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Joint Business-to-Business recovery management: the moderating role of locus of failure

N. Nik Bakhsh* and I. Riivits-Arkonsuo

Tallinn University of Technology, School of Business and Governance, Department of Business Administration, Akadeemia Tee 3, EE19086 Tallinn, Estonia
*Correspondence: Naghmeh.nikbakhsh@yahoo.com

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Abstract. Agricultural machinery manufacturers and services providers increasingly experience failure in core products and service deliveries. Despite the importance of recovery management in context, scant research exists on studying recovery management, collaborative recovery activities, and the impact of joint recovery management on post-recovery relationship quality. More pressing is the lack of research on the impact of relationship quality on the customer's intention of future co-recovery activities. Using an experimental design with data from 30 agronomy machinery and equipment manufacturers and service providers in Iran, we investigate how customers' perception of relationship quality is influenced by the interplay of locus of failure and supplier recovery tactics (non-co-creation of recovery vs co-creation of recovery). The results reveal the locus of failure, interacts with the supplier recovery tactics to impact the customers' perceptions of relationship quality. Finally, all three dimensions of relationship quality (satisfaction, trust, and commitment) positively impact the customers' intention for future co-recovery activities.

Key words: business-to-business, co-creation, joint recovery management, locus of failure, relationship quality, agronomy machinery, agronomy services.

INTRODUCTION

One of the industries that experience failure frequently is agricultural machinery and services. The failure in supplying of items and materials by suppliers can cause a domino effect across the customers' business network, interrupt the farm operations, cause severe damage to the farm products (Afsharnia et al., 2014), restrain the customer relationships, and threaten the long-term profitability of the supplier firm (Döscher, 2013; Zhu & Zolkiewski, 2015; Borah et al., 2019; Baliga et al., 2020). Since the supply of high-quality agricultural machinery, equipment, and services are essential for farms' production growth as the end-users (Civcisa & Grislis, 2014; Gedzurs, 2016; Skarkova et al., 2016; Mitrofanovs et al., 2019; Buisson & Balasubramanya, 2019, Hu et al., 2020) and the manufacturers/service providers in this industry are highly dependent on their suppliers, an effective recovery management system is required to exert a positive impact on the post-failure quality of relationships and the financial performance of machinery and equipment supplier firms (Döscher, 2013; Sajtos & Chong, 2018). The recovery

management might also need the close collaboration between the suppliers and customers in the agronomy machinery industry as the supplier and customers are highly dependent and the collaborative activities might be needed to reinforce the relationship quality in this industry (Kukk & Leppiman, 2016; Franklin & Marchall, 2019; Hollebeek, 2019; Zhung et al., 2020). Up to now, however, far too little attention has been paid to the impact of joint recovery management on post-failure relationship quality in the agronomy machinery industry.

With the sensitivity of the agricultural machinery and services industry (Civcisa & Grislis, 2014; Gedzurs, 2016; Skarkova et al., 2016; Buisson & Balasubramanya, 2019; Mitrofanovs et al., 2019), the questions become: What happens to the customers' perception of relationship quality when the failure recovery is jointly created and implemented in this industry? More specially, does the customers' perception of post-failure relationship quality increase when the recovery is jointly created? Does the locus of failure impact the customers' perception of relationship quality after joint recovery management? Does the high relationship quality encourage the customer to participate in future recovery activity? These questions represent a significant gap in business marketing literature and focus on this research.

Answering these questions requires integrating two independent streams of marketing literature: research on value co-creation (Nammir et al., 2012; Chathoth et al., 2016; Kukk & Leppiman, 2016) and the B2B recovery management (Döscher, 2013; Baliga et al., 2020). Therefore, drawing on S-D logic and social exchange theory, the purpose of this research is two-folded: first to bridge the gap in the literature by investigating the relationship between the customers' perception of relationship quality and customer intention in future co-recovery in agricultural machinery and services industries environment. Second, to examine the role of locus of failure in the relationship between the joint recovery management and customers' perception of relationship quality.

