired Samples t-test during pre-and post-COVID and tested the hypothesis using multiple regression analysis. Results found that COVID-19 epidemic has affected almost every marketing mix component (price, distribution, sales promotion, and product) with a statistically significant difference between pairs. Therefore, business units must emphasize and adjust their marketing mix in order to cope with new opportunities, such as creating a new platform for online sales, focusing on speed adaptation, and bringing more innovation to business in order to take advantage of this crisis.

Keywords: gems and jewelry, Thailand, marketing mix, entrepreneurs' adjustment, COVID-19.

JEL Classification: M310, L110, L250.

Introduction

The COVID-19 outbreak has resulted in physical lockdowns under the government's social distancing measures. Lockdowns influence consumer behavior (Donthu & Gustafsson, 2020). Home delivery, online shopping, and cashless payments are on the rise (Pantano et al., 2020). Changing customer behavior creates opportunities and limitations for businesses. It is therefore important for businesses to adapt during the COVID-19 crisis. Organizations that are agile and employ appropriate business strategies tend to survive and grow, while other companies that do not adapt will disappear (Chan & Muthuveloo, 2020). The company has to adjust its business methods to meet the new needs of customers during the crisis, for example, the product must be emphasized durability, and the price must be cheap to reduce expenses, etc. The company has to adjust its product offerings to emphasize its flexibility and adaptability of the company (Ritter & Pedersen, 2020).

Therefore, the right marketing strategy is essential during a crisis, such as developing new products and adding new innovative services in line with new customer needs, creating new values for customers rather than relying on past strengths (Rollins et al., 2014).

Companies that view crises as opportunities will yield superior business outcomes during and after crises (Lilien & Srinivasan, 2010). They not only survive crises but facilitate long-term and a good marketing strategy will help the company to adapt quickly and continuously to changes in the market (Kotler & Caslione, 2009). This affects the success of the company in the face of risks and challenges caused by the COVID-19 crisis (Fuciu, 2020). Most entrepreneurs want to survive and succeed from this uncertainty. What marketing strategy should be used to maintain company performance?

Although lockdown measures caused by the COVID crisis have a negative effect on business sales (Roggeveen & Sethuraman, 2020), a McKinsey study (2021) found that lockdown measures have a positive effect on Sales of luxury products including handbags, shoes, and jewelry. They were higher than the company forecast, for example, the Hermes brand had a 7% increase in total sales, and leather goods, apparel, watches, jewelry, and home goods are all showing a sales growth rate of up to 21% in 2020. The study shows that the behavior of consumers buying luxury products is different from other goods. That is, it depends on the consumption values that differ based on individual values, social status values, and

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personal utility values (Wiedmann et al., 2009). Consumption value affects consumers' characteristics and consumption patterns differently (Kim et al., 2019a). On luxury products, consumption value will depend on individual consumer behaviors. (Vigneron & Johnson, 1999; Faschan et al., 2020; Jung et al., 2021).

Therefore, this study is interested in examining luxury products in Thailand, namely gems and jewelry, and how it was affected by the COVID lockdown. The gems and jewelry industry is long-established in Thailand. It is of great importance to the development of the country's economy because the product generated income for Thailand at rank 1 in 5 of the export products for over a decade, with export value in 2019 of ranked 3, accounting for 6.37 percent of the total export value of Thailand – that is worth more than 486 billion baht. In addition, it is an industry that creates jobs and generates income for more than 1.2 million craftsmen and workers. It is a fully integrated manufacturing industry from upstream to downstream. Currently, Thai gems and jewelry products are recognized by buyers all over the world in raw materials, colored gemstones, craftsmen, and beautiful designs. Thailand is one of the world's major gems and jewelry trading centers (Department of Industrial Promotion, 2018). When the COVID-19 outbreak occurs, it also impacts the operations of Thai gems and jewelry businesses. To that end, businesses are looking for effective marketing strategies that they can deploy during the COVID-19 period. Each country has unique COVID restrictions and therefore the Gems and Jewelry industry needs unique marketing strategies to survive. Gem and jewelry business operators need to adjust and find new approaches or methods such as applying technology to support the production, as well as appropriate marketing strategies to keep up with the changes of today's consumers. For example, increasing online distribution channels during the COVID-19 situation (Sriorathaikul, 2020).

