

Qualtric Effect of TQM, Market Competitiveness, Organizational Innovation and Firm Performance

Herminawaty Abubakar^{a,1}, Iwan Perwira^{b,2}, Hasanuddin Remmang^{a,3}, Seri Suriani^{a,4}, Thanwain^{a,5},
Nur Naninsih^{c,6}

^a Universitas Bosowa, Makassar, Indonesia

^b STIM Lasharan Jaya, Makassar, Indonesia

^c STIE AMKOP, Makassar, Indonesia

¹herminawati.abubakar@universitasbosowa.ac.id, ²iwan@stimlasharanjaya.ac.id, ³hasanuddin.remmang@universitasbosowa.ac.id,
⁴seri.suriani@universitasbosowa.ac.id, ⁵thanwain@universitasbosowa.ac.id, ⁶nurnaninsih@gmail.com

ARTICLE INFO

Article history:

Received 12 June 2022

Revised 6 Nov 2022

Accepted 29 Dec 2022

Keywords:

TQM, Market Competitiveness,
Innovation, Firm Competitiveness

ABSTRACT

In TQM research in the property sector, several "research gaps" can be found, including: (1). Research focusing on the implementation of TQM in property companies in developing countries is still limited, so more Research is needed to understand how TQM is implemented and its impact on property companies in these countries. (2). Research that focuses on the implementation of TQM in property companies in the government context is still limited and needs to be expanded, especially to local governments. (3). Research focusing on implementing TQM in property project development is still limited and requires more Research to understand how TQM is implemented and its impact on property development projects; (3). Research that focuses on the impact of TQM implementation on building and environmental quality and consumer satisfaction levels still needs to be completed, especially in developing countries' property context. The result of this study state. (1). TQM and innovation: TQM can help companies to improve the quality of the products and services offered, which are the basis for innovation. By prioritizing quality, companies can more easily increase customer trust and improve corporate reputation, thereby increasing opportunities for innovation. (2). Innovation can help companies to improve the quality of products and services offered so as to increase added value for customers and increase customer confidence.

Copyright © 2022 International Journal of Artificial Intelligence Research.

All rights reserved.

I. Introduction

Global competition is getting tougher, forcing companies to continue to improve the quality of the products or services they produce and improve company performance to compete well in the global market. In the property business, companies must pay attention to the quality of project development, after-sales service, and building a quality and maintain a good company reputation (Caby et al., 2020). Global competition is getting tougher, forcing the Indonesian government to improve its infrastructure to attract foreign companies and investment. Good infrastructure development can improve people's quality of life and provide better job opportunities, which can help economic growth (Amoako-Gyampah et al., 2019). Good infrastructure development can also increase the demand for property because the demand for residential and commercial property will increase along with the increase in population and the need for business development. Pro-business government policies and the tax amnesty program offered by the government can also improve public interest in investing in the property sector, thereby increasing the sector's growth.

Since the global financial crisis in 2008, the property market in Indonesia has experienced ups and downs. Even though several years after the problem, the property market has recovered over the past few years (around 2018-2020), the property market has experienced a decline in demand (Ardekani et al., 2020; Bionda & Mahdar, 2017; Mitchell-Ketzes, 2003). This was due to several factors, including the economic slowdown, high-interest rates, and increased debt. Other factors also affect the property market, such as political uncertainty (Gabbe et al., 2021), unfavorable regulations

(Ardekani et al., 2020), and high financial burdens for home buyers, making it difficult for them to buy property (Palvia et al., 2020).

However, in several big cities in Indonesia, such as Jakarta, property market conditions tend to be stable compared to other cities. This is because the demand for property in big cities is higher than in other regions because big cities are business and economic growth centers. The Indonesian government has also issued several policies to boost growth in the property sector, such as reducing the tax burden and improving infrastructure. However, there are still several challenges that must be overcome to improve the condition of the property market in Indonesia. Some of these challenges include: (1). High financial burdens for homebuyers, such as high-interest rates and tax burdens; (2). Unfavorable regulations have complicated requirements and lengthy property buying processes; (3). High infrastructure gap between big cities and rural areas, causing difficulties in property development in the area; (4). The political and economic uncertainty can affect investors' interest in the property sector; (5). Low building quality due to a lack of good construction standards and less stringent licensing. To overcome these challenges, the government can increase pro-business regulations, improve the quality of infrastructure, and provide financial incentives for property development in rural areas. Then the government can also enhance good construction standards and strict licensing and increase the availability of funds for home buyers. In the long term, these improvements will increase investor interest in investing in the property sector and strengthen the stability of the property market in Indonesia.

The level of business competition in the property sector in Indonesia is relatively high. This is indicated by the increasing number of property developers and brokers operating in various regions. To compete well, business actors in the property sector must continuously strive to improve the quality of the products and services offered and innovate in terms of marketing and service delivery. Several ways to improve the quality of products and services provided include: (1) Paying attention to the building quality and meeting good construction standards; (2). Providing good after-sales service for consumers, including support in terms of property maintenance and repairs; (3). Provide good consultation to consumers regarding property selection that suits their needs and budget.

Meanwhile, to innovate in marketing and service delivery, several ways can be done: (1). Using technology to expand marketing reach and improve service efficiency; (2). Providing flexible financing programs to make it easier for consumers to buy property; (3). Providing loyalty or reward programs to increase consumer loyalty; (4). Doing these things can make business actors in the property sector able to compete well and win the competition in the market.

Problems with the quality of buildings that are built and do not meet good construction standards can be caused by several factors, for example; lack of supervision and regulation from the government in terms of building construction; lack of clear and strict construction standards enforced by developers; Lack of understanding and competence of contractors and workers involved in development projects (Ogedengbe, 2007); Budget cuts or cost savings made by developers to increase profit margins, thereby reducing the quality of the buildings built; construction of buildings without permits or invalid permits. These problems can have serious consequences, such as declining property sales values, health and safety issues for occupants, and difficulties with future property maintenance and repairs.

TQM (Total Quality Management) is a philosophy that focuses on improving the quality of products or services produced and overall company performance. TQM is applied in various industrial fields, including in the property sector. In the property sector, TQM can be used in several ways, including: (1). Property development: the developer must ensure that the buildings built meet good construction standards and meet consumer needs (Grover et al., 2004); (2). After-sales service: the company must provide good after-sales service to consumers, including support in terms of property maintenance and repairs (Murali et al., 2016); (Amiruddin & Modding, 2021; Murtini, 2021); (3). Marketing: companies must be able to provide accurate and precise information about the products or services offered, as well as flexible financing programs and good consulting services for consumers (Bicen & Hunt, 2012); (4). Project management: the company must manage development projects efficiently and on time and ensure that projects can be completed within the stipulated budget (Marjanova et al., 2015). By implementing TQM, companies can improve the quality of products or services and increase customer satisfaction, strengthening their position in the market (Brooks & Zeitz, 1999; Chae et al., 2014).