CONCEPTUAL FRAMEWORK

Joint recovery management and relationship quality

We define failure as potential problems in service/product delivery and performance. Therefore, the failure in the agronomy machinery industry may be caused by different resources such as supplier-side problem (failure in upstream, internal, and downstream activities), the customer-side problem (internal customer problem, failure to provide the supplier with correct information, failure to use the service/product in a proper way) and the environmental factors such as natural disasters (Zhu & Zolkiewski, 2015). The recovery management in B2B context refers to 'A systematic approach for the development, implementation and controlling of activities by the seller firm to handle product or service failures to regain customer satisfaction and attain customer retention in the context of business-to-business markets' (Döscher, 2013, p. 18). In this definition, the failure responsibility has been attributed only to the supplier firm. Because typically, the suppliers shoulder the responsibility of failure activities based on the contractional agreement between supplier and customer (Döscher, 2013, Baliga et al., 2020). However, based on the S-D logic customers are active actors in the business processes (Grönroos, 2011; Kukk & Leppiman, 2016; Hollebeek, 2019). Under dominant service logic (S-D Logic), the value can be jointly created by customer and supplier through collaborative processes, interaction, and resources integration at different service chain

stages from service delivery to service recovery (Vargo & Lusch, 2004; Kukk & Leppiman, 2016).

One interesting example of the collaborative process is when customers engage in recovery activities or co-create the recovery activities with the supplier/service provider (Park & Ha, 2016; Bagherzade et al., 2020) through which the value can be co-created with the interaction and integration of resources. However, much less is known about joint recovery management in the agronomy machinery and services context indicating a need for a definition to develop our understanding of joint recovery management in this context. Therefore, drawing on S-D logic (Vargo & Lusch, 2004) and B2B service recovery definition (Döscher, 2013), we define the joint recovery management as:

'The suppliers and customer's interaction and the investment of operand and operant resources to jointly prevent, handle and resolve the product or service failures through which values are driven in the context of business-to-business market'

Besides, researchers have failed to address the impact of joint recovery management on the customers' perception of relationship quality between supplier and customer firm in the B2B environments (e.g., Döscher, 2013; Zhu & Zolkiewski, 2015; Baliga et al., 2020), particularly in agronomy machinery settings. The relationship quality implies on the strength of the relationship between supplier and customer firms in the context of business-to-business markets (Holmlund, 2008; Grégoire et al., 2009) and conceptualized as a higher-order construct of satisfaction, trust, and commitment (Döscher, 2013; Itani & Inyang, 2015). The relationship satisfaction judgment is associated with the development of cumulative relationship satisfaction, which is substantially influenced by the occurrence of critical incidents in the relationship (Döscher, 2013). In comparison, the construct of relationship trust has been referred to the 'Confidence in the exchange partner's reliability and integrity' (Morgan & Hunt 1994, p. 23). Trust has been identified to be related to partner reliability, honesty, and benevolence (Winklhofer et al., 2008). Commitment is said to occur when one party believes the business relationship is sufficiently important to warrant maximum effort to maintain it indefinitely (Segarra-Moliner et al., 2013). In addition, some contingency factors might impact customer responses to the failure situations in this environment. Some of these notable factors might be the existing alternative suppliers in their network, the length of the relationship, switching cost, reciprocal supply agreement, and the locus of failure (Döscher, 2013; Baliga et al., 2020). In this paper, we focus on the role of locus of failure as the important moderating factor that might impact the relationship between joint recovery management and the post-failure relationship quality in the agronomy machinery industry.