The marketing mix is an important marketing tool utilized in this research because it is a set of essential marketing decision-making elements (product, place, price, and promotion). Understanding the Marketing Mix helps the company understand its own market and potentially gain a competitive advantage. Gems and jewelry are classified as luxury products with different customers characteristics depending on their customer level and purchasing activity. Physical appearance and the creation of the product determine its value. Different distribution channels are set up according to customer groups, such as department stores, traditional luxury retailers, etc. In order to identify marketing strategy in the gem and jewelry industry during the crisis, this research aims to answer two questions: 1) How does the COVID-19 pandemic affect the gem and jewelry business' marketing mix? 2) What are the guidelines for adaptation the gem and jewelry business should take?

The benefits of this study will be important information for entrepreneurs in the gem and jewelry business in Thailand to understand ways to adjust their business to

the changing consumer behavior before and after COVID-19. It also provides in-depth information for marketing managers, through the marketing mix, the distribution channels, and the use of technology to distribute luxury goods. In the next section, we will be discussing theories and concepts related to the marketing mix, business model, and competitiveness. This will be followed by research methodology, including the presentation of research results, conclusions, and adaptation guidelines for the gem and jewelry industry.

1. Literature review

Past research (Sahani, 2020) found that recession led consumers to change their buying behaviors but did not influence their buying behavior on luxury products (Agrawal et al., 2021). During economic recessions, unemployment and falling income influence consumer purchases behaviour (Kaytaz & Gul, 2014). The company has experienced a decline in demand for its products, resulting in lower sales and profits (Jun et al., 2018). Marketing strategies and marketing mix to meet new customer needs and motivate them to increase their spending and maintain the company's market share (MacDonald & Dildar, 2020), for example, competitive pricing, better service, or increasing sales promotion. Increasing marketing expenditures during a recession, such as investing in R&D, creates opportunities for companies to increase sales and increase market share. (Ramon-Jeronimo & Herrero, 2017). This gave the company more assets in the post-recession. Market share increases three times faster than companies that cut their market budgets during the recession (Roberts, 2003) and improved market returns (Currim et al., 2016). For example, companies such as Walmart and Target continue to invest in marketing even in times of crisis and were successful in attracting new customers. Reducing marketing expenses during a recession significantly weakened the company (Rhodes & Stelter, 2009). The company will increase marketing investment during the economic boom and reduce the market budget during the crisis. Therefore, reducing the marketing budget will be effective in the short term and maintain shareholder confidence, but will lead to a number of problems in the long term, such as loss of sales, profits, and market share, that eventually will slow down the growth of the company during the recovery period. It takes a lot to recover from a loss. Retrenchment in times of crisis is imperative so that companies can maintain scarce resources and hope to survive until the economy recovers (Srinivasan et al., 2005).

1.1. Understanding the market through marketing mixed analytics

Changes in market environments, such as Covid-19, increase the complexity of business management. Entrepreneurs must use appropriate strategies to make rational decisions. Therefore, entrepreneurs must have a thorough understanding of the market. Market Mix is

an important tool for this purpose and has the following elements:

1.1.1. Product

Refers to a product that a business offers to meet the needs of customers and reach consumer satisfaction. Products consist of physical characteristics such as form, properties, quality, reliability, special appearance, design, and location. The product must have utility and value in the eyes of the customer. Businesses should focus on creating products that provide more value than customers expect, in order to sell the product. The gem and jewelry industry is divided into two parts: 1) Diamonds and cut gemstones, and 2) Jewelry consists of gem jewelry such as diamonds and colored gemstones, and valuable metal jewelry such as silver, platinum, and gold, usually made with 14 karat gold and sterling 925 (92.5% silver). The sample group for this research is segmented into genuine jewelry at 68.3%, diamonds at 19.5%, colored gemstones at 4.9% and artificial jewelry at 7.3% (see Table 1). Gems and jewelry products are diverse, as the consumption purpose depends on the individual dictating emotional and economic values. The industry accommodates consumption that varies according to individual consumption values (Wiedmann et al., 2009) by providing three main segments: A) Products that emphasize modern style and fast fashion, a quality product at the low-price level. This group of customers is teenagers who prefer jewelry products made of 14 K gold, silver jewelry, and light-colored gemstones. B) Products that focus on craftsmanship and modern design with attention to trademarks. The products are of high quality and affordably priced. This group of customers is working women who pick up jewelry products to go with their work attire. Example product segments are popular gold jewelry or silver jewelry decorated with precious gems. C) Jewelry products with high-quality decorations emphasize style and craftsmanship. It boasts an elegant design with the store's trademark focus. This customer segment has a good income. Popular products are diamonds, gold, and platinum Jewelry.

