

The role of trust as a mediator on the effect of productivity in the fishing-industry supply chain performance in Riau, Indonesia

¹Eni Yulinda, ²Kamisah Supian, ³Mazni Saad

¹ Department of Fisheries Socioeconomics, Faculty of Fisheries and Marine, University of Riau, Pekanbaru, Indonesia; ² Faculty of Business, Selangor University, Shah Alam, Malaysia; ³ Department of Tourism, Kulliyah of Languages and Management, International Islamic University Malaysia, Muar, Johor, Malaysia. Corresponding author: E. Yulinda, eni.yulinda@lecturer.unri.ac.id

Abstract. This survey research was conducted from August to October 2020 in Rokan Hilir, one of the largest fishing industry centers in Riau Province, Indonesia. There are two research objectives, namely to analyze the influence of productivity on the fishing industry supply chain performance, and the role of trust as a mediator in the influence of productivity on the fishing industry supply chain performance in Rokan Hilir. 270 fishing companies were respondents, using the Slovin formula. The hypothesis was tested by the Structural Equation Modeling-Partial Least Square (SEM-PLS) method. The results show that all dimensions can reflect their respective latent variables (productivity, trust, and performance), so that they can be used as model estimators. Furthermore, the results of hypothesis testing show that productivity, both directly and through trust mediation, has a significant effect on the fisheries industry supply chain performance.

Key Words: fishing industry, rokan hilir riau, supply chain management, trust.

Introduction. Rokan Hilir Regency is the center of one of the most productive fishing industry areas in Riau Province, Indonesia, because this area is facing the Malacca Strait, which is rich in nutrients. The Malacca Strait is located at the meeting point of two currents belonging to the Indonesian Ocean and to the South China Sea. The movement of currents between the two oceans brings nutrients to the Malacca Strait. In the 1960s, this district was the second fish-producing area in the world after Norwegia (Pradini et al 2017). In 2018, fishing production in Rokan Hilir is 45800 tons per year (42.47% of the total fish production of Riau), with a value of 109620 USD (Ministry of Marine Affairs and Fisheries Republic of Indonesia 2019). The Rokan Hilir fishing industry involves 945 fishing companies, operates 2208 fishing boats, and employs 2035 fishermen (Dinas Perikanan dan Kelautan Rokan Hilir 2018). The data shows that fishing companies in Rokan Hilir are only small businesses, because they only have two to three crew members on average. Rokan Hilir fishermen sell their fish to the "tauke" (collectors, agents, and exporters). Tauke then sell their fish to the domestic (the other city in Riau, and North Sumatra Province) or export market (Malaysia), as illustrated in Figure 1. Fish export can be done because the two locations are close to each other, six hours away by sailing (Hendri et al 2018). The amount of fish supply from the fishermen to the tauke depends on the productivity level of the fishermen and the fishing season. Productivity is the ability to produce goods or services in a certain time unit (Talib et al 2011). Tiwari et al (2018) state that productivity is a concept that explains the relationship between production (the number of goods and services produced) and resources (amount of labor, capital, and so on).