In TQM research in the property sector, several "research gaps" can be found, including: (1). Research focusing on the implementation of TQM in property companies in developing countries is still limited, so more Research is needed to understand how TQM is implemented and its impact on

property companies in these countries. (2). Research that focuses on the implementation of TQM in property companies in the government context is still limited and needs to be expanded, especially to local governments. (3). Research focusing on implementing TQM in property project development is still limited and requires more Research to understand how TQM is implemented and its impact on property development projects; (3). Research that focuses on the impact of TQM implementation on building and environmental quality and consumer satisfaction levels still needs to be completed, especially in developing countries' property context; (4). Research on implementing TQM in property companies regarding social and environmental aspects still needs to be completed. More Research is needed to understand how TQM is used in social and ecological contexts in property companies. Through Research focused on these research gaps, we can provide a better understanding of how TQM is applied in the property sector and its impacts, as well as valuable recommendations for the future development of the property sector.

Apart from that, market competition greatly influences the pattern of competition in the property sector. The property market in Indonesia is quite competitive, with many property developers and brokers operating in various regions. This competition can provide opportunities for property developers and brokers to improve the quality of the products and services offered and find ways to attract consumers' attention. In Research on market competitiveness in the property sector, several research gaps can be found, including Research that focuses on the analysis of market competitiveness in the property sector in developing countries is still limited, so more Research is needed to understand patterns of competition and factors affecting market competitiveness in these countries. Research focusing on market competitiveness analysis in the context of government is still limited and needs to be expanded, especially in local governments. Research that focuses on analyzing market competitiveness in specific property market segments, such as commercial property, housing, etc., is still limited and needs to be expanded. Research that focuses on analyzing market competitiveness in the context of online competition is still tiny and needs to be raised, especially in today's increasingly developing digital era. Research focusing on analyzing market competitiveness in the context of technology, such as proptech, is still limited and needs to be expanded (Azizah et al., 2022; Hasrat & Rosyadah, 2021; Ilyas & Mustafa, 2022).

The influence of TQM (Total Quality Management), market competitiveness, organizational innovation, and company performance are interrelated and influence each other (Grover et al., 2004). TQM implementation can assist companies in improving the quality of products or services produced and overall company performance. Organizational innovation can help companies improve efficiency and improve their competitive position in the market (Gameda & Lee, 2020). Market competitiveness can affect the company in determining the price, product quality, location, and offer differentiation. Company performance will increase if the company can implement good TQM and organizational innovation and compete in the market. These three factors contribute to the company's performance; TQM focuses on improving the quality of products or services produced and overall company performance (Firman et al., 2020; Nguyen & Nagase, 2021). Organizational innovation focuses on increasing efficiency and competitive positioning in the market. Market competitiveness focuses on market analysis and understanding, which is expected to assist companies in determining pricing strategies and product quality; Compete with its competitors (Grover et al., 2004).

Terziovski and Samson, in their research published in 1999 by (Moradi et al., 2022), examined the strength of the relationship between TQM practices (independent variable) and organizational performance (dependent variable) in a large random sample of manufacturing firms in Australia and New Zealand. This study found a significant relationship between TQM practices and organizational performance. They found that companies that implement TQM extensively and consistently perform better than companies that do not implement TQM or only apply it partially. Companies that want to improve their performance should implement TQM widely and consistently. This is important because TQM is not just a program or project but a philosophy that must be carried out in the long term to achieve optimal company performance.

Prajogo and Sohal, in their research published in 2003, found that TQM had a significant positive relationship with product quality and product innovation in a survey of 194 managers in Australia who worked in manufacturing and non-manufacturing companies. They found that companies that implement TQM extensively and consistently have better product quality and are more innovative than those that do not implement TQM or only apply it partially. This study suggests that implementing TQM can assist companies in improving product quality and product innovation to improve the company's competitive position in the market. This shows that TQM can assist companies

in improving product quality and innovation to offer superior and attractive products or services to consumers and improve the company's competitive position in the market (Prajogo & Sohal, 2003).

In their research published in 2013, Ebrahimi and Sadeghi stated that TQM was recognized as a strategic tool to achieve the highest performance and competitive advantage in a study of manufacturing companies in Iran. This study found that the implementation of TQM can assist companies in improving the quality of products or services produced, increasing the efficiency of business processes, improving company performance, and increasing the company's competitive position in the market. This research suggests that companies that want to improve their performance and competitive advantage must apply TQM widely and consistently. This is important because TQM is not just a program or project but a philosophy that must be carried out in the long term to achieve the highest performance and competitive advantage (Ebrahimi & Sadeghi, 2013).

Fields and Roman, in their research published in 2010, stated that the main advantage of TQM is to improve the quality of results for both customer and employee performance in a study involving companies in the United States. This study found that TQM can assist companies in improving the quality of products or services produced, increasing the efficiency of business processes, improving company performance, and increasing customer and employee satisfaction. Companies that want to improve the quality of results for both customer and employee performance should implement TQM widely and consistently. This is important because TQM is a philosophy that prioritizes quality from all aspects of the company and must be carried out in the long term to achieve optimal quality for customer and employee performance (Fields & Roman, 2010).

Chenhall and Moers, in research published in 2015, stated that innovation has an explicit direct effect by producing new products, services, and processes. This research shows that innovation can help companies create superior products or services and improve the efficiency of business processes. In addition, this research also finds that innovation indirectly influences organizations by influencing how they deal with their external environment, strategy, technology, and structure. Creation can assist companies in adapting to a changing external environment, improve corporate strategy, increase technological efficiency, and improve corporate structure. This shows that innovation is essential for creating new products or services and improving overall company performance (Chenhall & Moers, 2015).

Laitinen, Lämsiluoto, and Salonen, in research published in 2016, found that interactive budgeting, product innovation, and company performance are interconnected. In a study conducted on Finnish manufacturing companies. This research shows that interactive budgeting, which is a process that involves the active participation of all company members in budget planning, can improve product innovation and company performance. Product innovation is essential in improving company performance, especially in a competitive market. This research suggests that companies must pay attention to the budget process and involve all company members in the budget planning process. This will increase product innovation and company performance in the long run. Product innovation resulting from interactive budgeting can increase company competitiveness and performance (Laitinen et al., 2016). Several studies show the link between innovation and market competition in the property sector. Universiti Malaya by (Naala et al., 2017) published one interesting study in 2016. In this study, researchers analyzed the role of innovation in increasing the competitiveness of property companies in Malaysia. The research results show that innovation in products, processes, and services can improve the competitiveness of property companies and help them compete in an increasingly tight market.