The rapid spread of COVID-19 is disrupting the daily economy of people around the world. Fears of COVID-19 infection and social distancing policies have changed the behavior of consumers, namely reducing participation in face-to-face contact, resulting in marketing mix changes. However, gems and jewelry products remain popular with the public, as the consumption of jewelry is unchanged during the recession. Consumers still have confidence in the products and the persistence of luxury goods based on personal and social values. Products that show social values as public self-consciousness carry uniqueness, pleasure, and quality as personal values, which are related to personal self-consciousness (Duong & Sung, 2021). Differences in perceived values will result in different purchasing behavior (Kim et al., 2019b). This thinking highlighted differences in luxury brands of gems and jewelry products. Gems and jewelry products

must keep up with the modern trend. Past research has suggested that during a recession businesses should stop producing non-profitable products (Ang, 2001), focus on producing durable products, and develop new product lines (Tsafarakis, 2016). High quality and tailored to customer goals and market needs are essential. Bringing in innovation will help the business gain a competitive advantage and survive in times of crisis (Ang, 2001; Srinivasan et al., 2011). Investing in R&D makes companies more successful than their competitors (Ramon-Jeronimo & Herrero, 2017). Creating a new product is highly efficient (Smith, 2011) because it adapts to the needs of new customers and retains existing customers, which can reduce sales and revenue uncertainty during a recession. Businesses should develop a wide range of new and cutting-edge products with reasonable prices, providing superior value to the customers. Packaging size can be developed to increase demand during the recession by standardizing product composition or packaging and reducing the number of sizes or packages offered (Kotler & Caslione, 2009). Increased customer service offerings during critical times meet changing customer preferences by innovating recession-based services, such as reducing costs (O'Malley et al., 2011), and reducing cash exposure through online payment systems. 3) There is a product quality guarantee for gems and jewelry. A genuine product is essential for consumers. Businesses issuing guarantee certificates provide consumers the confidence in the product they have just purchased. Therefore, this research considers Products mixed into 3 sub-components, namely, product diversity, products with the modern trend, and products that guarantee quality.

1.1.2. Price

Refers to the value of the product in monetary terms – it is the cost of the customer, but it's the part that generates income for the business. The Price mix is the most flexible because prices can change quickly, unlike product features or distribution channels. Although the current decade sees other factors not related to price having an increased influence on consumers, the price factor still plays an important role in determining the market share and profit of the company. The change in price will affect the purchasing decision during the crisis as consumers have lower income and less stability. Therefore, the consumer's focus is on cheaper prices (Hampson & McGoldrick, 2013). This mix is divided into three areas: 1) Price diversification. Price, therefore, has a greater influence on purchasing decisions during the crisis than the origin and quality of the product, two important factors in normal times (Rabadan et al., 2020). Lowering the price can lead to increased sales (Grundey, 2009). 2) Prices are reasonable. Price reductions are a risk that will be difficult to adjust when the economy recovers. The discount is therefore taken instead of the price reduction in order to maintain market share during the recession, however, will result in less profit. Reducing product quality and offering lower prices is another approach, yet it's a high

risk, since after the recession the customers may perceive the Company's products to be of inferior quality. Prices are set by factors used in production (e.g. craftsmanship cost, design cost), and the quality of raw materials used to make jewelry, such as precious metals (gold, silver, platinum) and gems (diamonds, gemstones).

Differences are based on the value of the goods that the customer wants. In addition, the price can depend on the style of jewelry under the trademark. These factors contribute to a wide range of prices for gems and jewelry items. The Covid-19 pandemic has resulted in a reduction in the consumption of common basic goods. But for gems and jewelry, consumption is increasing. This is due to individual differences in spending on luxury goods. Consumers are more confident in luxury goods consumption. Even during the COVID-19 epidemic, luxury goods continued to grow during the economic downturn. 3) In times of crisis, the price should be what the customer can afford. The price should be reasonable and offer customers superior value, with variety, flexibility, and dynamic. Some companies focus on reducing production costs and maintaining the original price level to meet customer needs. Pricing, therefore, incorporates a mix of other marketing initiatives. In terms of price, this research considers 3 elements: product prices are diverse, product prices are reasonable, and product prices are affordable.

