

Assessing the effects of perceived quality and perceived value on customer satisfaction

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ABSTRACT

This empirical study aims to identify the effects of different factors influencing on customer satisfaction, such as perceived quality or perceived value in a case study in chemical industry. Understanding the effects of such variables helps us manage customers properly, balancing between perceived quality and perceived value. The research design is a quantitative method and employs Structural Equation Method (SEM) to ensure the correlation between constructs. The method results confirm that perceived value contributes a stronger influence on customer satisfaction than perceived quality does. Chemical market tends to put perceived value as a priority as long as the product quality meets the standard parameter. Perceived quality is reflected more by service while there is less point of differentiation on tangible product. The paper may limit the generalization of the findings, hence the replication in other industries are encouraged.

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1. Introduction

In the business world, every company addresses customer satisfaction as company's objective since it leads to a stronger competitive position under tight competition (Fornell, 1992). Andersson and Karlström (2014) conclude that satisfaction is the most important factor in getting the long-term business. It is a common practice that the real purpose of a business relationship is to create and sustain mutual value between a seller and a buyer (Christopher et al., 2002). The value is the real benefit of products and/or services from a customer's standpoint (Walter et al., 2001). In the B2B setting, the products and/or services are evaluated by customer rationally (Taylor et al., 2007). Although it is not as strong as in B2C setting, there should be an affective factors in the B2B context (Hakansson, 1982), eventually this study focuses on rational aspects of perceived quality and perceived value only. The empirical study approach refers to the conventional view of the industrial decision making process, which tends to be more rational approach than emotional (Leek & Christodoulides, 2012). The empirical study aims to assess the impact of both rational factors on customer satisfaction; hence the finding helps industries address the proper strategy to enhance customer satisfaction. From the industrial buyer's stand point, value can be generated either from a low-cost or it is called as the price strategy, or high-quality which is called as the performance strategy (Ulaga & Chacour, 2001). Every strategy contributes a different implementation; hence initially industry must know which factor influences stronger to the customer satisfaction, either perceived value or perceived quality. As a research question of the paper, why does assessment of rational factors on customer satisfaction so necessary? If seller can assess the influence of both perceived quality and perceived value on customer satisfaction, then seller is able to generate such price inelasticity that it could even boost a customer's willingness to pay higher price, in case of very strong perceived quality in the customer's perspective (Vera, 2015). Chemical resin products are complex products in terms of quality consistency. The research focuses on some fundamental constructs: satisfaction, perceived quality, and perceived value. The reason of rational aspect analysis in the study is price concern and more technical content issue, such as product consistency and technical support that respondents always mentions during interview. Given the academic relevance of the examination object, the purpose of the paper is

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to exercise and to find the driver whose stronger influence towards customer satisfaction, either perceived quality or perceived value factor.

The paper starts with introduction, contents of the background and research questions. The subsequent, section two focuses on the conceptual framework and hypotheses development. Section three is data and research methodology measurements. The last two sections of the paper are section four which focuses on results and discussion and section five is conclusion.

2. Conceptual framework and hypotheses development

According to past studies, scholars and researchers place satisfaction as a central element of the marketing model (Churchill & Surprenant, 1982; Tse & Wilton, 1988). The basic premise of B2B decision models reflects cognitive aspects (Pandey & Mookerjee, 2018; Samudro et al., 2019). Satisfaction is the consumer's fulfilment response with the degree of pleasant or unpleasant; in another word, satisfaction is the affective output from the cognitive components of evaluation (Oliver, 1996). In this paper, satisfaction is the dependent variable of both rational variables of perceived quality and perceived value.

2.1. Perceived Quality

Perceived quality is the customer's judgement about a product's superiority (Zeithaml, 1988). In the empirical study of chemical industry, Ćorić and Jelić (2015) find chemical market concerns with consistency in product quality, safety and on time delivery in the buying decision-making process. Ćorić and Jelić (2015) highlight the necessity of product quality consistency and decent price in the purchase decision process. Some past studies examine the necessity of product quality development in the chemical industry; product development relates to environmental issues, energy cost, safety risk, and emission level (Saling et al., 2002; Shonnard et al., 2003). The industrial customer ultimately decides to purchase the product and services as a whole package, hence value is delivered to customer in terms of tangible product and intangible services (Ulaga & Eggert, 2006b). As industrial product tends to be more complex and services intensive, the after sales of technical service becomes a crucial factor to determine the performance (Persson, 2010; van Riel, de Mortanges, & Streukens, 2005), hence respondents report that technical services play a great role in the buyer's decision-making process (Ćorić & Jelić, 2015).