Hypothesis Development

According to S-D logic, value co-creation through collaborative activities requires a high level of interaction and resource investment from both sides of an exchange. Recovery management is essentially a social exchange (Patterson et al., 2006), and based on the social exchange theory, resource integration happens if the parties receive values from the exchange (Kotler & Zaltman, 1971). This value is related to the trade-off between the benefits driven by activities and the sacrifices of resources (Grönroos, 2011). Therefore, joint recovery management might have different relational outcomes based on the values driven from the collaborative recovery activities versus customer resource sacrifices. On the other hand, the relational outcomes of joint recovery management

might be affected by several factors (Heidenreich et al., 2015), such as the locus of failure. The locus of failure was perceived to impact the recovery management activities in the business environment (Zhu & Zolkiewski, 2015). In this paper, we argue that the locus of failure might play the moderating role in the relationship between joint recovery management and the customer perception of relationship quality. According to Döscher (2013), the recovery activities are defined in contractual agreements, and the recovery responsibility should be held on the supplier side. Also, customer firms hold less knowledge of the internal process and products/ services used in supplier firms; then they reflect the fewer competencies for identifying, analysing and resolving failures. Moreover, joint recovery management requires customer resource contribution, time, and effort.

If the problem is on the supplier side, the customer side's resource contribution might be perceived by customers as an extra loss, cost, and waste of resources. According to social exchange theory, the investment and exchange of resources happen when the exchange parties perceive the value in participation. When this value decreases, the customers might display less satisfaction, commitment, and trust in the supplier's relationship. Then, the joint recovery activities in this condition might negatively impact their perception of relationship quality. However, when the locus of failure is on the customer side, the resource contribution of supplier and their efforts into the solution of failure might increase the customers' perception of relationship quality. Since the supplier resource investment into failure recovery through the joint recovery management exceeds their contractual obligations, customers perceive a higher value driven from the recovery activities. They might display a higher level of trust, commitment, and satisfaction with the supplier and the business relationship. With the impact of the environmental factors on the service failures (Zhu & Zolkiewski, 2015), the joint recovery activities might increase the perception of relationship quality. Since the locus of failure is not from the supplier side, customers have clearer roles as participants in the recovery process, they receive an amount of control over the recovery activities and help find the optimal solution. Therefore, they perceive much more value in investing in their resources in the recovery activities and consequently perceive greater relationship quality. Based on the discussion above, we compare the customer perception of relationship quality when failure is caused by suppliers, customers themselves, and an environmental factor.

H_{1a}: when the locus of failure is on the supplier end, the joint recovery activities lead to a lower perception of relationship quality rather than when the locus of failure is on the customer end.

H_{2b}: when the failure is caused by an environmental factor, the joint recovery activities lead to a lower percepetion of relationship quality rather than when the locus of failure is on the customer end.

H_{1c}: when the failure is caused by an environmental factor, the joint recovery activities lead to a higher perception of relationship quality rather than when the locus of failure is on the supplier end.

The relationship quality and the intention for future co-creation

It has previously been observed that the relationship quality plays also a prompting role in customer engagement in business activities (Bowden, 2009; Hollebeek, 2011). This agrees with Chathoth et al. (2016), who suggest that customer engagement evolves from quality relationships between the customer and the supplier firm. The pre-established relationships based on satisfaction, commitment, and trust can also act as the antecedent to customer engagement (Hollebeek, 2011; Kumar & Pansari, 2016). According to the social exchange theory and S-D logic, we argue as the customers' satisfaction, trust and commitment with/to supplier increase they might be are more eager to participate in future joint recovery activities. More specifically, with a high perception of relational values, they might be more eager to invest their resources in supplier interactions to participate in future recovery activities. Fig. 1 represents the research conceptual model.

H_2: The higher perception of relationship quality is positively related to the customer intention for future joint recovery activities.

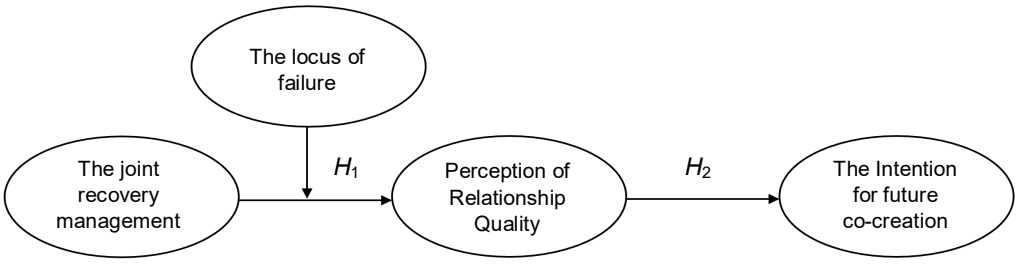

Figure 1. Conceptual model.