1.1.3. Place

Refers to activities related to the movement of goods from the manufacturer to the desired place and at the right time. Determining the location to reach the consumer, especially specialized service that the consumer must obtain from the service provider at the location provided by the service provider, will determine the segment of consumers who will come to use the service. Therefore, the property must be able to cover the area in which to serve the desired group as much as possible. Businesses must find a location that is convenient to travel, close to the community, has sufficient parking, and has adequate facilities to meet the needs of customers. Therefore, the Place mix is about the distribution policy during a crisis. Companies should get rid of unprofitable channels and intermediaries and find out what is the most impactful channel. New channels should reduce operating costs and improve cooperation within diverse channels that influence company performance (Ang, 2001). Businesses should lower prices to shops or wholesalers, select a market in which the company has advantages in terms of scarce resources, and enter a profitable foreign market (Hassler, 2003). The gem and jewelry business has several distribution channels, namely: 1) Distributors, including importers, jewelry manufacturers, retailers, grinding factories, and investors who import gems and jewelry for resale in department stores and merchandise stores fashion accessories across the country. 2) Online channels such as online media, TV, brand jewelry platform, etc. To survive COVID-19, e-commerce channels

and various online media is where branded jewelry can respond to the rapidly changing lifestyles of consumers. Online distribution channels have grown (Eger et al., 2021). The digital marketplace is expected to grow by an average of 30% in 2020 and will continue to grow even higher for the next 5 years (McKinsey, 2021). As a result, the value proposition of Thai gems and jewelry businesses has also changed (Vatamanescu et al., 2021). The most popular online channel is BLUE NILE (<https://www.bluenile.com>) in the United States (National Gem and Jewelry Research and Development Institute, 2019). In Thailand, most of them are sold through social media (Facebook, Line, IG, and Twitter) and through platforms (Alibaba.com, Shopee, Amazon.com, etc). There is a convenient payment system in Thailand. Online sales channels are essential. This research considers 3 elements of distribution channels: Online distribution, Sales through distributors, and convenient payment methods.

1.1.4. Promotion

Is communication between sellers and buyers to create attitudes and buying behavior with the aim of informing or influencing buyers, such as promotional through television, the Internet, various media, trade fairs, and promotional campaigns on important holidays such as Mother's Day, Valentine's Day, and Christmas. Promotion is an activity in which companies try to reduce their advertising budget during a recession (Navarro, 2009) since it can reduce a large percentage of marketing budget cuts (O'Malley et al., 2011). Advertising reductions affect short-term revenue by increasing immediate margin and maintaining shareholder confidence only. The common marketing promotions in the gem and jewelry business are: 1) Information is communicated to customers online to reach customer satisfaction. By customizing interactions with consumers through data collection and analysis systems, businesses can see the needs of each group or individual and adjust products or services according to that need. This consisted of A) Information Customization – information that each consumer group or individual will receive. B) Transaction Customization – choice of purchase and delivery methods. C) Product Customization – consumers can design products according to their needs. And D) Service Customization. 2) Organizing promotions for consumers. During the crisis, demand for products and services decreased due to customers reducing their spending. Therefore, companies have reduced their advertising budgets because they believe that advertising will not increase sales dramatically (O'Malley et al., 2011). Conversely, maintaining or increasing advertising and promotion budgets during the recession helps increase both sales and market share (Graham & Frankenberger, 2011). This is better than increasing the marketing budget during the economic boom and reducing it during the recession (O'Malley et al., 2011). Online advertising is a new, highly cost-effective alternative (Papasolomou et al., 2016; Kirtis & Karahan, 2011). Invest in R&D, maintain

advertising costs, and expand brand exposure by focusing on improving online awareness (Rhodes & Stelter, 2009; Rollins et al., 2014). 3) Organizing international trade fairs. Gems and Jewelry fairs have changed in times of crisis. The format is now virtual. In 2021, Thailand has organized BGJF Virtual Trade Fair through an online channel to create opportunities for entrepreneurs to reach buyers and importers from all over the world in the New Normal era. It has become the world's important international gem and jewelry trading platform that continuously grows (Jiralertpong, 2021). More than 600 entrepreneurs participated, with more than 450 online business matching and appointments, carrying a trade value of more than 500 million baht. The platform featured online trade, organized seminars by the Gem and Jewelry Institute of Thailand, live streaming sales promotion, and interesting gem and jewelry trend information services. Therefore, it is considered a good strategy to shift marketing from traditional to electronic during the recession. Examples include social media marketing for business companies (Rollins et al., 2014), employee promotional activities, discount coupon offerings and celebrity use. This creates immediate value for customers, causing a positive impact on the efficiency of the company. Direct communication with customers created loyalty in times of economic crisis. This led to the development of new promotional methods that focused on efforts to reach customers and intermediaries during the recession. This research considered 3 elements of the Promotion mix informing customers online, providing promotions to consumers, and organizing various projects.

