RELATIONSHIP BETWEEN RISK FACTORS AND RISK INFORMATION SHARING AT SME'S IN BANDUNG

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Abstract

SMEs are beginning to realize that today's consumers want the company to provide cheap, quality products, and quick response. To be able to meet the wishes of the company's consumers must be able to make improvements. In the process of improvement, SMEs faces some interference from internal and external company. Disorders from internal companies can be a disruption of the manufacturing process, financial disturbances, and disruptions caused by inappropriate products. External distractions may arise from the environment, demand, supply, information and logistics. To survive, SMEs must establish the right strategy to keep their business running and growing. SMEs can be more developed with risk sharing strategies. This study measures the relationship between risk factors and risk sharing information. This research uses quantitative method with PLS software for data processing. Population in this research is all existing SMEs in Bandung city of West Java.

Keywords : SME, Risk Factors, Risk Information Sharing, PLS

1. Introduction

Facing the era of free market in Southeast Asia, the business world in Indonesia must take strategic steps in order to face competition with other ASEAN countries, including the sector of Cooperatives and Micro Small and Medium Enterprises (SMEs) (Arisandy, 2016).

The increasing number of SMEs and the increasing competition makes MSMEs have to think about ways to maintain business continuity. SMEs face risks in running their business, the risks faced can make SMEs cannot survive. A strategy is needed to enable SMEs to cope with emerging risks or to anticipate risks. Supply chain risk according to Tang and Musa (2011) is an incident that the rate of occurrence is small but may appear suddenly and bring negative impact.

The risks that appear in SMEs in the city of Bandung are inventory risk, risk demands, supply risk, logistic risk, manufacturing risk and production risk (Widiyanesti, Bahari, Pasha and Istiqamah, 2017).

In business activities that have a high degree of risk of uncertainty, companies must manage their supply chain effectively in order to improve efficiency. Problems encountered in business processes such as loss in supply or quality management issues, make it important to risk management in the supply chain. It aims to reduce the negative impact of external disturbances especially on the scope of small and medium-sized micro enterprises in an effort to improve supply chain performance on their business (Thun and Hoenig, 2009). Tampubolon, Bahaudin, and Ferdinant (2013) said that in supply chain management, risks can arise in any situation. This creates uncertainty that comes from uncertain suppliers. While from the internal side, risks can arise which lead to decreased productivity. Collaboration between SMEs with suppliers and consumers is needed (Khan, Hussein and Saber, 2016). Collaboration can make companies more able to survive the risks. One of the collaborative strategies that can be done is with risk sharing strategies (Khan, Hussein and Saber, 2016). In this research will discuss about the relationship between risk factors with risk information sharing.

Discussion of what is risk factor, risk information sharing and hypothesis research will be discussed in section two. The third section will discuss the methodology used in this paper. The results of this paper will be discussed in section four. The fifth section will be reviewed on the results of section four, and section six is a conclusion of the paper and is also discussed about future research.

2. Literature Review

2.1 Risk Information Sharing

Risk sharing is not a new thing. Some researchers have done research on this area. As research has been done by Wu and Edwin Cheng (2008) conducted research on risk information sharing at Wal-mart. In this research states that information sharing on Wal-Mart is to outsource inventory planning to suppliers. In his research stated that supplier is responsible for information sharing through monitoring inventory levels, planning replenishment and suggestion new ideas to improve throughtout. Li and Zhang (2008) stated that risk sharing information can improve coordination in the supply chain. Risk information sharing in retail companies can be done by sharing demand information between retailers with manufacturing.

Risk information sharing can improve the shielding between supply chain actors (Ha et al, 2008). The flow of information from all supply chain elements is important in the decision making process. Information sharing is an important element to make a decision for a better supply chain (Tang and Musa, 2011). Risk information sharing is a responsive supply chain strategy. Risk sharing will improve the company's ability to coordinate production planning (Roh et al, 2014). Multi-level information sharing with partnering firms through diverse communication channels is common, given the complexity of supply chain management (Yuan et al., 2012). Information sharing occurs outside the organization in the supply chain. Effective external information sharing between major partnering firms such as major suppliers is essential for supply chain implementation (Yuan et al., 2012). Organizations need information and the ability to share that information to develop contingency plans, manage the planning process, and control daily operations (Kaplan, 1991; Skipper and Hanna, 2009).