MATERIALS AND METHODS

Research design

We employed scenario-based experiments, to collect research data and test the research hypotheses. The scenario-based experimental design is currently the most popular method for evaluating service encounters involving both failure and recovery (i.e., Park & Ha, 2016; Nik Bakhsh, 2019). The scenario-based experimental design was chosen to avoid the biases associated with the retrospective self-reports, such as memory lapse and rationalization tendencies, and consistency. It is also one of the more practical ways of operationalizing the manipulations, which provides control over uncontrollable variables (Smith et al., 1999).

To test the H_{1a}, H_{1b}, and H_{1c} hypotheses, we used three single factor 2(co-creation vs no co-creation of recovery activities) × 2 (locus of failure) experimental design. To test the H_2, a regression analysis was conducted on the pooled data gathered from all participants of the research. Multiple methods have been employed to develop the scenarios, starting with a depth qualitative interview with nine managers to generate service breakdown ideas suitable for our study, brainstorming, and small group surveys. The scenarios were evaluated based on the criticality, frequency, and similar experiences (Dong et al., 2008). The final six scenarios were different based on the locus of failure's attribution. They described a delivery situation where the customer ordered

machinery/equipment or service to the supplier when the items arrived/delivered the quantity/quality of product/service did not meet the customer expectation. In each experiment, the cause of failure varied depends on the locus of failure. In the first experiment, after the quality/quantity check from the customer side and contacting the supplier, the problem was from the supplier side and then manipulation is applied to the approach that the supplier has taken to solve the failure (co-creation vs non-co-creation). The supplier either resolved the problem themselves or asked a customer to help with the resolution with amending the items, contact other suppliers, etc. In the second experiment, the failure is caused by an environmental factor (natural disasters and unstable weather conditions); therefore, none of the parties could be held responsible for the failure situation. Again, in one scenario supplier initiate the recovery activities and, in another scenario, the customer has been asked to help with the solution. In the third experiment, it is found out the problem has been from the customer firm side themselves since they placed the wrong order or inappropriately used the items/service, then with the help of supplier they find a solution and implement it. Then, either supplier helps the customer firm to solve the failure situation, or customer's employees solved the problem themselves. We compared the customer perception of relationship quality among the experimental groups. Respondents read one of these six versions of the scenario and rated their agreement on a seven-point Likert scale, which enabled us to compare the customer perception of relationship quality among the experimental groups. Besides, including in the description of scenarios, the other contingency factors such as length of the business relationship, number of previous failures, the number of alternative suppliers in the business network, and the switching cost were similar across all experiments.

Sample

The subjects in our experiments were top, middle level, and operational managers working within agricultural machinery manufacturer or service providers in Iran. We contacted 40 firms listed in a B2B services business directory, Industrial Management Institute in Iran. Most of the studied firms were medium-big sized companies with an average size > 200 full-time employees and an average age of 10 years. After identifying the target companies, 30 firms met the criteria and accepted to participate in this study.

Then we assessed all potential knowledgeable respondents through initial contact by email and ensured all 270 respondents are knowledgeable employees on the business relationship with the suppliers, have been familiarized with the concepts of failure recovery, and have experienced at least one service/product failure over previous two years. Then, the, 36% supply manager, 21% outbound preparation manager, 19% purchaser, 10% senior manager (CEO and vice president), 10% quality managers and 4% others. 60% of the respondents had over nine years of working experience; 30% had between 5 and 9 years, and 10% had less than five years. In the cover letter accompanied by the questionnaire, informants were guaranteed confidentiality. Finally, 210 usable questionnaires were received constituting a response rate of 62%. No questionnaires were returned incomplete.