Past research studies on the impact of COVID-19 on the global economy include the (Ceylan et al., 2020) study on the impact of reducing consumption of fashion products (Chakraborty & Biswas, 2020), the impact on the food industry (Nakat & Bou-Mitri, 2021), the impact on the global supply chain and the tourism industry. The positive impact on businesses using a digital environment such as e-commerce is an opportunity to attract new customers (Eger et al., 2021). The impact of COVID-19 on the fashion retail market consumption of luxury goods occurred regardless of the economic crisis. A minority of luxury consumers consume more than 80% of luxury consumption. The market still has pent-up demand for luxury fashion products (Liu et al., 2021). Yet, there is no study on the impact of COVID-19 on the gem and jewelry industry, especially in Thailand.

2. Research methodology

The population used in the study was Thai gems and jewelry entrepreneurs, code 302XXX, registered with the Department of Export Promotion from The Thailand Ministry of Commerce, a total of 1,500 entities. The sampling process was calculated using the Krejcie Morgan formula (1970) at a 95% confidence level and with a 0.05 level of uncertainty on population size. A total of 376 respondents were sampled and quota sampling was

randomized by region (in Bangkok and other provinces). A total of 369 questionnaires were received, representing 92.25%, more than 20% was an acceptable response rate (Aaker et al., 2001). The tool used was a content-validated questionnaire by 5 experts with item objective congruence (IOC) greater than 0.5 for each question and passed the questionnaire reliability test with Cronbach's alpha coefficient greater than 0.07, which satisfied the questionnaire's accepted confidence value (Hair et al., 2006). Data analysis of the marketing mix opinion level was measured with a rating scale based on a 5-level Likert scale (Likert, 1967). The analysis was divided into 2 main parts: general data which used descriptive statistics with percentages, business data which used mean, standard deviation, and inferential statistics. The difference in marketing mix was tested by using Paired Samples t-test of gem and jewelry businesses pre and post-COVID and tested using multiple regression analysis.

3. Results and findings

From the group of respondents of the gem and jewelry business, it was found that the majority of women accounted for 65%, with males at 35% respectively. The respondents are Executive at 39%, and Manager level at 29.3% respectively.

On the business characteristics of the respondents, it was found that most of the businesses are genuine jewelry businesses 68.3% – separated into diamond businesses 19.5%, and gemstones 4.9% business. Business units that have a workforce of more than 100 people are as high as 51.2%, followed by business units with a workforce between 51–100 people at 34.1%. The business unit has been in business for more than 10 years are up to 80.5%. The majority of the nature of business is run as a company 74.8% and are sole proprietorship 17.1%. The investment value of the business of less than 10 million baht is up to 46.3%, the investment of over 50 million baht is at 29.3%. The average growth rate of net income in the proportion of 5–10% amounted to 41.5%. The business has the ability to cause expansion or growth in exports in the field of production at 48.8%. In terms of the nature of operations, there are businesses that have a clear operating structure. There is administrative power in the organization divided by function at 70.7%, centralized and decentralized management at 56.1%, high management focus at 53.7%. Digital use in organizations is used in designing products at 48.8%, followed by trade shows and online sales at 17.1%, and for off-chain control at only 12.2%, and “others” at only 4.9%. Consider the details in Table 1.