Another interesting study was conducted by The Journal of Real Estate Finance and Economics (Lewis et al., 2003), which shows that innovation in the property sector plays a vital role in increasing market competitiveness. In this study, researchers analyzed several new housing projects in the United States and found that the more innovative projects tended to have a higher level of competition. In addition, another study from the Journal of Business Research also found that innovation in the property industry is essential in increasing market competition and improving company performance (Zhou et al., 2009). Researchers analyzed data from several property companies in China and found that more innovative companies have higher performance levels than those that are less innovative. Innovation is significant for developing the property industry, especially in increasing the competitiveness and performance of companies. But keep in mind this study is only a few examples, and the results from this study may not apply to every condition worldwide.

Several studies explain the relationship between market competition and company performance in the property sector. One interesting study was published by the Journal of Real Estate Finance and Economics in 2012 (Chung et al., 2012) and (Yunus et al., 2012). In this study, researchers analyzed

the performance of property companies in the United States and found that tighter market competition is associated with better company performance. This research also found that companies that take advantage of economies of scale tend to perform better than companies that do not.

Another interesting study was conducted by the Journal of Real Estate Research, which showed that tighter market competition in the property industry is associated with increased company performance. In this study, researchers analyzed data from several property companies in the United States. They found that companies operating in more competitive markets tend to have higher rates of return (An et al., 2012). In addition, research from the Journal of Real Estate Research also found that market competition in the property industry affects company performance by (Kim & Suh, 1993). Researchers analyzed data from several property companies in Japan. They found that companies operating in more competitive markets tend to have higher performance levels than those working in less competitive markets. Research shows that tighter market competition in the property sector can improve company performance. However, it should be noted that the results from this study may not apply to every situation worldwide and depend on factors such as geographic location and market conditions. Thus, a temporary idea can be given for the development of a hypothesis regarding the role of TQM on organizational innovation, market competition, and organizational performance as follows:

- H1: Property companies that apply TQM extensively and consistently will have better product quality and are more innovative than property companies that do not implement TQM or only apply TQM partially.
- H2: The better the implementation of TQM in a property company, the higher the innovation level of the company.
- H3: The better the implementation of TQM in a property company, the higher the level of market competitiveness of the company.
- H4: Property companies that are in a high market competition environment will have a higher level of innovation compared to property companies that are in a low market competition environment
- H5: Market competition can be a factor that mediates the relationship between the implementation of TQM and the performance of property companies, where property companies that implement TQM widely and consistently and are in an environment of high market competition will have better performance compared to property companies that do not implement TQM or only partially implementing TQM and being in a low market competition environment.
- H6: Innovation can be a factor that mediates the relationship between TQM implementation and property company performance. Property companies that implement TQM widely and consistently and have a high level of innovation will perform better than property companies that do not implement TQM or only implement TQM. TQM partially and has a low innovation rate

Based on the existing literature, TQM (Total Quality Management) is a philosophy that focuses on improving product and service quality through the process, customer improvement, and customer satisfaction. Organizational innovation is a process in which companies develop or implement new ideas in the production process, products, or services offered, and it can be expected to increase the company's competitiveness. Market competition is a situation that occurs when companies compete to achieve a larger market share, while company performance is measured based on the company's success in meeting predetermined goals.

The conceptual framework of this study can be explained by saying that TQM can increase organizational innovation through process and customer improvements, which in turn can increase market competition and company performance. Corporate innovation can improve the competitiveness of companies and enhance their competitive market position. Tighter market competition can motivate companies to improve performance, especially in the property sector. Therefore, TQM, organizational innovation, market competition, and firm performance are expected to be related and will be tested in this study (see Figure 1).

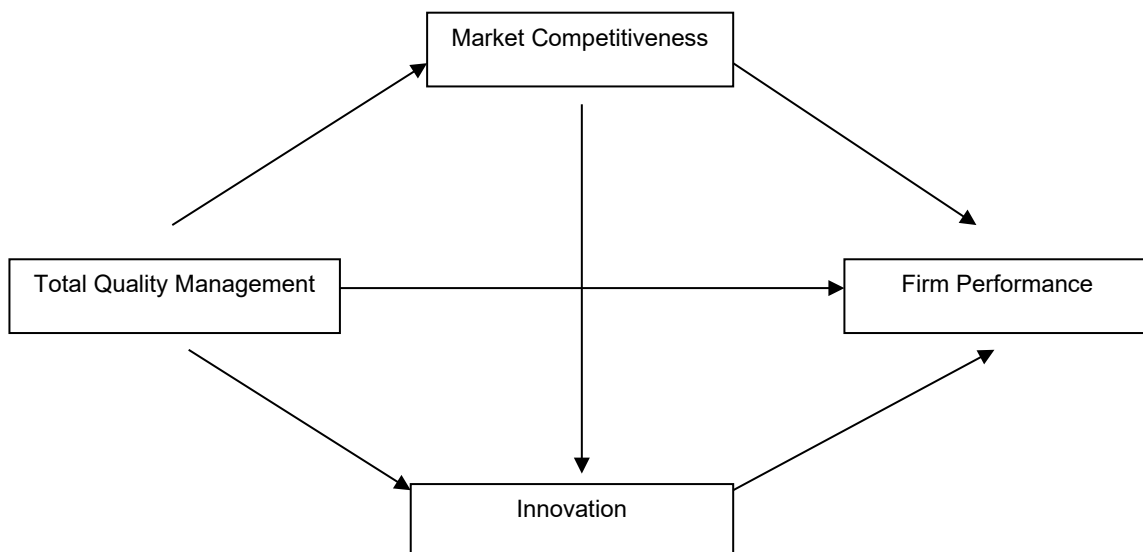


Figure 1. Conceptual Framework

II. Methods

Research Design

Based on the conceptual framework, this quantitative research design will use the Structural Equation Modeling (SEM) method using SmartPLS software to examine the relationship between TQM, organizational innovation, market competition, and company performance in the property sector. The data used will be obtained through a questionnaire that will be sent from property companies operating in the territory of Indonesia. The population in this study is the PT.X company, a national-scale property developer with several projects developed in 43 major cities in Indonesia. The basis for selecting this population is based on the distribution of companies in 43 cities throughout Indonesia, which will cause different environmental influences that support the contingency theory in implementing the Total Quality Management system. The unit of analysis for this research is the manager or head of a manager-level section. The sample in this study was selected by purposive sampling method, determining the selection from the existing population based on specific criteria, namely: holding the position of manager and/or head of department for at least two years, with the consideration that these managers are accustomed to working directly with subordinates.