Manipulation check

The manipulations were pre-tested on a sample of operational and middle managers (n = 60). The manipulation of the supplier's recovery strategy in the first and second

experiment was operationalized using the statements: 'Customer was asked to help develop and implement the solution' or 'The development of solution and implementation of it all done by the supplier without customer engagement'. Moreover, the manipulation of the recovery strategy in the third experiment was operationalized using the statements 'Supplier was asked to help develop and implement the solution 'or 'The development of the solution and implementation of it all done by the customer without supplier engagement'. Participants read one of the two versions of the scenario and rated their agreement that the recovery was co-created on a seven-point Likert scale. The *t*-test revealed that in the first version of the scenario respondents agreed that the recovery was co-created, but not in the second version (co-created recovery: *mean* = 5.15, non-co-created: *mean* = 2.81, $t = 10.93$, $p < .001$).

Measurement properties

The independent variable of the locus of failure was measured by three items developed by Maxham & Netemeyer (2002). This scale has been previously used to capture the attribution of failure responsibility. The dependent variable of relationship quality was captured by the three sub-constructs including the relationship trust (three items), relationship commitment (four items), and relationship satisfaction (three items) were adopted from Ulaga & Eggert (2006). Since no prior established scale was developed to measure customer intention toward future co-creation in B2B context, therefore we used the scale of 'Repurchase intention' introduced by Homburg et al. (2003). These 16 items were then subjected to confirmatory factor analysis (CFA) using SPSS (v. 20). After refinement, a final CFA model was estimated that demonstrated good measurement properties. *CMIN/df* = 1.06, *GFI* = 0.96, *AGFI* = 0.92, *CFI* = 0.97, *NFI* = 0.93, *IFI* = 0.97, and *RMSEA* = 0.053. The observed significant *Chi-square* = 76.280 (*df* = 35) was an appropriate Average Variance Extracted (*AVE*) > 0.63 (Fornell & Larker, 1981) were the evidence of discriminative validity of constructs, the factor loadings were all significant (*t-values* between 11.7 and 18.3) as the evidence of convergent validity, only one item (from commitment items) being omitted (factor loading < 0.5). All construct reliabilities were acceptable (0.72–0.91) (Cronbach,1951). Table 1 presents the result of CFA.

Table 1. Confirmatory factor analysis

Constructs and measures	Standardized parameters estimate	*T-value*	Average variance extracted	Reliability
Attribution of locus of failure			0.63	α = 0.87
To high extent the supplier was responsible for the problem that we experienced	0.79	14.7		
The problem that we encountered was all supplier's fault	0.73	12.3		
To high extent we blame the supplier for the problem	0.83	11.9		
Trust			0.66	α = 0.91
We believe, this supplier keeps promises to us	0.71	13.5		
We believe this supplier is always concerned that our business succeeds	0.80	14.2		

Table 1 continued

We believe, this supplier is also trustworthy in future	0.91	14.8		
Commitment			0.66	α = 0.72
Our firm genuinely cares about out business relationship with this supplier	0.88	18.3		
The relationship with this supplier deserves our business maximum effort to maintain	0.74	16.4		
Satisfaction			0.58	α = 0.75
Despite this problem, our firm is very satisfied with this supplier	0.83	15.6		
Our firm would still make order to this supplier if we had to do it all over again	0.71	14.1		
Despite this problem, we are very pleased with what this supplier does for us	0.84	14.9		
Intention toward future co-creation			0.54	α = 0.75
We will choose to collaborate with this supplier next time we encounter with a problem	0.71	12.3		
We collaborate this supplier and invest our resources to prevent, analysis, and solve the problem again if we had a choice	0.82	15.7		
We will choose to collaborate with this supplier next time we encounter with a problem service	0.67	11.7		

RESULTS AND DISCUSSION

Using Excel version 2018, we conducted three ANOVAs to analyze the differences among group means in our sample and to test each hypothesis with the perception of relationship quality as the dependent measure. These experiments were designed to test the moderating impact of the locus of failure on the customers' perception of relationship quality.