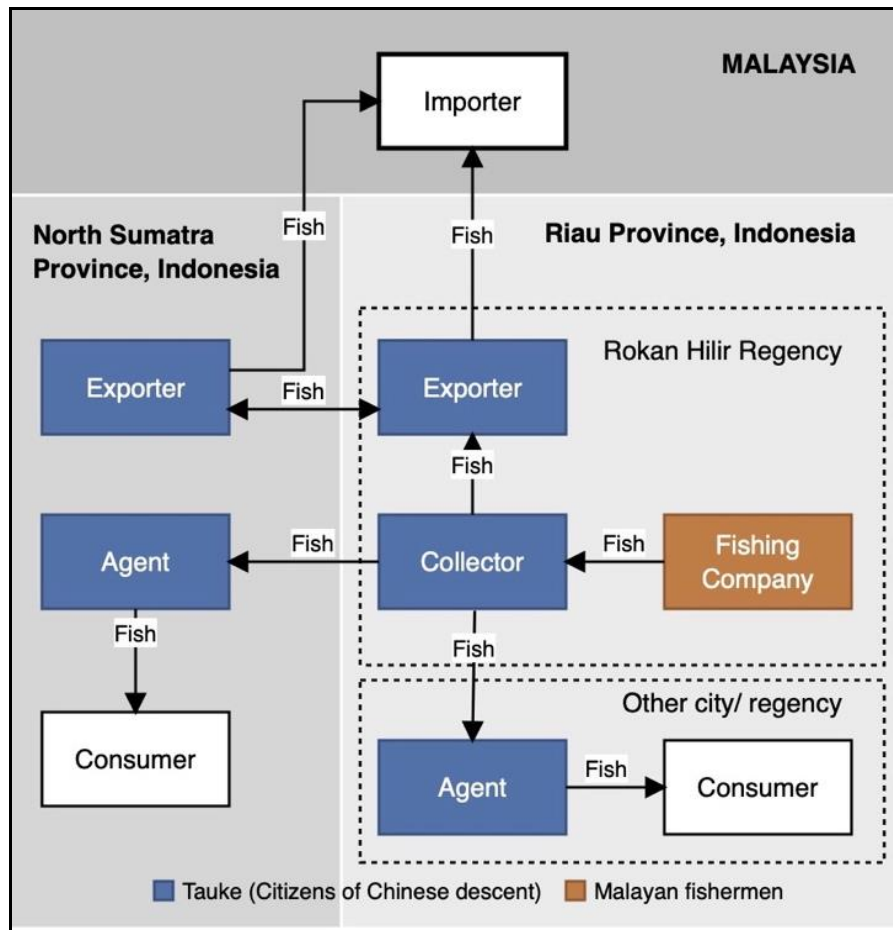


Figure 1. The tauke-fishermen relationship pattern in Rokan Hilir (Hendri et al 2018).

Four factors determine fishing companies/fishermen productivity, namely business capital, fishing boat size, fishing gear size, and the number of fishermen/crew workers (Pratama et al 2016). Capital represents all costs required by fishermen for fishing operations. In Indonesia, capital is often an inhibiting factor for fishing activities because the fishermen have deficient access to banking (Masyhuri 2014). The fishing boat size determines the fishing boat's ability to reach the fishing area (Suryana et al 2013; Palembang et al 2013). Large fishing boats are more productive because they can reach farther fishing areas (Niam & Hasanudin 2017). Purwanto & Nugroho (2011) found that the trawl size affects fish production in Kendari, Indonesia. Other factors that affect fish production are the size of fishing gear and the number of crew (Rachman et al 2013; Azis et al 2017). Aji et al (2013) suggest that the size of fishing gear (net-type) affects fish production in Bulu, Indonesia. Meanwhile, research by Suryana et al (2013) concluded that the length of fishing gear (a type of purse seine) affects fish production.

Apart from fishermen productivity, fish production is also influenced by seasons. In Rokan Hilir, during the west monsoon around December-April, the weather is usually extreme, where the wind is blowing hard, and the sea waves can reach up to two meters high. As a result, half the fishermen do not catch fish, so fish production drops (Pradini et al 2017). Fishermen productivity and fishing season affect the supply of fish to the tauke, which in turn will also affect the supply chain of the fishing industry in Rokan Hilir District. According to Mentzer et al (2001), the supply chain is a network of interconnected and interdependent organizations that work together to improve the flow of goods from suppliers to users, the flow of money from users to suppliers, and the flow of information from suppliers to users and vice versa. Furthermore, Lee & Ritzman (2002) and Scholten & Fynes (2017) explain that the supply chain includes all activities

related to the goods flow, money flow, and information flow between entities involved in the supply chain.

To ensure the stability of the fish supply chain, the tauke tries to maintain good relations with the fishermen. According to El-Amady (2015), in the tauke-fisherman relationship, the tauke acts as a socio-economic institution, which can regulate the production, distribution, and consumption processes of the community. The tauke-fisherman relationship occurs because there is a sense of trust. Trust is the willingness to take risks (Hossain & Ouzrout 2012), and the expectation that buyers and sellers will act according to the agreed commitments (Wu & Pullman 2015). Trust is considered as the basis for a strategic partnership between sellers and buyers (Spekman 1988). Trust and commitment will foster a desire to expand relationships in the future and in long-term engagement (Abosag et al 2006). Trust can improve supply chain performance. A study conducted by Kwon & Suh (2004) revealed that a company's trust in its supply chain partners is closely related to both parties' investment and behavioral uncertainty. In addition, sharing information can reduce the level of behavioral uncertainty, which increases the level of trust, whereas conflict can disrupt trust.