Product quality contributes positive impact to the industrial purchasers who are satisfied with the product performance (Baumgarth & Binckebanck, 2011; Taylor et al., 2007). The positive effect of industrial product quality on customer satisfaction has been confirmed by a large number of empirical studies (Cretu & Brodie, 2007; van Riel et al., 2005). If the tangible product has not point of differentiations, then the competition is in the service performance. Enhancing the level of service quality can help a company differentiate among the competition and achieve a competitive advantage (Ganguli & Roy, 2011). In this empirical study, perceived quality is reflected by product quality and services dimensions. Service dimensions refer to the RATER concept of Parasuraman et al. (1985), but excludes tangible dimension, since it is not relevant in this context; hence service dimensions are reliability, assurance, empathy and responsiveness. The analysis of both product quality and services performances are necessary to further strategy and implications. Service is an activity or benefit that the seller delivers to the buyer or prospect (Kotler & Armstrong, 2018). Grönroos (2004) defines service as an interactive process between customers and employees, physical resources, products, or systems and the effect of perceived service quality on customer satisfaction (Hong & Goo, 2004). Service quality is an organizational asset and a crucial part that influences financial performance (Kassim & Asiah Abdullah, 2010). Conceptually, service is a crucial part that contributes to the company performance significantly. Meanwhile, Zeithaml et al. (2018) develop a model with positive relationship between service quality and customer satisfaction where the service quality is reflected by five dimensions of RATER concepts of Parasuraman. In the American Customer Satisfaction Index (ACSI) model and in the European Customer Satisfaction Index (ECSI), perceived quality influences customer satisfaction positively (Askariadz & Babakhani, 2015; Fornell et al., 1996; Susanti et al., 2019b). Some past studies confirm the positive relationships between perceived quality and customer satisfaction (Baumgarth & Binckebanck, 2011; Cretu & Brodie, 2007; Taylor et al., 2007; van Riel et al., 2005).

2.2. Perceived Value

The most common concept of perceived value is the customer's benefits (in terms of core solution and additional services) towards sacrifices (in terms of price and relationship costs) (Grönroos, 1997). The concept compares what benefits customer get and what cost customer gives in the interaction between buyer-seller. Hence it is a trade-off since buyer always concern with the cost or economic elements and this concept does not take into account the social and emotional component (Eggert et al., 2006; Ulaga & Eggert, 2006b). Skrzypek (2012) defines economic effectiveness as a relationship between results and expenditures, with the same essence formula as traditional perceived value. This economic effectiveness triggers a competitive advantage (Samudro et al., 2018). Man et al. (2011) introduce the cost for the entire life cycle of the product respecting quality standards. The related quality cost of chemical product is all costs incurred at pre-application, during application and after application. If the chemical product application fails, the buyer shall bear the end product's failure, either sell at a downgraded price or even dispose of it all. From the concept of cost description (Man et al., 2011) and product quality (Ćorić & Jelić, 2015), the combination of both concept is the proper perceived value model for the study, especially in the chemical industry.

Some past studies find the positive influence from perceived value to the satisfaction as the model of ACSI-American Customer Satisfaction Index (Fornell et al., 1996; Mackevičiūtė, 2013; Susanti et al., 2019a; Ulaga & Eggert, 2006a), and the model of ECSI, European Customer Satisfaction Index (Askariadzad & Babakhani, 2015). Zeithaml et al. (2018) develop satisfaction model which is integrating key drivers toward customer satisfaction, as product and services quality, as well as price. Some past studies confirm the positive relationships between perceived value and customer satisfaction (Bolton & Drew, 1991; Jayawardhena et al., 2007; Lam et al., 2004; Molinari et al., 2008; Parasuraman et al., 1988).

3. Data and Research Methodology

Based on the literatures review and past studies, authors develop the proposed model as below. From the conceptual framework, it leads us to the below hypotheses and the initial proposed model.

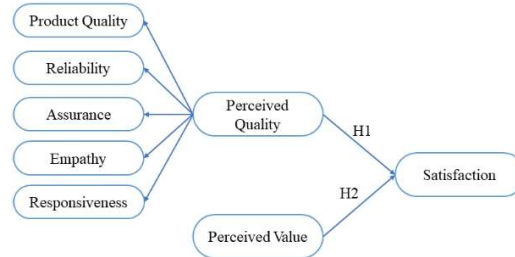


Fig. 1. Proposed model

From the conceptual framework, it leads us to the below hypotheses as follows.