Research Method

Data analysis will be carried out using SmartPLS SEM to test the validity and reliability of the constructs used, as well as to test the hypotheses formulated in this study's conceptual framework. Thus, the results of this study are expected to provide an overview of how TQM, organizational innovation, market competition, and company performance are interrelated and influential in the property sector. The stages of testing the validity and reliability of the data are by observing the loading-factor value and Cronbach's alpha with criteria > 0.60 , then the AVE value and composite reliability with a tolerance limit of > 0.60 (Chin & Dibbern, 2010; F. Hair Jr et al., 2014; Joseph F. Hair, Jr., G. Thomas M. Hult, Christian M. Ringle, 2013). Meanwhile, if the loading-factor weight is found for items that are < 0.60 , then the item is removed from the outer model testing stage. The next step is testing the hypothesis by observing the t-statistic value, where the error value is expected to be < 0.05 or $(p < 0.05)$.

Operational Definition and Measurement of Variables

Total Quality Management is a systematic approach to integrating all organizational functions and processes to continuously improve the quality of goods or services to achieve customer satisfaction. The seven factors studied are (1) customer focus and satisfaction; (2) training; (3) leadership and top management commitment; (4) teamwork; (5) employee involvement; (6) continuous improvement; and (7) quality information and performance measurement. Product innovation is considered the development and launch of new products (Higgins, 1996); Its measurement is taken from instruments developed by (Capon et al., 1992) and (Scott & Tiessen, 1999) as applied in accounting research by (Bisbe & Otley, 2004). when a firm launches and modifies products in a given period, e.g., over the previous three years, how often the firm produces products for the first time on the market, and the percentage of new products in the product portfolio. The intensity of market competition. The intensity of market competition is measured by a four-item instrument adapted from (Jin et al., 2016; Reshetko et al., 2021). the intensity of price competition, the intensity of product competition (differentiation), promotion, and product distribution. Market competition is measured by a survey, where respondents will be asked to indicate the intensity of market competition in their company by using a seven-point Likert-type scale, where point 1 strongly disagrees and point 5 strongly agrees. Firm performance can be measured along several dimensions, such as; worker satisfaction, productivity, customer service indicators, or job errors. The basic question items regarding these performance criteria were adapted mainly from the research of (Narver & Slater, 1990; Nurhilalia et al., 2019; Ramírez-Solis et al., 2022). Measurement was done by survey using a 5-point Likert scale, where point 1 indicates strongly disagree, 2 = disagree, 3 = similar, 4 = agree, and 5 = strongly agree.

III. Result and Discussion*Research result**a. Respondent Demographic Data*

In this section is the stage of data analysis and discussion of research results. The first step is to extract the demographic data of the respondents, which includes the frequency distribution based on the respondent's educational background, age interval, and data extraction of statistical data processing results. The following below presents a variety of research data interpretations. All respondents have positions as Project Manager (PM), General Manager (GM), Head of Marketing, Supervision, Branch Manager, Project Director, Marketing Staff, Finance Staff, Sales Executive and Project Coordinator.

Table 1. Demographic Data Based on Gender

Gender	Total	%
Man	73	69,5
Woman	32	30,5
Total	105	100

Based on table 1, the gender of the respondents was mostly male (69.5%) and female (30.5%).

Table 2. Demographic data based on education level

Education Level	Total	%
Diploma	7	6,6
Bachelor	73	69,5
Magister	21	20
Others	4	3,8
Total	105	100

Based on table 2, it can be seen that the level of education for respondents in this study is mostly from the S1 education level, namely with a portion of 69.5% and S2 as much as 20% of the total 105 respondents.

Table 3. Demographic Data by Age

Age (Years)	Total	%
< 30	17	16,1
31 – 40	48	45,71
41 – 50	33	31,4
>50	7	6,6
Total	105	100

Based on table 3, the age of respondents in this study is mostly from the age level of 31-40 years (45.71%) and aged between 41-50 years (31.4%). While the age range below 30 years has a percentage of 16.1%.

b. Statistic Result

Tabel 4. Validity and Reliability Result

Variables	Item	Loading Factors	Cronbach Alpha	Composite Reliability	AVE	Info
TQM	TQM1	.789	.937	.946	.638	Valid and Reliable
	TQM2	.781				
	TQM3	.809				
	TQM4	.788				
	TQM5	.787				
	TQM6	.792				
	TQM7	.859				
	TQM8	.778				
	TQM9	.772				
	TQM10	.829				
Market Competitiveness	MC1	.700	.870	.873	.677	Valid and Reliable
	MC2	.775				
	MC3	.814				
	MC4	.781				
	MC5	.804				
	MC6	.797				
Innovation	I1	.855	.922	.955	.628	Valid and Reliable
	I2	.865				
	I3	.876				
	I4	.866				
	I5	.705				
	I6	.677				
	I7	.742				
	I8	.721				
Firm Competitiveness	FC1	.844	.898	.919	.690	Valid and Reliable
	FC2	.821				
	FC3	.679				
	FC4	.634				
	FC5	.826				
	FC6	.717				
	FC7	.759				
	FC8	.791				

The results shown in table 4 explain that the TQM variable with a total of 10 measurement items; variable market competitiveness, variable innovation; and variable firm competitiveness has an overall loading factor value > 0.60 , this means that in the outer model measurement the item is declared valid. Likewise, the Cronbach alpha coefficient, composite reliability and AVE value have met the standard measurement criteria. Thus, at the outer model measurement stage, it can be stated that the items and variables are valid and reliable. Therefore, the next stage is the measurement of discriminant validity variables which explain the relationship between each variable as described in table 5.

Table 5. Discriminant Validity

	Firm Competitiveness	Innovation	Market Competitiveness	TQM
Firm Competitiveness	0.768			
Innovation	0.522	0.792		
Market Competitiveness	0.693	0.704	0.779	
TQM	0.720	0.705	0.907	0.799

Discriminant validity is a test to evaluate whether a scale or measurement instrument has an insignificant correlation with other scales or measurement instruments. This is important to check because if a scale or measurement instrument has a significant correlation with another scale or measurement instrument, it indicates that the scale or measurement instrument may not measure what is expected. Several methods are used to test discriminant validity, one of which is to evaluate the correlation between different scales or measurement instruments or the difference in variance between different scales or measurement instruments. For example, as shown in Table 5, the correlation of Firm competitiveness to other variables is 52.2%, 69.3% to market competitiveness, and 72% to TQM. The correlation of innovation to other variables also has a significant impact, for example, on the market competitiveness variable by 70.4% and 70.5% on TQM. Then a very significant thing is shown by the correlation between the TQM variable and market competitiveness of 90.7%.