In this research will be discussed about risk information sharing as an activity that can reduce the influence of risk in the company. As the research conducted by Li et al, 2015 which states that Information sharing activities can improve the coordination between the processes of different supply chain members, leading to improved supply chain integration, delivery accuracy, time-to-market, customer satisfaction, and partnership quality . Without using risk information sharing the member of supply chain cannot achieve effective and efficient response to potential disruption of the risks that arise (Skipper and Hanna, 2009).

2.2 Risk Factors

Many of the risks faced by the company, the risks that arise in the company can cause failure in one of the supply chain.so that the overall performance of the supply chain can not perform its function properly (Tampubolon, 2013). Some researchers discuss the risks that arise in the company. Chopra and Meindl (2013) divide risk categories into Disruptions risk, Delay risk, System risk, Forecast risk, Intellectual property, Procurement risk, Receivable risk, Inventory risk, and Capacity risk.

However Jüttner (2005) distinguishes supply chain risk from external to internal. External consists of social environment, nature, and politics. Internal risk sources include demand and supply. The source of environmental risks comprises any external uncertainties arising from supply chains, such as political disruptions (e.g fuel crisis). Natural risks such as fires, earthquakes, and social environments such as terrorist attacks. For the source of demand and supply risk are internal sources for supply chain risk. Puuniyamoorthy, et al. (2013) summarizes the various risk sources into six risks: supply side risk, manufacturing side risk, demand side risk, logistic side risk, information side risk and environment side risk.

Simchi-Levi et al. (2009) argue that there are various types of risks faced by global companies. Starting from unpredictable risks to predictable risks, as well as uncontrollable risks to controllable risks. Type of risk according to Simchi-Levi et al. (2009) are natural disaster risk, geopolitical risk, epidemics, terrorist attacks risk, volatile fuel price risk, currency fluctuation risk, port delays risk, market changes risk, risk suppliers, risk forecasts accuracy, and execution risk risk. Giannakis and Papadopulos (2016) summarize the supply chain risk associated with business sustainability into two factors, namely endogenous and exogenous as seen in table 1.

Table 1. Risiko Rantai Pasok Menurut Giannakis dan Papadopulas

Endogen	**Eksogen**
Environmental	
Environmental accidents	*Natural disasters*
Pollution	*Water scarcity*
Non – compliance with sustainability laws	*Heatwaves, droughts*
Emission of greenhouse gases, ozone depletion	
Energy consumption	
Product waste	
Excessive or unnecessary packaging	
Social	
Excessive working time; work-life imbalance	*Pandemic*
Unfair wages	*Social instability*
Child labor/forced labor	*Demographic challenges/ ageing populations*
Discrimination race, sex, religion, disability, age, political view	
Healthy and safe working environment	
Exploitative hiring policies	
Unethical treatment of animals	
Financial/economic	
Bribery	*Boycotts*
False claims/dishonesty	*Litigations*
Price fixing accusations	*Energy prices volatility*
Antitrust claims	*Financial crises*
Patent infringements	

Endogen	Eksogen
Tax evasion	

2.3 Hypothesys

Risks facing the company can affect the strategy implemented by the company. One of the responsive strategies implemented by the company is risk sharing information. In accordance with research conducted by widiyanesti et al (2017) risk faced by SME in Bandung is inventory risk, demand risk, supply risk, logistic risk, manufacturing risk and production risk. In this paper will be discussed about the relationship of risk factor to SMEs to the risk information sharing company.

Inventory is important to the company. If the inventory is excessive in the company then the cost becomes high. Information sharing can improve firm operational such as inventory allocation and inventory cost saving (Li And Zhang, 2015). This study proposes the hypothesis are as follows:

H_1 Inventory risk have significantly positive influence on risk information sharing.