- H1.** Perceived quality, which is a reflective and latent construct of the second order, captures the five constructs: product quality, reliability, assurance, empathy, and responsiveness have a significant positive influence on customer satisfaction.
H2. Perceived value influences customer satisfaction positively.

3.1. Sampling

Authors team decide to validate the questionnaires by a professional's peer review before the field research; every detail of variables indicators are validated by discussing with professionals in the related industries (Carmine & Zeller, 1979). Since the research employs the SEM method with the AMOS program, purposely to have an optimal result, it is recommended to have the minimum total sample 200 (Loehlin & Beaujean, 2017). Some various industries contribute to the research (as table 1), with the total number of 164 companies as population, 105 companies contribute to the research; hence, the response rate is 64%.

Table 1

Respondent's Company Profile

	Company		Unit Analysis	
	Quantity	%	Quantity	%
Wood-based Industry				
● PB/Particle Board	4	2.44	2	1.90
● MDF/Medium Density Fibreboard & HDF/High Density Fibreboard	3	1.83	1	0.95
● Plywood, Blockboard, Barecore, Rockwool, Filmface, Laminated Paper, Wood Decking, Parquet Flooring, and Furniture	157	95.73	102	97.15
Total	164	100.00	105	100.00

It is a common practice that respondents develop a relationship with multi suppliers; it is purposely to avoid dependence and have a better bargaining position towards sellers. Under this circumstance, authors encourage every respondent to evaluate all suppliers the respondent interacts with; therefore, every respondent contributes with two up to four questionnaires. After the field research is performed, the total collected, and valid samples are 269. It takes about five months (April 2nd to August 10th, 2018) to have in-depth interviews and collect the data in the fields. The communication and relationship between buyer and seller in a B2B setting are carried out by specific members at different levels of the companies' production, quality control, logistics, sales, and finance departments (Hollyoake, 2009; Mummalaneni, 1987). From the Table 1, respondents are dominated by plywood, blockboard, barecore, rockwool, filmface and laminated wood, with contribution 97.15% of total sample. Meanwhile particle board, medium density fibre board and high-density fibre board just contribute 2.85%. The reason is the big investment of MDF, HDF, and PB industries, compares relatively with other respondents' industries.

Table 2
Respondents' Profile by Demography

Working Experience	Owner/ Director	Manager/ GM	Staff	Production Head	QC Head	Supervisor/ Foreman
< 5 year			3	4	2	
5-10 year	8	7	5	57	14	11
> 10 year	37	24	3	32	6	4
Total=217	45	31	11	93	22	15
Total=100%	21%	14%	5%	43%	10%	7%

The field research uses census sampling, whereas technically it is performed by face-to-face and deep interviews. The major respondents are production head (43%), since production head is the direct user of chemical resin in the production process. Director and even owner also get involve in the purchase decision because chemical resin is the main material for the customer's end products.

3.2. Measurement Model Testing

The result of the overall model fit is presented in Table 3 and it confirms that all parameter results meet the standard; hence the model is a good fit (Hair et al., 2010). RMSEA is the most common parameter which is used to anticipate sample size issues and the missing standard of Chi-square. RMSEA standard: a close fit standard ≤ 0.05 and a good fit standard ≤ 0.08 , it confirms that the result is a good fit (Brown & Cudeck, 1993). Other parameters are RMR and PNFI, CMIN/df, which surpass the standard; meanwhile, CFI and TLI are marginal fit. All parameter results are reflected in Table 3.

Table 3
Overall Model Fit

No	Goodness of Fit	Standard	Result	Remark
1	RMSEA <i>Root Mean Square Error of Approximation</i>	$\leq 0,08$	0,065	<i>Good fit</i>
2	RMR <i>Root Mean Square Residual</i>	$\leq 0,05$	0,028	<i>Good fit</i>
3	CFI <i>Comparative Fit Index</i>	$0,80 \leq CFI < 0,90$	0,850	<i>Marginal fit</i>
4	PNFI <i>Parsimonious Normed Fit Index</i>	$> 0,50$	0,697	<i>Good parsimonious fit</i>
5	TLI <i>Tucker-Lewis Index</i>	$0,80 \leq TLI < 0,90$	0,838	<i>Marginal fit</i>
6	CMIN/df <i>The related Chi-square statistics</i>	$< 3,00$	2,128	<i>Good</i>

90% confident interval for RMSEA=0.056-0.062 and p-value (close fit RMSEA<0.05)=0.00