Table 6. Model Fit

	Saturated Model	Estimated Model
SRMR	0.096	0.096
d ULS	4.896	4.896
d G	2.212	2.212
Chi-Square	106.913	106.913
NFI	0.659	0.659

SRMR (Standardized Root Mean Square Residual) is a measure used to evaluate model quality in structural equation modeling (SEM) analysis. SRMR measures how well the SEM model is able to explain the variance of the data tested. Threshold SRMR criteria (< 0.80 and $NFI > 0.90$). The results shown in table 6 which explain the fit model in the SRMR section are declared fit ($0.096 < 0.80$) but the NFI section shows that the threshold coefficient is $0.659 < 0.90$; therefore it can be assumed that the NFI model in explaining the variance is not so good. It can be assumed that the very complex overloading value does not go together with the AVE and composite reliability values which are > 0.70 . D_ULS (Unweighted Least Squares with Desired Loadings) is a method used in structural equation modeling (SEM) analysis using SmartPLS software. This method uses Unweighted Least Squares (ULS) to calculate model parameters by assuming that the measured constructs have a normal distribution. D_ULS is used to calculate the desired loadings of the items measured in the construct. The D-ULS value in this study shows $4.89 > 0.05$ so that it can be interpreted that the measured model parameters are normally distributed.

Table 7. R-Square

	R Square	R Square Adjusted
Firm Competitiveness	0.527	0.520
Innovation	0.521	0.516
Market Competitiveness	0.823	0.822

R-square is a measure used to gauge how well the model built is able to explain the variance of the data tested. R square is calculated as a percentage of the variance of the data explained by the model. The greater the R square value, the better the model is at explaining the variance of the data. R square in SmartPLS is used to evaluate the quality of the model built in SEM analysis. In general, a good R square in SmartPLS is expected to be above 0.7. The results shown in the R-Square value state that only one variable has an R-Square value > 0.70, namely market competitiveness.

Table 8. Uji F

Item	F-Test	Sig. Level
Simultaneous Test Equation 1 (TQM → Market Competitiveness)	132,446	0.000 < 0.01
Simultaneous Test Equation 2 (TQM → Market Competitiveness Through Innovation)	86.829	0.000 < 0.01
Simultaneous Test Equation 3 (TQM → Market Competitiveness → Innovation → Firm Performance)	59.922	0.000 < 0.01

Table 8 shows that the independent variables when tested together through various equation models on the dependent variable still get significant results < 0.01.

Table 9. Structural Equation Model Result

Item	koefisien β	t	Error	Sig. Level	Info
TQM → Market Competitiveness	2.632 (const) 0.523	13,156	0.047	0.000 < 0.01	Accepted
TQM → Innovation	-0.443 (const) 0.390	8.396	0.089	0.000 < 0.01	Accepted
Innovation → Market Competitiveness	-0.443 (const) 0.655	6.213	0.126	0.000 < 0.01	Accepted
TQM → Firm Performance	0.682 (const) -0.005	-1.043	0.107	0.966 > 0.05	Not Accepted
Market Competitiveness → Firm Performance	0.682 (const) 0.609	6.900	0.156	0.000 < 0.01	Accepted
Innovation → Firm Performance	0.682 (const) 0.515	4.913	0.109	0.000 < 0.01	Accepted
TQM → Market Competitiveness → Firm Performance	0.523 0.609	4.683	0.047 0.156	0.000 < 0.01	Accepted
TQM → Innovation → Firm Performance	0.390 0.515	4.212	0.089 0.109	0.000 < 0.01	Accepted

Based on the results of the regression test analysis in table 9, the regression equation formed is as follows:

- H1 = TQM affects market competition ($X1 \rightarrow Y1$)
 $Y1(\text{Market Competitiveness}) = \beta(2.632) + \beta(0.523) + 0.047e$
 $= 3.202$
- H2 = TQM effect on Innovation ($X1 \rightarrow Y2$)
 $Y2(\text{Innovation}) = \beta(-0.443) + \beta(0.390) + 0.089e$
 $= 0.436$
- H3 = Innovation affects market competition ($Y2 \rightarrow Y1$)
 $Y1(\text{Market Competition}) = \beta(-0.443) + \beta(0.655) + 0.126e$
 $= 0.738$
- H4 = TQM effect on firm Performance ($X1 \rightarrow Y3$)
 $Y3(\text{Company Performance}) = \beta(0.682) + \beta(-0.005) + 0.107e$

$$= 0.784$$

- H5 = Market competition affects Firm performance ($Y1 \rightarrow Y3$)
 $Y3(\text{Company Performance}) = \beta(0.682) + \beta(0.609) + 0.126e$
 $= 1.417$
- H6 = Innovation affects firm performance ($Y2 \rightarrow Y3$)
 $Y3(\text{Firm Performance}) = \beta(0.682) + \beta(0.515) + 0.109e$
 $= 1.306$
- H7 = TQM effect on company performance by making market competition a moderating variable ($X1 \rightarrow Y1 \rightarrow Y3$)
 $Y1(\text{Firm Performance}) = \beta(0.523) + \beta(0.609) + 0.047e1 + 0.156e2$
 $= 1.335$
- H8 = TQM effect on company performance by making innovation a moderating variable ($X1 \rightarrow Y2 \rightarrow Y3$)
 $Y1(\text{Firm Performance}) = \beta(0.309) + \beta(0.515) + 0.089e1 + 0.109e2$
 $= 1.022$