The manipulation included two recovery approaches, co-created recovery vs non-co-created recovery. Participants from the first group ($n = 68$), in which the locus of failure is on the supplier side, randomly assigned to one of the two experimental conditions (co-created recovery vs non- co-created recovery). Participants from the second group ($n = 72$), in which the failure caused by an environmental, randomly assigned to one of the two experimental conditions (co-created recovery vs non-co-created recovery). Similarly, participants from the third group ($n = 70$), in which the locus of failure is on the customer side, randomly assigned to one of the two experimental conditions (co-created recovery vs non-co-created recovery).

The first experiment was designed to test H_{1a}. An ANOVA with the first and third groups was conducted to compare the perception of relationship quality between the first and third groups. The result (F (35.4) > *Fcrit* (2.60) and *p-value* < 0.05) revealed that respondents felt a greater sense of relationship quality when the locus of failure is on the customer side, and the recovery is co-created. It is apparent from Fig. 2 that as expected, the sense of relationship quality decreases when the recovery is co-created, and the locus of failure is on the supplier end. Overall, the sense of relationship quality is higher with

non-co-created recovery when the failure is caused by the supplier. The first hypothesis is supported. Fig. 2 illustrates the result of the first experiments.

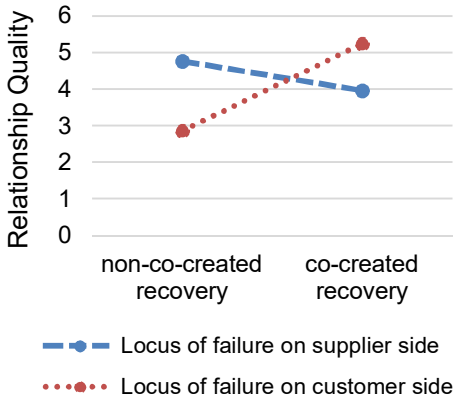

Figure 2. The recovery approach × The locus of failure (supplier vs customer side).

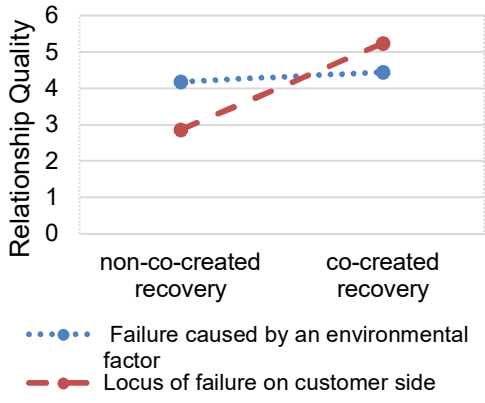

Figure 3. The recovery approach × The locus of failure (customer side vs environmental factor).

Similarly, in experiment two, an ANOVA with the second and third groups was conducted to test H_{1b}. The result is illustrated in Fig. 3. What is striking is the continual growth in all respondent's sense of relationship quality when the recovery is co-created; however, the relationship quality increases sharply for the respondent who perceived the locus of failure was on the customer side rather than an environmental issue (F (29.2) > $Fcrit$ (2.60) and p-$value$ < 0.05). These results provide further support for the H_{1b}.

It is apparent from Fig. 4 that as expected, the sense of relationship quality decreases when the recovery is co-created, and the locus of failure is from the supplier side rather than an environmental issue. The figure below shows that the co-creation of recovery slightly increases the sense of relationship quality when an environmental issue causes failure. In contrast, moving toward the co-creation of recovery, the sense of relationship quality decreases when they believe that the failure is due to the internal supplier issue. The result of ANOVA (F(42.4) > $Fcrit$(2.60) and p-$value$ < 0.05) supported the H_{1C}.

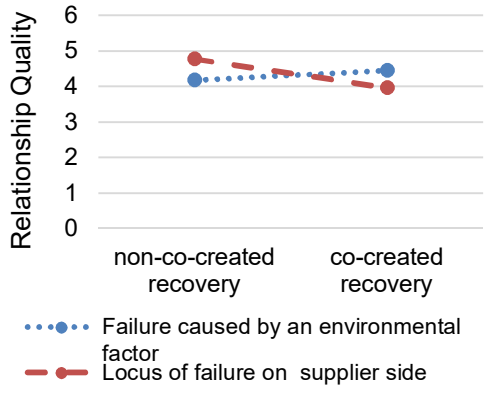

Figure 4. The recovery approach × The locus of failure (supplier vs environmental factor).