Table 4
Factor loadings and t-value

Variable	Indicator		Lambda	t-value	Remark
<i>Product Quality (PQ)</i>	PQ1	Reject level	0,507	7,548	Valid
	PQ2	Emission and toxic level	0,462	6,940	Valid
	PQ3	Efficiency level	0,653	9,692	Valid
	PQ4	Life time	0,740	10,848	Valid
	PQ5	Durability	0,751		Valid
<i>Reliability (Rel)</i>	Rel1	Supervision consistency	0,747		Valid
	Rel2	Expertise	0,901	15,196	Valid
	Rel3	Solution accuracy	0,841	14,116	Valid
	Rel4	Solution speed level	0,809	13,492	Valid
<i>Assurance (Ass)</i>	Ass1	Capability	0,782		Valid
	Ass2	Supply assurance	0,695	11,517	Valid
	Ass3	Performance consistency	0,530	8,474	Valid
	Ass5	Technical reputation	0,621	10,058	Valid
	Ass6	Service assurance	0,697	11,453	Valid
	<i>Empathy (Emp)</i>	Emp1	Technical attention	0,692	8,704
Emp2		Personal attention	0,728	8,992	Valid
Emp4		Understanding	0,570		Valid
Emp5		Flexibility of technical team	0,698	8,771	Valid
Emp6		Flexibility of sales team	0,671	8,603	Valid
<i>Responsiveness (Res)</i>		Res1	Technical information sharing	0,641	10,059
	Res2	Information sharing	0,598	9,351	Valid
	Res3	Technical respond accuracy	0,832	12,877	Valid
	Res4	Technical respond speed level	0,771	11,925	Valid
	Res5	Sales respond accuracy	0,721		Valid
	Res6	Sales respond speed level	0,717	19,210	Valid
<i>Perceived Value (PV)</i>	PV1	Product value	0,746		Valid
	PV2	Technical solution value	0,749	11,684	Valid
	PV3	Service value	0,703	10,970	Valid
	PV4	Economic price	0,577	8,958	Valid
	PV5	Proportionate value	0,719	11,360	Valid

Note: All items are collected and bundled using the top and bottom two boxes first. The cluster data are measured by using a 5-point Likert scale with the following anchors: 1 = fully disagree and 5 = fully agree.

The second step is conducting a measurement model fit of 32 indicators. The indicator standard is 0.50 as a minimum factor loading (Hair et al., 2010) and the t-test value ≥ 1.96 . The coefficients between the constructs have a minimum threshold of 0.05 with a t-test value > 1.96 (Igbaria et al., 1997). This analysis separates product and service quality; service quality itself is analyzed by its dimension based on the Parasuraman-RATER concept, without an irrelevant tangible variable. All these indicators are valid and contribute their constructs significantly, as reflected in Table 4. A minimum threshold of 0.50 average variance extractive (AVE) for each construct indicates that the construct has favorable discriminant validity (Hair et al., 2010). The minimum threshold of construct reliability 0.70 (CR) indicates the reliability and consistency of the measurement indicators (Hair et al., 2010). According to Table 5, every construct passes the minimum suggested threshold of CR. Four constructs have AVE less than 0.50, but their CR passes the minimum threshold of 0.70.

Table 5
Construct Reliability (CR) and Variance Extracted (VE)

No	Latent Variable	Symbol	VE	CR
1	Product Quality	PQ	0,402	0,764
2	Reliability	Rel	0,683	0,896
3	Assurance	Ass	0,449	0,824
4	Empathy	Emp	0,454	0,805
5	Responsiveness	Res	0,515	0,813
6	Perceived Value	PV	0,492	0,828

4. Results Discussion

In the structural model test, both hypotheses are verified by the estimated coefficient and t-value for significant status.

Table 6
Structural Model Coefficient and t-value

No	Pathline	Hypothesis	Coefficient	t-value	Conclusion
1	Perceived Quality \rightarrow Satisfaction	H1	0.359	4.184	Supported
2	Perceived Value \rightarrow Satisfaction	H2	0.520	5.969	Supported

Note: Coefficient that is significant at the .05 or lower level (one-tailed) are in bold

From Table 6, the path coefficient of perceived quality-satisfaction (Coefficient: 0.359 and t-value 4.184) indicates that perceived quality influences satisfaction positively; the result does support H1. Meanwhile, perceived value influences satisfaction positively (Coefficient: 0.520 and t-value 5.969) relatively stronger than perceived quality does. Although the product quality has to meet the standard parameter, customers want to ensure that the product quality is worth enough to spend on it. The result suggests that the chemical market tends to reckon price toward product quality. Five dimensions reflect perceived quality: the first is product quality, and the other four are services, like reliability, assurance, empathy, and responsiveness. Refer to the coefficient result; perceived quality is more reflected by services than product quality itself.