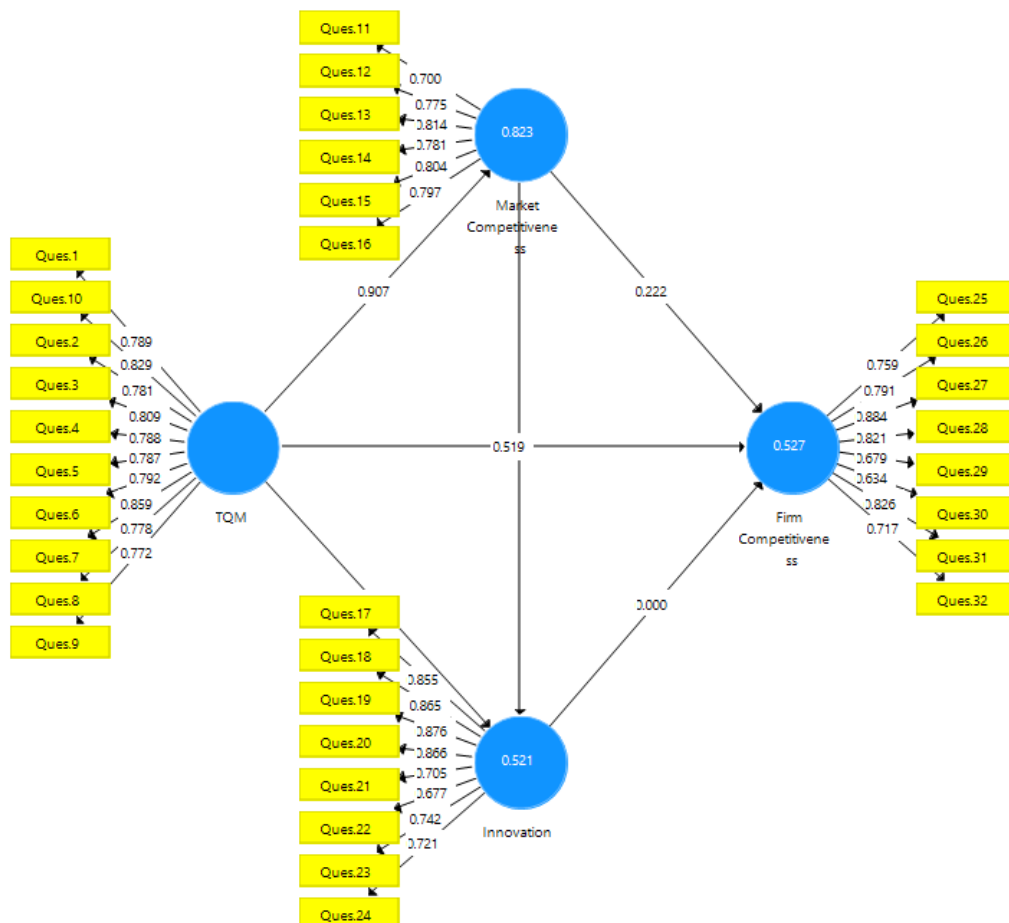


Figure 2. SEM Result

Discussion

Total Quality Management (TQM) is an organizational philosophy that focuses on product and service quality and overall company performance. Several studies show that implementing TQM can increase a company's competitiveness in the market. This can happen because TQM improves the quality of products and services, lowers costs, increases efficiency, and increases customer satisfaction. TQM implementation can increase a company's competitiveness in the market because it can help improve product and service quality, reduce costs, increase efficiency, and increase customer satisfaction. By increasing the quality of products and services, companies can differentiate themselves from competitors and increase customer loyalty. Cost reduction can be obtained by reducing waste and increasing the efficiency of the production process. Efficiency can be increased by streamlining the production process and improving department communication. Customer satisfaction can be increased by improving product and service quality and making customers feel valued. However, it should be noted that implementing TQM only sometimes leads to a significant increase in company performance, depending on factors such as organizational commitment, quality of training, and proper implementation of TQM. Thus, as shown in the results of the demonstration test between variables where TQM has no positive and significant effect on firm performance.

By implementing TQM, companies can improve their operational efficiency and effectiveness and customer satisfaction. In the real estate industry, TQM can be used to improve the quality of products and services offered to help companies be more innovative in increasing added value for customers. In addition, by prioritizing quality, companies can more easily increase customer trust and improve company reputation. Innovation and TQM are closely related in real estate companies. TQM can help companies improve their operational efficiency and effectiveness and increase customer satisfaction, which is the basis for innovation. Innovation can be realized in various forms, such as new products, processes, or services that can provide added value for customers. By implementing TQM, companies can ensure that the innovations realized follow established quality standards and provide optimal customer benefits.

Besides that, innovation and market competitiveness are closely related in the real estate industry. Innovation can help companies improve the quality of the products and services offered to increase customer value and customer trust. Innovation can also help companies improve operational efficiency and reduce costs, thereby increasing company profitability. In particular, innovation in real estate products can make companies more competitive in the marketplace. For example, by offering homes that are more energy efficient or have better safety features, companies can increase the added value of their products and their competitiveness in the market. Innovation can also be carried out in processes, for example, by increasing the efficiency of making or selling property. Companies can reduce costs and increase their competitive advantage. Innovation can help real estate companies improve the quality of products and services offered, improve operational efficiency and increase customer value. All of this can make the company more competitive in the market and help it increase its market competitiveness while also increasing its performance. **Theoretical implications** between TQM, innovation, market competitiveness, and firm performance in real estate companies include:

1. TQM and innovation: TQM can help companies to improve the quality of the products and services offered, which are the basis for innovation. By prioritizing quality, companies can more easily increase customer trust and improve corporate reputation, thereby increasing opportunities for innovation.
2. Innovation and market competitiveness: Innovation can help companies to improve the quality of products and services offered so as to increase added value for customers and increase customer confidence. Innovation can also help companies improve operational efficiency and reduce costs, thereby increasing company profitability and increasing competitiveness in the market.
3. TQM, innovation, market competitiveness, and firm performance: TQM can help companies to improve the quality of the products and services offered, which are the basis for innovation. Innovation can help companies to improve the quality of the products and services offered so as to increase added value for customers and increase customer trust. Innovation can also help companies improve operational efficiency and reduce costs, thereby increasing company profitability and increasing competitiveness in the market. All of these

can make the company more competitive in the market and help the company to improve its firm performance.

Overall, TQM, innovation, market competitiveness, and firm performance are interrelated and complementary; good implementation of TQM can help companies to increase innovation and increase market competitiveness, which in turn can help companies to improve their firm performance. **Managerial Implications:** Implementation of Total Quality Management (TQM) can assist companies in increasing innovation and market competitiveness. TQM focuses on improving the quality of products and services through improving process quality and a commitment to excellence. Innovation can be obtained by identifying and overcoming existing problems in the process, as well as increasing the efficiency and effectiveness of the process. Market competitiveness can be increased by increasing the quality of products and services offered. Real Estate companies that implement TQM can improve company performance by increasing customer satisfaction, increasing operational efficiency, and increasing market competitiveness. This can help companies in increasing revenue and profitability. However, the implementation of TQM needs to be followed by appropriate actions to measure and evaluate company performance in order to find out whether efforts to improve quality have achieved the expected results.