Demand uncertainty can be caused by several things such as consumer expectations, complex supply chain, and a variety of products. Uncertainty demand can be handled by sharing information between companies with all the chains in the supply chain (Sheffi and Rice, 2005). This study proposes the hypothesis are as follows:

H_2 Demand risk have significantly positive influence on risk information sharing.

To create a product in accordance with the wishes of consumers, companies should be able to collaborate with suppliers. A good way to collaborate with suppliers is to share information sharing practices (Roh et al, 2014). This study proposes the hypothesis are as follows:

H_3 Supply risk have significantly positive influence on risk information sharing.

Logistics risk can broadly be categorized as the potential disturbances to the flow of goods, information, and money (Ellegaard, 2008). The consequences of poor logistic management are transport network management and delays in delivery (Punniyamoorthy, Thamaraiselvan, and Manikandan, 2011). Obstacles like transport network management can be anticipated with risk information sharing strategy. This study proposes the hypotheses are as follows

H_4 Logistic risk have significantly positive influence on risk information sharing.

There are many risks that arise in the company, one of the risks that arise in the company is manufacturing risk. Manufacturing risks can occur due to the use of technology within the company and the interaction between the company and other companies. Corporate interactions can be information sharing between companies and suppliers and customers (Caldwell et al, 2013). This study proposes the hypotheses are as follows:

H_5 Manufacturing risk have significantly positive influence on risk information sharing.

Reject products will not be accepted by consumers. The company must be able to ensure the product made in accordance with the wishes of consumers. Consumers' desire can be achieved with risk sharing strategies. This study proposes the hypotheses are as follows:

H_6 Product risk have significantly positive influence on risk information sharing.

3. Methodology

This study will be carried out using the cross-sectional method. This method is used as data is gathered just once, over a period of weeks versus a longitudinal study where data is collected at two or more points in time in order to answer the research questions (Sekaran & Bougie, 2016). The unit of analysis is the level of aggregation of the data to be collected during the data analysis stage (Sekaran & Bougie, 2016). The unit of analysis in this study is the organization, which primarily refers to the small medium enterprise in Bandung. In this study, the samples were selected based on non-probability, stratified sampling method. It involved a process random selection of subjects from each stratum based on segregation or stratification (Sekaran & Bougie, 2016). This sampling method was used because the population was heterogeneous and comprised of mixture of more than one element. The research objective and the scope of study play an important part in defining the target population (Sekaran & Bougie, 2016). The population frame for the study consists of Small Medium Enterprise in Bandung. It have been identified around 3595 firms as sample frame in this study. People who will do the questionnaire is the owner of the business of small medium enterprise in Bandung. Those positions are filling out the questionnaires, as they understand the risk information sharing conditions and risk factors retain the company. The questionnaire will be distributed to the small medium enterprise by using visiting the responden.

The samples of this study were chosen based on the department of industry and commerce directories. By using slovin formula then sample size of this research is as many as 97.29 and the number of samples collected as many as 105 samples.

Questionnaires are considered an efficient method to collect data from the respondents to measure the variables of interest. The 5-point Likert scale was used in this study. The reason for applying the five levels was because five point scale is just as good as any, and that an increase from five to seven or nine point on rating scale does not improve the reliability of rating (Sekaran and Bougi, 2016). In the study, 5-point Likert scale from Strongly Disagree (1) to Strongly Agree (5) was used to measure the extent of the risk factor and supply chain risk management relate practices within firm resilience. According to Sekaran and Bougie (2016), questionnaire is usually defined as a reformulated written set of questions to record the respondents' answer, within rather close defined alternatives. The questionnaire contained four sections: (A) company profile and respondent profile; (B) assessment of risk factors and risk information sharing.

To do the analysis, in this research, the first few steps do Goodness of Data with Validity and Reliability test. The second is to analyze the goodness of fit measure by using standardized root mean square residual (SRMR) and normed fit index (NFI). For hypothesis testing is done by using t test.