The effect of trust on supply chain performance has often been studied. Tejpal et al (2013) found that the higher the trust level, the better the supply chain management performance. Liu et al (2013) also concluded that supply chain management, trust, and risk factors are important because the entities involved are interdependent. However, according to Osman & Ilham (2013), trust can also act as a mediator in the relationship between two variables. The results of the study revealed that trust partially mediates the relationship between customer satisfaction and customer loyalty in the rural tourism industry in Malaysia.

Based on these reasons, it is necessary to research the role of trust as a mediator in the influence of productivity on the fishing-industry supply chain performance in Rokan Hilir, Riau, Indonesia, as illustrated in Figure 2. The four hypotheses proposed in this study are:

H1₁: Productivity has a significant influence on the fishing-industry supply chain performance.

H1_a: Productivity through trust has a significant influence on the fishing-industry supply chain performance.

H2: Productivity has a significant influence on trust.

H3: Trust has a significant influence on the fishing-industry supply chain performance.

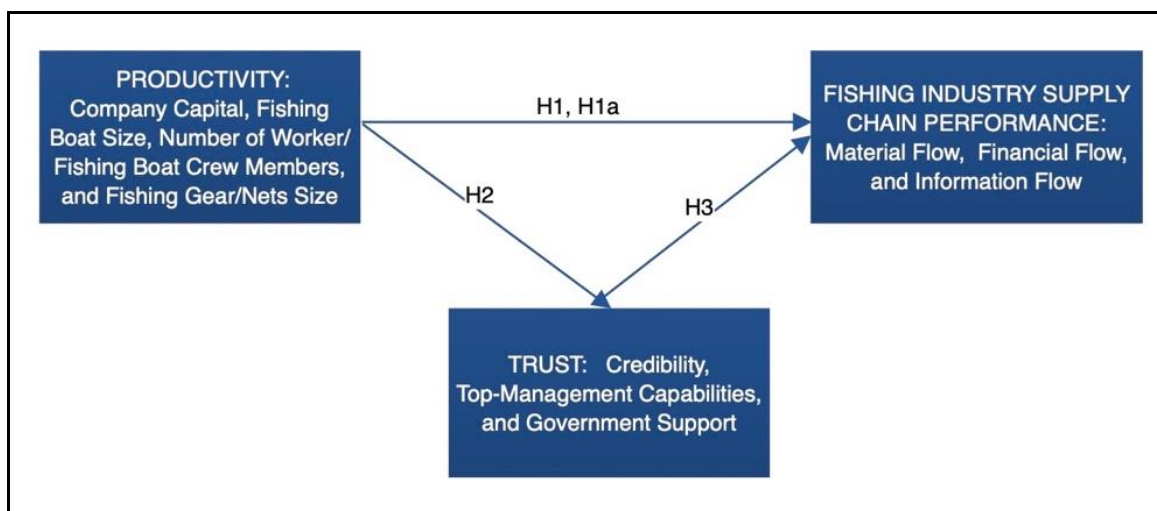


Figure 2. The relationship between productivity, trust, and fishing-industry supply chain in Rokan Hilir, Indonesia.

Material and Method

Description of the study sites. The survey was conducted from August to October 2020, in Rokan Hilir Regency, Riau Province. There are four sampling locations that were determined purposively, namely Panipahan, Bangko, Sinaboi, and Kubu Babussalam (Figure 3).