To classify the marketing mix by each aspect, it was found that Price aspect was at a high level. On the per-item basis, affordability of the product came first with the highest level of opinion ($\bar{X} = 4.39$, $SD = .794$). The promotion aspect was also at a high level, with online notifications coming first at ($\bar{X} = 3.75$ $SD = 1.216$). Place aspect was at a moderate level, with selling

Table 1. Business characteristics information of sample population

Information	Frequency (N = 369)	Percentage (%)
Organization type (genuine jewelry)	252	68.3
workers in the organization (more than 100)	189	51.2
Operation period (more than 10 years)	297	80.5
Business Type (company)	276	74.8
Initial investment (less than 10 million)	171	46.3
The average growth rate of net income as a percentage (5-10%)	153	41.5
The ability to expand or grow in exports (production)	180	48.8
Operating structure Clarity of executive power in the organization (on duty)	261	70.7
In-house management (consolidated and Decentralized)	207	56.1
Management in the organization (focus on work)	198	53.7
The use of digital in the organization (design)	180	48.8

products online coming first with a high level of opinion ($X = 3.68$, $SD = 1.335$). Finally, the Product aspect was at the highest level, which on the per-item basis shows that product quality assurance is first with the highest level of opinion ($\bar{X} = 4.37$, $SD = 1.008$). Thai gems and jewelry exports were also at a high level, and when considering the per-item basis, it was found that the sub-factors with the highest mean were the knowledge and experience of export operators ($\bar{X} = 4.26$, $SD = .718$).

The results of the examination of the components of the marketing mix (Product, Price, Place, and Promotion) concluded whether there was a difference between pre and post-COVID, using the Comparison of opinions of jewelers on marketing ingredients classified by composition with statistical analysis Paired Samples t-test. The research has the main hypothesis: The mean of all the components of the marketing mix in the period pre-and post-COVID is the same, and the secondary hypothesis: The mean value of all marketing mix components in the period pre and post-COVID is not the same. The results found that all sub-components of the marketing mix were: Price (product prices are diverse, product prices are reasonable, and product prices are affordable), Place (Online distribution, Sales through distributors, and convenient payment method), Promotion (informing customers online, providing promotions to consumers, and organizing various projects), and Products (product diversity, products with modern trend, and the products that guarantee quality). There was a statistically significant difference in pairs between pre-and post-COVID – at a significance level of 0.05 sig = .000, which is less than 0.01 indicating rejection of the main hypothesis. There

was a statistically significant difference between pairs at the .01 level, post-COVID which was lower than pre-COVID. Consider the accompanying Table 2.

Table 2. Result of the marketing mix's components paired test, pre-and post-COVID

Mk mix	Group	COVID	\bar{X}	SD	t	Sig
Price (P1)	Diverse	Pre-Post	3.76 3.54	1.24 0.966	3.96	.000
	Reasonable	Pre-Post	4.34 3.83	0.845 1.189	10.75	.000
	Affordable	Pre-Post	4.39 3.76	0.794 1.123	10.65	.000
Place (P2)	Online	Pre-Post	3.68 3.46	1.335 1.310	4.90	.000
	Branches/agents	Pre-Post	3.31 2.77	1.472 1.512	8.78	.000
	Easy pay	Pre-Post	3.37 3.12	1.576 1.437	4.39	.000
Promotion (P3)	Info online	Pre-Post	3.71 3.51	1.202 1.234	5.88	.000
	Promotion	Pre-Post	3.46 3.22	1.233 1.202	7.05	.000
	Project	Pre-Post	3.19 3.17	1.247 1.269	2.31	.021
Product (P4)	Variety	Pre-Post	4.07 4.00	0.895 0.827	2.19	.029
	Modern	Pre-Post	4.22 4.17	0.812 0.794	4.34	.000
	QA ass..	Pre-Post	4.37 4.17	1.007 1.011	7.42	.000

Note: \bar{X} – mean; S.D. – standard deviation.

The results of the hypothesis testing of the marketing mix pre- and post-COVID found that the main hypothesis was rejected, i.e. the average opinion level was different for all components of the marketing mix. Consider the accompanying Table 3.

Table 3. Results of the hypothesis testing of the marketing mix pre- and post-COVID

Comparison issues	t	p	Analysis Results	Meaning
Price (P1)	9.599**	.000	Reject H0	different
Place (P2)	5.644**	.000	Reject H0	different
Promotion(P3)	7.476**	.000	Reject H0	different
Product (P4)	5.688**	.000	Reject H0	different
Mk Mix	-3.101**	.002	Reject H0	different

Note: ** Statistical significance level at.01.

To find the relationship between marketing mix (Price, Place, Promotion, and Product) and gem and jewelry export capability, multiple regression analyses have been applied in this study. The results found that marketing mix affects gem and jewelry export capability at a 95% confidence level with statistically significant at

0.01 both pre and post-COVID. Considering the value of adjusted R square in both pre-and post-COVID at 68.4 and 85.9 respectively. It means that all marketing mix components can predict export capabilities up to 68.4 percent and 85.9 percent, respectively, and the rest was due to the influence of other variables. Consider the accompanying T4.