4. Result

4.1 Goodness of Data

A. Validity Data

A.1 Discriminant Validity

A new standard approach of PLS will also be used to determine the discriminant validity of the measures by using the heterotrait-monotrait ratio of correlations (HTMT) as developed by Henseler et al (2015). When using HTMT as a criterion, HTMT must grater than $HTMT_{85}$ value of 0,85. The results of this study show the value of HTMT grater than value of 0.85. So with these results can be expressed data obtained valid by testing discriminant validity. For the HTMT result can be seen in table 2.

Table. 2 Result for HTMT

	Demand Risk	Inventory Risk	Logistic Risk	Manufacturing Risk	Product Risk	Risk Information Sharing	Supply Risk
Demand Risk							
Inventory Risk	0.076						
Logistic Risk	0.079	0.043					
Manufacturing Risk	0.049	0.091	0.097				
Product Risk	0.293	0.035	0.101	0.173			
Risk Information Sharing	0.157	0.295	0.054	0.210	0.197		
Supply Risk	0.088	0.104	0.096	0.060	0.192	0.114	

A.2 Construct Validity

For measure construct validity we used predictive power (R^2) and predictive relevance (Q^2). The rule of thumb for predictive relevance must be value larger than 0, it is indicate that exogenous construct have predictive relevance over endogenous construct (Hair et al, 2014). The value of R^2 presents the amount of variance in the construct that is explained by model. The rule of thumb of R^2 the values as substantial (0,26), moderate (0,13) and weak (0,02) (Hair et al, 2014). In this study the value of predictive relevance of 0.131 and predictive value of 0.226 which entered into the substantial category. From both categories can be expressed data in this study is valid seen from construct validity. For predictive power can be seen in table 3 and predictive relevance results can be seen in table 4.

Table 3. Result for predictive power

	R Square	R Square Adjusted
Risk Information Sharing	0.226	0.179

Table 4. Result for predictive relevance

	SSO	SSE	Q^2 (=1-SSE/SSO)
Demand Risk	420.000	420.000	
Inventory Risk	420.000	420.000	
Logistic Risk	420.000	420.000	
Manufacturing Risk	525.000	525.000	
Product Risk	420.000	420.000	
Risk Information Sharing	735.000	638.830	0.131
Supply Risk	420.000	420.000	

A.3 Convergent Validity

Sekaran and Bougie (2016) explained that the convergent validity can be established when there is a high degree of correlation between two different source responding to the same measure Hair et al 2014 stated rule of thumb for convergent validity is loadings should be 0,5 or higher, if the value of an item is below 0,5 it should be dropped. For this study, four measures of convergent validity will be assessed by checking the values of average variance extracted (AVE). In this paper all AVE values above 0.5, meaning that the data in this paper is valid if seen from convergent validity. Results from AVE can be seen in table 5.

Table 5. Result for AVE

	Average Variance Extracted (AVE)
Demand Risk	0.854
Inventory Risk	0.966
Logistic Risk	0.778
Manufacturing Risk	0.979
Product Risk	0.983
Risk Information Sharing	0.747
Supply Risk	0.741

B. Reliability Data

Reliability refers to an assessment of the degree of consistency among measurements of a variable. Measurement of internal consistency reliability used composite reliability. Rule of thumb for composite reliability should be higher than 0,70. For the indicator reliability measured by outer loading should be higher than 0,70 (Hair, 2017). In this paper the value of outer loadings and composite reliability above 0.70 means reliable data. For the results can be seen in table 6.