IV. Conclusion

The implementation of Total Quality Management (TQM) can help companies increase innovation, market competitiveness, and company performance. TQM focuses on improving the quality of products and services through improving process quality and commitment to perfection. Innovation can be obtained by identifying and addressing problems in the process, and improving the efficiency and effectiveness of the process. Market competitiveness can be improved through improving the quality of products and services offered. TQM implementation can improve company performance by increasing customer satisfaction, improving operational efficiency, and increasing market competitiveness. This can help companies increase revenue and profitability. However, the implementation of TQM needs to be followed by appropriate measures to measure and evaluate the company's performance, in order to know whether efforts to improve quality have achieved the expected results.

References

- [1] Amiruddin, Y. P., & Modding, B. (2021). Determination of Distribution Channel Marketing and Service Innovation Quality in Increasing Consumer Satisfaction. *Golden Ratio of Mapping Idea and Literature Format*, 1(2), 169–180.
- [2] Amoako-Gyampah, K., Boakye, K. G., Adaku, E., & Famiyeh, S. (2019). Supplier relationship management and firm performance in developing economies: A moderated mediation analysis of flexibility capability and ownership structure. *International Journal of Production Economics*, 208, 160–170. <https://doi.org/https://doi.org/10.1016/j.ijpe.2018.11.021>
- [3] An, H., Hardin, W., & Wu, Z. (2012). Information asymmetry and corporate liquidity management: Evidence from real estate investment trusts. *The Journal of Real Estate Finance and Economics*, 45(3), 678–704.
- [4] Ardekani, A. M., Distinguin, I., & Tarazi, A. (2020). Do banks change their liquidity ratios based on network characteristics? *European Journal of Operational Research*, 285(2), 789–803. <https://doi.org/https://doi.org/10.1016/j.ejor.2020.02.011>
- [5] Azizah, F. D., Nur, A. N., & Putra, A. H. P. K. (2022). Impulsive Buying Behavior: Implementation of IT on Technology Acceptance Model on E-Commerce Purchase Decisions. *Golden Ratio of Marketing and Applied Psychology of Business*, 2(1), 58–72.
- [6] Bicen, P., & Hunt, S. D. (2012). Alliance market orientation, new product development, and resource advantage theory. *Journal of Business and Industrial Marketing*, 27(7), 592–600. <https://doi.org/10.1108/08858621211257365>

- [7] Bionda, A. R., & Mahdar, N. M. (2017). Pengaruh Gross Profit Margin (GPM), Net Profit Margin (NPM), Return On Asset (ROA), dan Return On Equity (ROE) Terhadap Pertumbuhan Laba Pada Perusahaan Property Yang Terdaftar di Bursa Efek Indonesia (BEI) Periode 2012-2016. *Jurnal Bisnis Dan Komunikasi*, 4(1), 10–16.
- [8] Bisbe, J., & Otley, D. (2004). The effects of the interactive use of management control systems on product innovation. *Accounting, Organizations and Society*, 29(8), 709–737.
- [9] Brooks, A., & Zeitz, G. (1999). The effects of total quality management and perceived justice on organizational commitment of hospital nursing staff. *Journal of Quality Management*, 4(1), 69–93. [https://doi.org/https://doi.org/10.1016/S1084-8568\(99\)80096-0](https://doi.org/https://doi.org/10.1016/S1084-8568(99)80096-0)
- [10] Caby, J., Ziane, Y., & Lamarque, E. (2020). The determinants of voluntary climate change disclosure commitment and quality in the banking industry. *Technological Forecasting and Social Change*, 161, 120282. <https://doi.org/https://doi.org/10.1016/j.techfore.2020.120282>
- [11] Capon, N., Farley, J. U., Lehmann, D. R., & Hulbert, J. M. (1992). Profiles of product innovators among large US manufacturers. *Management Science*, 38(2), 157–169.
- [12] Chae, B. (Kevin), Yang, C., Olson, D., & Sheu, C. (2014). The impact of advanced analytics and data accuracy on operational performance: A contingent resource based theory (RBT) perspective. *Decision Support Systems*, 59, 119–126. <https://doi.org/https://doi.org/10.1016/j.dss.2013.10.012>
- [13] Chenhall, R. H., & Moers, F. (2015). The role of innovation in the evolution of management accounting and its integration into management control. *Accounting, Organizations and Society*, 47, 1–13.
- [14] Chin, W. W., & Dibbern, J. (2010). Handbook of Partial Least Squares. *Handbook of Partial Least Squares*, 171–193. <https://doi.org/10.1007/978-3-540-32827-8>
- [15] Chung, R., Fung, S., & Hung, S.-Y. K. (2012). Institutional investors and firm efficiency of real estate investment trusts. *The Journal of Real Estate Finance and Economics*, 45(1), 171–211.
- [16] Ebrahimi, M., & Sadeghi, M. (2013). Quality management and performance: An annotated review. *International Journal of Production Research*, 51(18), 5625–5643.
- [17] F. Hair Jr, J., Sarstedt, M., Hopkins, L., & G. Kuppelwieser, V. (2014). Partial least squares structural equation modeling (PLS-SEM). *European Business Review*, 26(2), 106–121. <https://doi.org/10.1108/EBR-10-2013-0128>
- [18] Fields, D., & Roman, P. M. (2010). Total quality management and performance in substance abuse treatment centers. *Health Services Research*, 45(6p1), 1630–1649.
- [19] FIRMAN, A., PUTRA, A. H. P. K., MUSTAPA, Z., ILYAS, G. B., & KARIM, K. (2020). Re-conceptualization of Business Model for Marketing Nowadays: Theory and Implications. *The Journal of Asian Finance, Economics and Business (JAFEB)*, 7(7), 279–291.
- [20] Gabbe, C. J., Kevane, M., & Sundstrom, W. A. (2021). The effects of an “urban village” planning and zoning strategy in San Jose, California. *Regional Science and Urban Economics*, 88, 103648. <https://doi.org/https://doi.org/10.1016/j.regsciurbeco.2021.103648>
- [21] Gameda, H. K., & Lee, J. (2020). Leadership styles, work engagement and outcomes among information and communications technology professionals: A cross-national study. *Heliyon*, 6(4), e03699. <https://doi.org/https://doi.org/10.1016/j.heliyon.2020.e03699>
- [22] Grover, S., Agrawal, V. P., & Khan. (2004). A digraph approach to TQM evaluation of an industry. *International Journal of Production Research*, 42(19), 4031–4053. <https://doi.org/10.1080/00207540410001704032>
- [23] Hasrat, T., & Rosyadah, K. (2021). Usability Factors as Antecedent and Consequence on Business Strategy and SERVQUAL: Nielsen & Mack Approach. *Golden Ratio of Marketing and Applied Psychology of Business*, 1(2), 81–92.
- [24] Higgins, J. M. (1996). Innovate or evaporate: creative techniques for strategists. *Long Range Planning*, 29(3), 370–380.
- [25] Ilyas, G. B., & Mustafa, H. (2022). Price, Promotion, and Supporting Facilities on Customer Satisfaction. *Golden Ratio of Marketing and Applied Psychology of Business*, 2(1), 1–11.
- [26] Jin, X., Lei, G., & Yu, J. (2016). Government governance, executive networks and enterprise R&D Expenditure. *China Journal of Accounting Research*, 9(1), 59–81. <https://doi.org/https://doi.org/10.1016/j.cjar.2015.09.001>