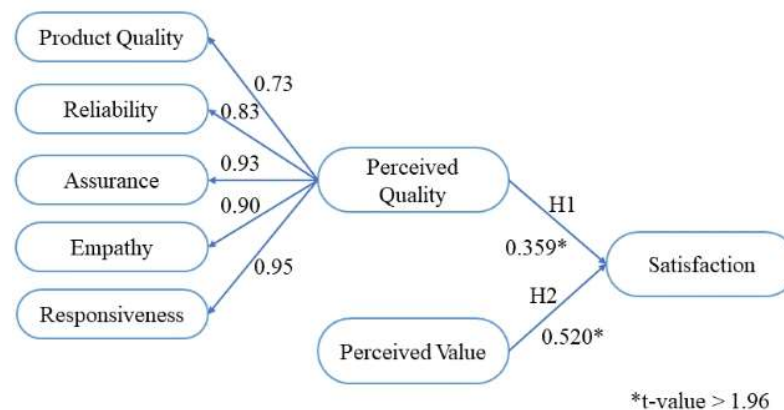


Fig. 2. Final model and path coefficient

This empirical study aims to answer the question, ‘which factor has a stronger influence on the satisfaction in the chemical market, either perceived quality or perceived value?’ The first major contribution of the study is the confirmed model and the finding of the stronger influential factor for satisfaction, which is perceived value (coefficient 0.520 and t-value 5.969). Purposely to explain the first major finding, we start with the positive influence between perceived quality and satisfaction (coefficient 0.359 and t-value 4.184). In this study, the chemical market considers product quality in terms of quality consistency:

the emissions and toxicity level, the reject level, lifetime, and durability. From the economic point of view, although quality must meet the set parameters, the chemical market keeps monitoring cost. In the respondents' industry, efficiency is measured in terms of cost during consumption in the end product. As long as the quality parameter is still within the acceptable standard range, then the chemical market will choose the most efficient chemical product.

The justification of the first finding is the low technology of chemical resin, so that every chemical resin manufacture has the ability to adopt the technology. Every quality improvement can be duplicated by every chemical manufacture fast, hence chemical market tends to evaluate product quality based on performance consistency. Although chemical companies try to get a competitive advantage from services, it does not contribute a significant impact to the value. The implication of the first finding is the seller's effort to get the most efficient chemical product. The seller's R&D team will make an effort to get a chemical formulation with the lowest cost while still meeting the parameters or fitting into the customer's quality standard range. Sales and technical people will work together to penetrate the market. From a technical standpoint, the application result will come with an economic benefit such as savings.

The second contribution of the study is the second order analysis of perceived quality. When all the chemical sellers meet all these indicators of product quality performance, the focus will switch to the additional services. It means that there is less significant point of differentiation in terms of the product quality itself. Hence the customer evaluates and perceives quality performance from the standpoint of the service. Refer to the dimension coefficient, where perceived quality is reflected more strongly in the service dimension than the product quality dimension: product quality (0.73); service dimension is reliability (0.83), assurance (0.93), empathy (0.90) and responsiveness (0.95). The justification of the second finding is due to the tendency of product commoditization in the chemical resin industry. From the customer's perspective, as long as the product meets to the parameter range, then customer review to the cost. Seller try to avoid commoditization by enhancing services performance. This is the background why perceived quality is reflected by services dimensions stronger than tangible product does.

The implication of the second finding is necessary to focus more on customer service to get a competitive advantage purposely. This finding supports the past study, when the chemical product has got to the point of differentiation in terms of the functional characteristic, then the seller seeks a point of differentiation in additional service (Ćorić & Jelić, 2015). Responsiveness level is the most robust service dimension; responsiveness is about speed and accuracy level in responding to technical and commercial issues. The ideal site location is in the middle of the chemical market concentration so that the seller can respond fast in case of any technical and operational issues. The proper recruitment and development of people becomes necessary as they relate to service performance.

5. Conclusion

On the basis of the data analysis, the author has made several critical conclusions. First, product quality influences customer satisfaction, but quality performance must be valued proportionately. The chemical market will prefer the cheaper product as long as the quality performance meets or is still within the standard parameter range. In other words, perceived value influences satisfaction stronger than perceived quality does. Second, perceived quality is reflected stronger by service value than by product quality. Product quality is similar across the industry; hence, the seller seeks a point of differentiation by offering additional services. The research findings will be beneficial for similar industries, but it might be challenging to implement them in other industries. The research results may limit the generalization of the findings. Future research may be necessary to replicate them in other similar industries.

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