Table 6. Result for outer loadings and composite reliability

Variable		Outer Loadings	Composite Reliability
Demand Risk	DR1	0.928	0.959
	DR2	0.887	
	DR3	0.928	
	DR4	0.954	
Inventory Risk	IR1	0.979	0.991
	IR2	0.988	
	IR3	0.974	
	IR4	0.990	
Logistic Risk	LR1	0.864	0.933
	LR2	0.860	
	LR3	0.868	
	LR4	0.934	
Manufacturing Risk	MR1	0.988	0.996
	MR2	0.994	
	MR3	0.990	

Variable		Outer Loadings	Composite Reliability
	MR4	0.987	
	MR5	0.988	
Product Risk	PR1	0.990	0.996
	PR2	0.986	
	PR3	0.995	
	PR4	0.995	
Risk Information Sharing	RIS1	0.798	0.954
	RIS2	0.897	
	RIS3	0.911	
	RIS4	0.837	
	RIS5	0.942	
	RIS6	0.831	
	RIS7	0.826	
Supply Risk	SR1	0.942	0.919
	SR2	0.832	
	SR3	0.848	
	SR4	0.816	

4.2 Analysis of Goodness of Fit Measure

Analysis of goodness of fit mesure dapat dilihat dari nilai SRMR dan NFI. To measured model fit it used SRMR (Henseler et al, 2014). The rule of thumb for SRMR is a value less than 0,10 or of 0,08 are considered a good fit (henseler et al, 2014). The rule of thumb for Normed Fit Index (NFI) in values between 0 and 1, the closer NFI to 1, te better the fit (Ramayah, 2016). SRMR value in this paper amounted to 0.063 NFI value in this study close to lift 1 that is equal to 0.819 which means fit model in good condition. For the results of SRMR and NFI can be seen in table 7.