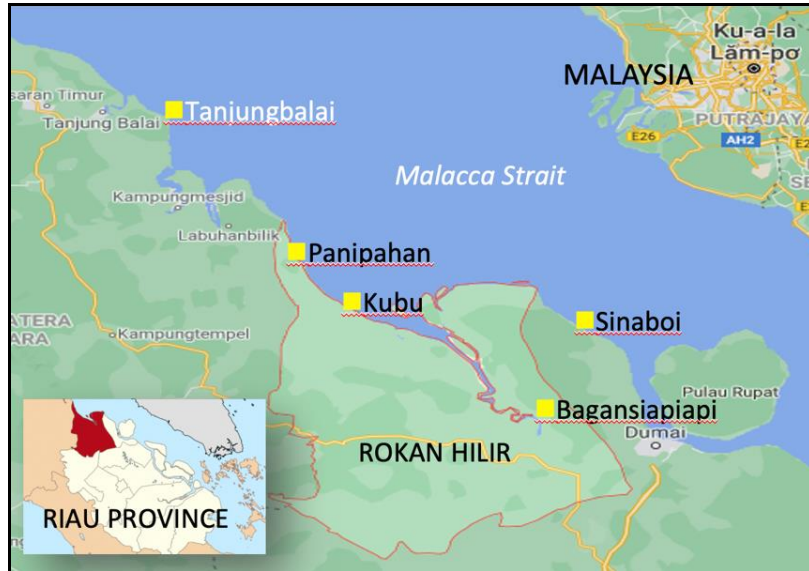


Figure 2. Rokan Hilir, Riau Province (BPS Rokan Hilir 2020).

Population and respondents. The population in this study was represented by 945 fishing companies in Rokan Hilir Regency, spread over four locations. Respondents were represented by 270 companies, and determined using the Slovin's formula. According to Hidayat (2017), the Slovin's formula is a mathematical system used to calculate the population number of certain unknown objects. The equation of Slovin's formula is the following:

$$n = \frac{N}{1 + Ne}$$

Where: n - sample size; N - population size; e - margin of error.

Respondents were selected by proportional purposive sampling, Panipahan with 98 respondents, Bangko with 86 respondents, Sinaboi with 74 respondents, and Kubu Babussalam with 12 respondents.

Data collection. The data was collected using a survey method, by systematically distributing questionnaires to respondents (Kahneman et al 2004; Ferdinand 2011; Sugiyono 2019). The types of data collected are primary data and secondary data. The primary data covers productivity, which consist of company capital (X1), fishing boat size (X2), the number of workers/crew members (X3), fishing gear size (X4); trust, which consist of credibility (X5), top-management capabilities (X6), government support (X7); financial flow (Y1), material flow (Y2), and information flow (Y3). Meanwhile, secondary data was obtained from books and other written documentation published by related institutions/agencies.

Statistical analysis. The data analysis was carried out in two stages, namely testing the instrument, and testing the hypothesis. The SPSS (Statistical Package for Social Science) software version 25.0, was used for instrument testing. The hypothesis was tested using the SEM-PLS (Structural Equation Modeling - Partial Least Square) method with the help of SmartPLS version 3.2.8 software. This method is effectively used to solve the

relationship (causality) between variables in a comprehensive, complex, and broad system. It can also be used to determine the dimensions that make up variables, test the validity and reliability of an instrument, ensure the accuracy of the model, and test the effect of a variable on other variables (Hair et al 2016). The SmartPLS application uses the bootstrap method (random multiplication), not needing a normality test, random sampling, nor a minimum number of samples (Syahrir et al 2020). PLS analysis is carried out in two stages, namely the evaluation of the measurement model (external model), and the structural model evaluation (inner model). The external model is used to obtain the validity and reliability of the research construct, while the inner model is used to answer the hypothesis. The evaluation of the inner model can be seen from the value of the coefficient of determination (R-Square or R^2), and the value of t-statistics. The value of R^2 shows how many percent of a variable can explain other variable. Variables that cannot be explained are explained by other variables not included in the research model (Sarstedt et al 2017). Hypothesis testing of the bootstrap procedure was used to obtain the t-statistic value for each path relationship. Furthermore, the t-statistic value was compared with the t-table value using a 95% confidence level ($\alpha=0.05$). If the t-statistic was higher than the t-table value, the hypothesis is accepted. The t test uses the two-way (two-tailed) method (Sarwono 2010).

Results and Discussion

Measurement model evaluation (outer model). The analysis results show that the loading factor value of all variable dimensions is higher than 0.6 (Figure 3). Therefore, all dimensions can reflect their respective latent variables significantly, and they can be used as model estimators. According to Ghozali & Latan (2015), individual reflective measures are high if the correlation value exceeds 0.6.