Table 4. Multiple regression analysis results of Market mix factors and exportability of Thai gem

	Model 1 (Pre-COVID)		
	B	t	sig
Constant coefficient	10.785	2.944	.003
P11 prices are diverse.	-.631	-1.453	.147
P12 reasonable price	3.143	3.073*	.002
P13 prices can afford	-3.255	-3.641**	.000
P21 inform online	.113	.117	.907
P22 organize a promotion	6.805	9.161**	.000
P23 organize a project	-1.525	-2.299*	.022
P31 online channel	.394	.757	.450
P32 branches or agents	.883	1.845	.066
P33 Convenient payment	-2.007	-6.832**	.000
P41 variety products	9.711	12.838**	.000
P42 Modern	6.301	6.123**	.000
P43 Quality insurance.	--5.476	-7.550**	.000
R-square	.696		
Adj R square	.684		
Std. EE.	6.46534		
RSS	30591.007		
F	60.986		
sig	.000		

Table 5. Multiple regression analysis results of Market mix factors and exportability of Thai gem

	Model 2 (Post-COVID)		
	B	t	sig
Constant coefficient	26.071		
P11 prices are diverse	6.43	9.739**	.000
P12 reasonable price	-2.639	-4.375**	.000
P13 prices can afford	-.081	-.164	.870
P21 inform online	-2.899	-5.483**	.000
P22 organize a promotion	6.788	15.232**	.000
P23 organize a project	-2.099	-6.306**	.000
P31 online channel	1.372	4.642**	.000
P32 branches or agents	.513	2.048*	.041
P33 Convenient payment	-1.818	-8.954**	.000
P41 variety products	7.711	19.240**	.000
P42 Modern	2.051	4.519**	.000
P43 Quality insurance.	-4.129	-13.046**	.000

Tables 4 and 5 show that all elements of the marketing mix affect gem and jewelry export capability at

a 95% confidence level and statistically significant at 0.01 and 0.05, except prices are diverse, inform online, online channel, branches or agents and in pre-COVID period and prices can afford in the post-COVID period. This can be explained: Price mix (reasonable price (P12) increase 1 unit, without the influence of other variables involved, this increases export capability by 3.14 unit and price can afford (P13) increase 1 unit decreases export capability by 3.2 unit.

In summary, the marketing mix factor that affects the gems and jewelry exports of Thailand over the pre and post-COVID period is almost all variables of the Price, Promotion, Place, and product aspect, which affects the ability to export with a statistical significance of 0.95 and 0.90. However, the factor namely prices are diverse, inform online, online channels, branches, or agents which are not significant in the pre-COVID period will get more attention in the post-COVID period. And in the post-COVID period ignore the price can afford variable.

Conclusions

From the analysis of the marketing mix of gem and jewelry business during the COVID-19 period, the weights are on the Promotion mix at 85.9%, especially marketing promotion (92.1%), project organizations (90.6%), through representative branches (89.7%), and online information notification services (87.3%), respectively.

Therefore, the adjustment of the gem and jewelry business during the COVID-19 period should be: to create a platform for buying and selling products online; increase promotional publicity in the online market and social media instead of traditional; offer customers discount coupons to drive sales, should build networking relationships with customers by providing information directly to customers; and emphasize distribution channels that find new profitable markets and reduce unnecessary expenses, such as more online channels; and allocate new resources to markets with higher competitive advantages.

From the global economic situation in 2019–20, the business should adjust their gem and jewelry business by maintaining stable export targets in order to wait for the crisis to be resolved and recover, organizing gems and jewelry fairs internationally, with online channels. This new channel can create opportunities for gem and jewelry manufacturers and traders, can show off their expertise in gem cutting, and has craftsmanship that is outstanding and can be trusted by customers. Businesses can build confidence in the quality of their products by using technologies such as Artificial Intelligence to help in production, design, creation, and provide services to increase customers satisfaction, and be able to eventually assess their customer behavior in order for the business to make data-driven decisions, arriving at the least risks. Businesses should increase online channels, promotions, and organize events to reach a wider range of customers, in order to create more confidence, increase demand for

new customers, meet the changing tastes of the new generation, and support the needs of customers of all ages.

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