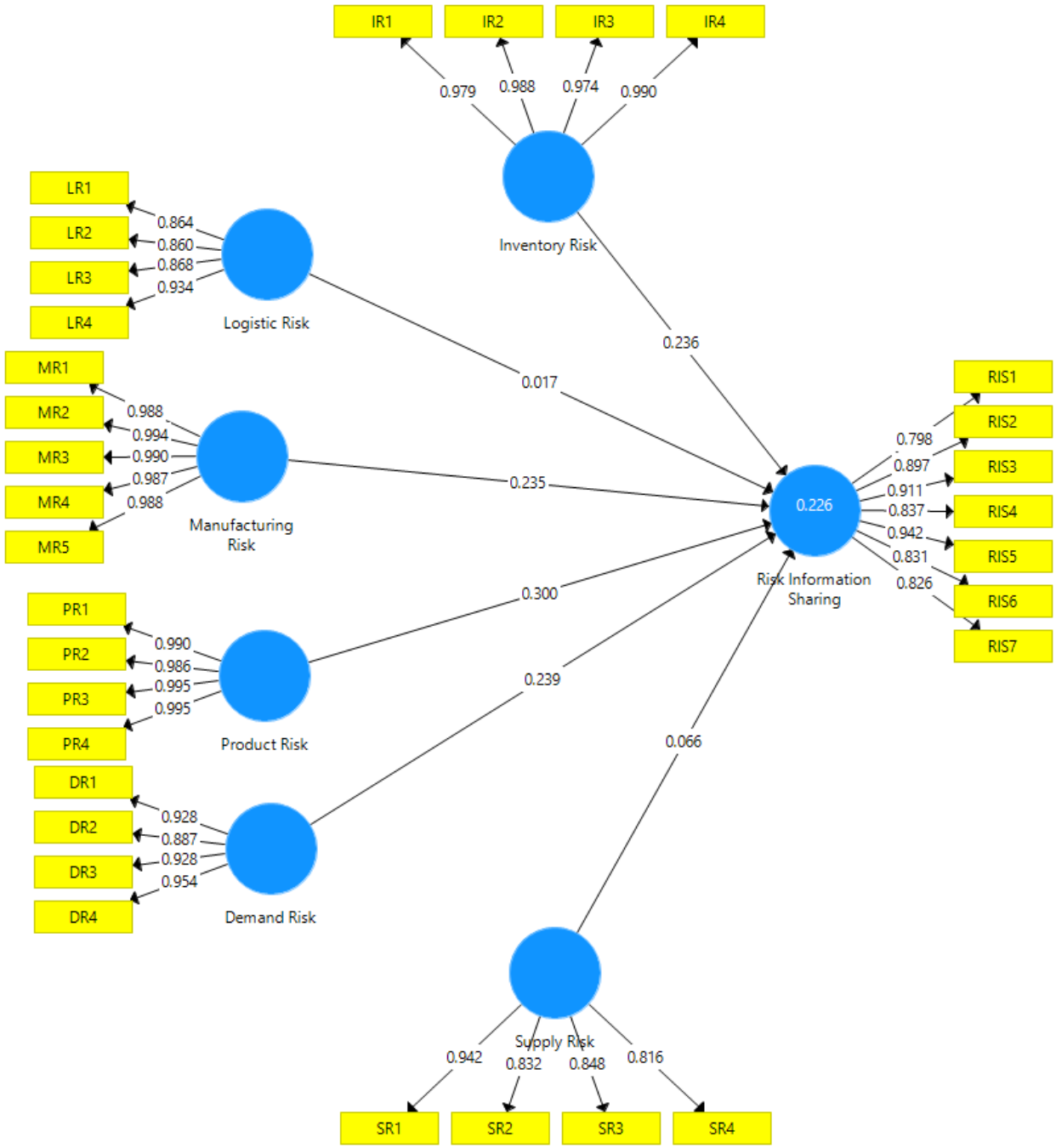
Table 7. Result for SRMR and NFI

	Saturated Model	Estimated Model
SRMR	0.063	0.063
NFI	0.819	0.819

4.3 Partial Least Square Modelling

PLS is increasing in acceptance and in some disciplines represent almost 50% of the statistical tools applied in empirical research (Hair et al. 2013). Gil-Garcia (2008) mentioned that PLS develops loadings between reflective constructs and their indicators, standardize regression coefficients between constructs, weight between formative constructs and their indicators, as well as coefficients of multiple determinations (R^2) for dependent variable. According to Sang, Lee and Lee (2010) study had chosen PLS as the data analysis technique due to PLS involves minimal demands in terms of sample size, it is more appropriate for theory development, instead of theory testing. In this paper we will discuss the relationship between risk factor and risk information sharing. The model of this paper can be seen in figure 1.

Figure 1. The model for relationship risk fctors and risk information sharing



4.4 Hypothesis Testing

Hypothesis testing dalam PLS dilakukan dengan cara bootsrapping. Bootsrap is the re-sampling method. It present a nonparametric approach for estimating the precision of the PLS estimates (Chin, 2010). The results of the PLS bootsrap provide weights and loadings in the measurement models as well as mean values and standard errors for inner model path coefficients. For the hypothesis testing can be employed to perform t-test so that determine the significance of the path model relationship and the significant t-values at 1,645 with $p < 0,05$. Result for the bootstrap can be seen in figure 2 and for hypothesis testing can be seen in table 8.