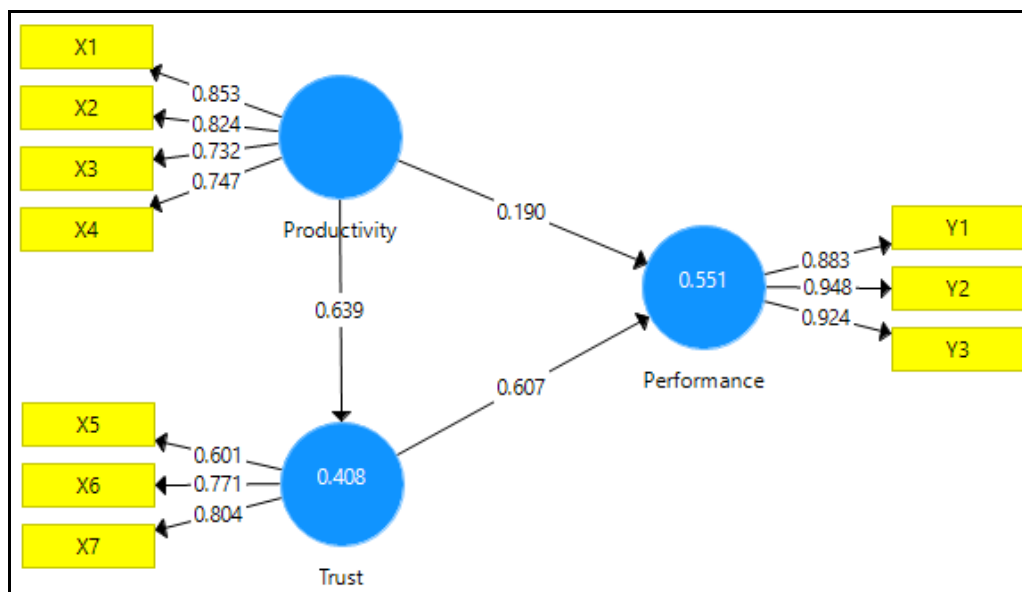


Figure 3. The results of the measurement model analysis.

Structural model evaluation (inner model). The results of the analysis showed that the R^2 value of the trust variable was 0.408, and the performance variable was 0.551. Thus, the trust variable can be described by variable productivity of 40.8%, while the rest is explained by other variables not included in this research model. Furthermore, the performance variable can be described by the productivity and trust variables, with a proportion of 55.1%, while the rest is explained by other variables not included in this research model. The results show that the t-statistic value for all path relationships was higher than the t-table value (1.96), and $p < 0.05$ (Table 1). The t-statistical value of the effect of productivity on performance was 3.284; the effect of productivity on trust was

12.615; the effect of trust on performance was 9.817; and the effect of productivity on performance through trust was 9.305. Thus, all variables are declared significant. This means that the fishing industry performance in Rokan Hilir is affected by productivity, either directly or indirectly (through mediating trust).

Table 1

The results of the t-test analysis

| | <i>Original sample (O)</i> | <i>Sample mean (M)</i> | <i>Standard deviation (STDEV)</i> | <i>T Statistics (O/STDEV)</i> | <i>P values</i> |
|------------------------------------|----------------------------|------------------------|-----------------------------------|---------------------------------|-----------------|
| Productivity → Performance | 0.190 | 0.189 | 0.058 | 3.284 | 0.001 |
| Productivity → Trust | 0.639 | 0.637 | 0.051 | 12.615 | 0.000 |
| Trust → Performance | 0.607 | 0.613 | 0.062 | 9.817 | 0.000 |
| Productivity → Trust → Performance | 0.387 | 0.395 | 0.042 | 9.305 | 0.000 |

The effect of productivity on the performance of the fishing industry supply chain in Rokan Hilir occurs because productivity is related to production factors. There are four dimensions that reflect production factors, namely company capital, fishing boat size, fishing gear size, and the number of workers. The analysis results show that the four production factors can reflect the productivity variables well. These results are in line with other studies. Puluhalawa et al (2016) concluded that company capital, fishing boat size, and the number of workers simultaneously had a significant effect on the fish production in Gorontalo, Indonesia. A greater company capital will bring a higher fish production; a bigger fishing boat will have a better ability to reach the fishing area; and a higher number of crew members will have a better ability to operate the fishing gear. Nelwan et al (2015) added that the size of the fishing gear affects the amount of fish production in Sinjai, Indonesia. Likewise, Purwanto & Nugroho (2011) concluded that fishing boat size has a significant effect on fish catch using trawlers in Kendari waters, Indonesia. Lestari et al (2017) found that the number of worker had a significant effect on fish catch in Cilacap, Central Java. Abdul Talib et al (2007) concluded that the number of workers, together with the cost of tie and ship type, has a significant effect on the fish catch in Negeri Sembilan.