- [27] Joseph F. Hair, Jr., G.Tomas M. Hult, Christian M. Ringle, M. S. Rstedt. (2013). A Primer on Partial Least Squares Structural Equation Modeling. In Long Range Planning (Vol. 46, Issues 1–2). <https://doi.org/10.1016/j.lrp.2013.01.002>
- [28] Kim, K.-H., & Suh, S. H. (1993). Speculation and price bubbles in the Korean and Japanese real estate markets. *The Journal of Real Estate Finance and Economics*, 6(1), 73–87.
- [29] Laitinen, E. K., Lämsiluoto, A., & Salonen, S. (2016). Interactive budgeting, product innovation, and firm performance: empirical evidence from Finnish firms. *Journal of Management Control*, 27(4), 293–322.
- [30] Lewis, D., Springer, T. M., & Anderson, R. I. (2003). The cost efficiency of real estate investment trusts: An analysis with a Bayesian stochastic frontier model. *The Journal of Real Estate Finance and Economics*, 26(1), 65–80.
- [31] Marjanova, T. J., Sofijanov, E., Davcev, L., & Temjanovski, R. (2015). Entrepreneurial Competition Orientation and Profitability: The Case of a Developing Economy. *Procedia - Social and Behavioral Sciences*, 207, 652–661. <https://doi.org/10.1016/j.sbspro.2015.10.135>
- [32] Mitchell-Ketzel, S. (2003). Optimising business performance through innovative workplace strategies. *Journal of Facilities Management*, 2(3), 258–275. <https://doi.org/10.1108/14725960410808249>
- [33] Moradi, M., Salehi, M., & Mozan, S. (2022). The effect of different types of intelligence on organizational performance. *The TQM Journal*, ahead-of-p(ahead-of-print). <https://doi.org/10.1108/TQM-03-2021-0071>
- [34] Murali, S., Pugazhendhi, S., & Muralidharan, C. (2016). Modelling and Investigating the relationship of after sales service quality with customer satisfaction, retention and loyalty – A case study of home appliances business. *Journal of Retailing and Consumer Services*, 30, 67–83. <https://doi.org/https://doi.org/10.1016/j.jretconser.2016.01.001>
- [35] Murtini, S. (2021). Normative Consideration on Purchase Decision. *Golden Ratio of Mapping Idea and Literature Format*, 1(2), 108–133.
- [36] Naala, M., Nordin, N., & Omar, W. (2017). Innovation capability and firm performance relationship: A study of pls-structural equation modeling (Pls-Sem). *International Journal of Organization & Business Excellence*, 2(1), 39–50.
- [37] Narver, J. C., & Slater, S. F. (1990). The Effect of a Market Orientation on Business Profitability. *Journal of Marketing*, 54(4), 20–35. <https://doi.org/10.2307/1251757>
- [38] Nguyen, T. L. H., & Nagase, K. (2021). Patient satisfaction and loyalty to the healthcare organization. *International Journal of Pharmaceutical and Healthcare Marketing*, 15(4), 496–515. <https://doi.org/10.1108/IJPHM-02-2020-0011>
- [39] Nurhilalia, Rahman Kadir, A., Mahlia, M., Jusni, & Aditya, H. P. K. P. (2019). Determinant of market orientation on SME performance: RBV and SCP perspective. In *Journal of Distribution Science* (Vol. 17, Issue 9, pp. 35–45). <https://doi.org/10.15722/jds.17.09.201909.35>
- [40] Ogedengbe, P. S. (2007). Compulsory acquisition of oil exploration fields in Delta State, Nigeria. *Journal of Property Investment & Finance*, 25(1), 62–76. <https://doi.org/10.1108/14635780710720171>
- [41] Palvia, A., Vähämaa, E., & Vähämaa, S. (2020). Female leadership and bank risk-taking: Evidence from the effects of real estate shocks on bank lending performance and default risk. *Journal of Business Research*, 117, 897–909. <https://doi.org/https://doi.org/10.1016/j.jbusres.2020.04.057>
- [42] Prajogo, D. I., & Sohal, A. S. (2003). The relationship between TQM practices, quality performance, and innovation performance: An empirical examination. *International Journal of Quality & Reliability Management*.
- [43] Ramírez-Solis, E. R., Llonch-Andreu, J., & Malpica-Romero, A. D. (2022). How beneficial are relational capital and technology orientation for innovation? Evidence from Mexican SMEs. *International Journal of Innovation Studies*, 6(1), 1–10. <https://doi.org/https://doi.org/10.1016/j.ijis.2022.02.001>
- [44] Reshetko, N. I., Vakulenko, S. P., Kurenkov, P. V., Alexandrova, J., Merkulina, I., Kuzina, E. L., Vasilenko, M. A., Chebotareva, E. A., Solop, I. A., & Gašparík, J. (2021). Analysis of

- marketing efficiency on the example of Faraday future (Manufacturer of electronic machines). Transportation Research Procedia, 55, 348–355. <https://doi.org/https://doi.org/10.1016/j.trpro.2021.07.091>
- [45] Scott, T. W., & Tiessen, P. (1999). Performance measurement and managerial teams. Accounting, Organizations and Society, 24(3), 263–285.
- [46] Yunus, N., Hansz, J. A., & Kennedy, P. J. (2012). Dynamic interactions between private and public real estate markets: Some international evidence. The Journal of Real Estate Finance and Economics, 45(4), 1021–1040.
- [47] Zhou, K. Z., Brown, J. R., & Dev, C. S. (2009). Market orientation, competitive advantage, and performance: A demand-based perspective. Journal of Business Research, 62(11), 1063–1070. <https://doi.org/10.1016/j.jbusres.2008.10.001>