Figure 2. Bootstraping Result

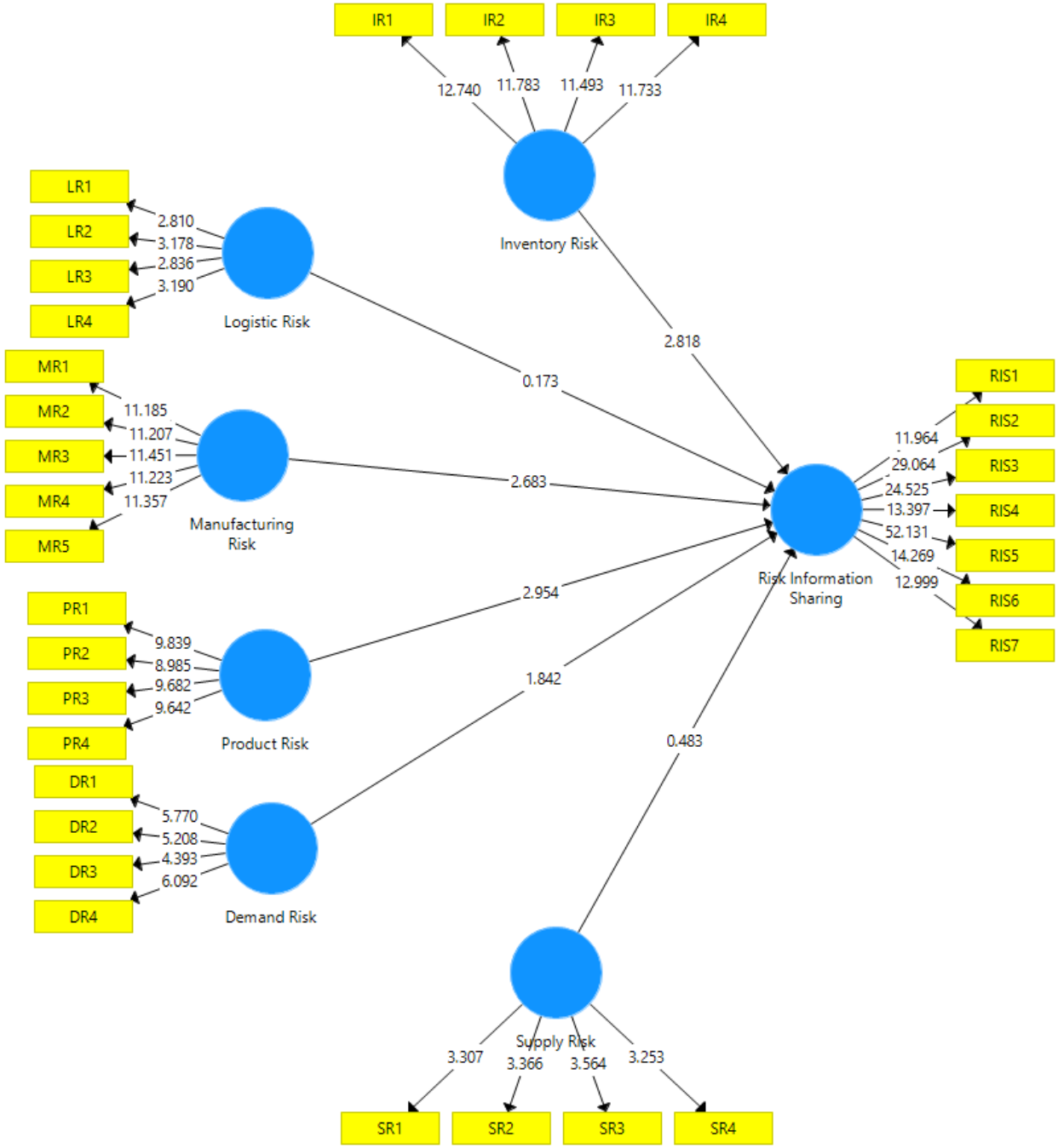


Table 8. Hypothesis testing

	Standard Beta	t-Test	P Values	Decision
Demand Risk -> Risk Information Sharing	0.239	1.842	0.033	Accepted
Inventory Risk -> Risk Information Sharing	0.236	2.818	0.003	Accepted
Logistic Risk -> Risk Information Sharing	0.017	0.173	0.431	Rejected
Manufacturing Risk -> Risk Information Sharing	0.235	2.683	0.004	Accepted
Product Risk -> Risk Information Sharing	0.300	2.954	0.002	Accepted
Supply Risk -> Risk Information Sharing	0.066	0.483	0.315	Rejected

Hypothesis H_1 predict that inventory risk has a significantly positive influence on risk information sharing. The result of H_1 was illustrated in the path from inventory risk to risk information sharing. The path coefficient between inventory risk and risk information sharing was positive significant at $p<0,05$ (β = 0,236 and t value = 2,818). Therefore, H_1 was supported. Hypothesis H_2 predict that demand risk has a significantly positive influence on risk information sharing. The result of H_2 was illustrated in the path from demand risk to risk information sharing. The path coefficient between demand risk and risk information sharing was positive significant at $p<0,05$ (β = 0,239 and t value = 1,842). Therefore, H_2 was supported. H_3 postulates that supply risk has a positive effect on risk information sharing. The result of H_3 was illustrated in the path from supply risk to risk information sharing. The path coefficient between supply risk and risk information sharing was not positive significant at $p>0,05$ (β = 0,066 and t value = 0,483). Therefore, H_3 was not supported. The result of H_4 was illustrated in the path from logistic risk to risk information sharing. The path coefficient between logistic risk and risk information sharing was not positive significant at $p>0,05$ (β = 0,017 and t value = 0,173). Therefore, H_4 was not supported.