The effect of trust on the fishing industry supply chain performance in Rokan Hilir can occur in two ways. Firstly, there is a patron-client relationship between fishing companies and tauke; secondly, there is a kinship between fellow tauke. This is following the opinion El-Amady (2014), who states that in the tauke-fisherman relationship, the tauke can help the production, distribution, and consumption processes of the community. Tauke buys all the fish, sells all the basic needs of fishermen in debt, lends money to fishermen, and ensures the continuity of household consumption of fishermen during the big wave season at sea. On the other hand, fishermen will fulfill their commitment, selling fish to the tauke, even though the price is below the normal market range. Meanwhile, the mutual trust that occurs between the tauke is based on the existence of ethnic relations and family ties. According to Hendri et al (2018), the fishing industry business relationship among tauke in Rokan Hilir, tauke in Rokan Hilir and tauke in other regencies/cities in Riau Province, and tauke in Riau and tauke in North Sumatra Province can occur because of ethnic relations. The tauke are generally Indonesian citizens of ethnic Chinese origin. Even among the fish tauke (collectors, exporters, and agents), some have family ties. The relationship between the fishermen and the tauke, as well as fellow tauke in Rokan Hilir, is based on mutual trust. The fishing industry's supply chain performance is also related to trust. According to Supian & Rashid (2018), good supply chain performance can occur if there is high trust and strong commitment among the entities involved. Trust is very important because supply chain relationships always involve a higher level of interdependence between competitors (Prahinski &

Benton 2004). The research conducted by Fauzi et al (2019) concluded that trust significantly affects commitment in the practice of cash "waqf" services offered even by some banks. "Waqf" in Islam is a treasure set aside to be granted to other people or social institutions with the aim of overcoming economic and social inequality.

Trust also plays a role as a mediator in the relationship between productivity and performance of the fishing industry supply chain in Rokan Hilir Regency. The mediation role of trust is only 40.8%, the rest being influenced by other mediators. Several studies reveal the trust role as a mediator in the relationship between supply chain performance variables. Song et al (2019) found that relationship-based trust proved to be the most significant in influencing decision making. Trust is an important element in enhancing collaboration and reducing conflict in the governance of the transboundary natural resource system network in Andrew's Great Lakes fisheries policy network. Yasir & Khan (2020) found that ethical leadership with employee trust can reduce the likelihood of deviant behavior at work in the Khyber Pakhtunkhwa public sector hospital, Pakistan. Ethical leadership is proven to help foster employee trust, suppressing the emergence of deviant behavior in the hospital.

Conclusions. This study concludes that productivity, either directly or through trust mediation, has a significant effect on the performance of the fishing industry supply chain in Rokan Hilir Regency, Indonesia. The mediation role of trust is only 40.8%. Therefore, further research is needed to explore other variables as mediators in the relationship between trust and the performance of the fishing industry supply chain in the regency.

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Conflict of Interest. The authors declare that there is no conflict of interest.

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Authors:

Eni Yulinda, Department of Fisheries Socioeconomics, Faculty of Fisheries and Marine, University of Riau, Kampus Bina Widya KM. 12.5 Simpangbaru, Tampan, 28293 Pekanbaru Riau, Indonesia, e-mail: eni.yulinda@lecturer.unri.ac.id

Kamisah Supian, Department Business Management, Faculty of Business, Selangor University, Zirkon 7 A/7 St., 40000 Shah Alam, Malaysia, e-mail: kamisah@unisel.edu.my

Mazni Saad, Department of Tourism, Kulliyah of Languages and Management, International Islamic University Malaysia, Pagoh Edu Hub, KM1, Pancor St., Pagoh, 84600 Muar, Johor Darul Takzim, Malaysia, e-mail: maznisaad@iium.edu.my

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