Hypothesis H_5 predict that manufacturing risk has a significantly positive influence on risk information sharing. The result of H_5 was illustrated in the path from manufacturing risk to risk information sharing. The path coefficient between manufacturing risk and risk information sharing was positive significant at $p<0,05$ (β = 0,235 and t value = 2,683). Therefore, H_5 was supported. Hypothesis H_6 predict that product risk has a significantly positive influence on risk information sharing. The result of H_6 was illustrated in the path from product risk to risk information sharing. The path coefficient between product risk and risk information sharing was positive significant at $p<0,05$ (β = 0,300 and t value = 2,954). Therefore, H_5 was supported.

5. Discussion

From the results of calculations in this study, obtained some accelerate hypothesis testing. For the relationship of inventory risk and risk sharing information accepted results, this result states that the inventory risk that appears on MSME will affect the risk information sharing. This is in line with research conducted by LI and Zhang (2015) which states that inventory is important to the company. If the inventory is excessive in the company then the cost becomes high. With the risk on inventory will affect the risk information sharing company.

Uncertainty demand can be handled by sharing information between companies with all the chains in the supply chain (Seffie and Rice, 2005). This is in line with the results of this study, where demand risk has a significant positive effect on risk sharing information.

In this study supply risk has no significant positive effect on risk information sharing. Not in line with research conducted by Roh et al (2014). This can happen because in SMEs in Bandung, so many suppliers, so that MSMEs still have a strong influence to determine the selection of suppliers. So the risk information sharing strategy is still not done on SMEs in the city of Bandung.

Logistic risk has no effect on risk sharing information. This is in contrast to the research conducted by Punniyamoorthy et al (2011) which mapped out the consequences of poor logistic management is transport network management and delays in delivery. Not influential logistic risk due to delivery to product SMEs in the city of Bandung is not managed solely by SMEs, but using third parties.

In this research, manufacturing risk has an influence on risk sharing information. This is in line with research conducted by Caldwell et al (2013) stating that manufacturing risk can occur due to the use of technology in the company and interaction between companies and other companies. Corporate interactions can be information sharing between companies and suppliers and customers (Caldwell et al, 2013).

The results of this study indicate that product risk has an influence on risk sharing information. Reject products will not be accepted by consumers. The company must be able to ensure the product made in accordance with the wishes of consumers. Consumers desire can be achieved with risk sharing information strategy.

6. Conclusion

From the results of this study can be concluded four risks affect the risk of information sharing. Risks that affect the risk information sharing is the inventory risk, demand risk, manufacturing risk and product risk. While the risk that does not affect the risk of information sharing is supply risk and logistic risk.

It can be concluded for MSME owners that their company can survive the risks that emerge can use risk information sharing strategy. Risks that must be considered by the owners of SMEs are inventory risk, demand risk, manufacturing risk and product risk. For the next research can be done empirical measurement on the relationship between risk factor, risk information sharing with the impact on sustainability company. Can be measured relationship between risk factor and risk information sharing on other types of companies.

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Biographies

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Azlan Amran started his career as a lecturer at the School of Management, Universiti Sains Malaysia in 2006. He is now a Professor at the Graduate School of Business in the same University. Prior to joining USM, he worked as an accountant for several years. He has published a significant number of articles in the area of CSR in both local and international journals. He is currently supervising PhD, MBA, and Masters candidates in CSR. At present, he holds the position of Dean at the Graduate School of Business. In terms of practical experience, he has been involved in several training and consultancy projects in Accounting-related issues and Corporate Social Reporting. He is currently holding several grants to support his research on CSR-related issues. He is also a member of the editorial board for several international journals. At the national level, he is a Technical Committee member for ISO 26000.