We analyzed the impact of relationship quality dimensions on the customers' intention of future co-creation recovery (IFCR) on the pooled data from our respondents (n = 139) using the regression analysis in Excel 2018. The adjusted R^2 value for the IFCR equations was .61 for pooled data from all research participants. The results indicate that perceptions of trust, commitment, and satisfaction were all significantly positively

associated with IFCR. The construct trust had the largest standardized coefficient ($\beta = 0.298$) followed by commitment and satisfaction ($\beta = 0.236$ and 0.191, respectively). Therefore, the result of regression provides strong evidence of a considerable amount of variance in IFCR is explained by the relationship quality constructs across all respondents: relationship trust, commitment, and satisfaction.

The findings reported here also shed new light on the role of locus of failure because of its unavoidable impact on customer response to joint recovery management in the agronomy machinery and services industry. More specifically, our study highlights the importance of locus of failure in the relationship between the co-creation of recovery and the relationship quality, which further impacts the customers' intention of future co-creation recovery. Therefore, it established a basis for promising future academic research on the recovery management in B2B environment particularly the agronomy industry.

The first question in this research was related to joint recovery management's impact on the customers' perception of relationship quality when the recovery activities were jointly created. The current study found that joint recovery management impacts the customers' perception of relationship quality. However, the type of impact (negative vs negative) depends on the attribution of locus of failure. The second question was designed to shed more light on the role of attribution of failure responsibility, which resulted in the most prominent finding from this study. According to our results, the locus of failure plays a moderating role in the relationship between joint recovery management and customers' perception of relationship quality. Therefore, in general, moving the locus of failure toward the customer side, the customers' perception of relationship quality increases significantly.

More specifically, when the locus of failure is attributed to the supplier side, customers are less likely to show a significant perception of relationship quality with joint recovery management activities. Our findings are supported by the social exchange theory and S-D Logic, as the recovery activities by the supplier reflect the contractual obligations when customer attribute the locus of failure to the supplier side activities, they hold expectations that supplier should comply with the failure handling procedures themselves as it is defined in their contractual agreements (Döscher, 2013). Therefore, the joint recovery management that required the customers' investment of their resources, might not add extra value for customers and might not be perceived by customers as increased outcomes from the exchange relationship. Since joint recovery management outcomes are not apparent to customers, their trust, commitment, and satisfaction on the relationship with the supplier decrease. The joint recovery management in the business market reflects a negative impact on the customers' perception of relationship quality. Another possible explanation for this might be that the customer firms likely hold increasingly less knowledge on the supplier's internal core procedure and products, or services used in their products or services. They believe the identification, the analysis of failures, response to the failure, resolution and controlling of them (Döscher, 2013) should largely remain with the supplier. This result also may be explained by the fact that despite the importance of failure notification, rapport of employees, feedback and explanation, and amount of cognitive control customer firms receive from the co-creation of recovery, when customers attribute failure and recovery activities more to the supplier firm than to themselves or an environmental factor, they may experience a negative impact on their role clarity and

perceived value. The yields in this study were higher than those of other studies in the consumer market that showed the positive impact of co-creation of recovery on customer post-recovery responses (Gohari et al., 2016; Park & Ha, 2016; Nik Bakhsh, 2019; Bagherzade et al., 2020). Interestingly, the customers' perception of relationship quality increases when the locus of failure to their side. Since the supplier contribution and resource investment to failure recovery exceed the supplier's contractual obligations, customers perceive a higher value in joint recovery management as an exchange situation. Therefore, based on the social exchange theory, they see extra values driven from the supplier resource contribution to the failure recovery activities. As a result of these extra values from joint recovery management, they might have perceived higher satisfaction, commitment, and trust in the supplier's exchange relationship. Another important finding was the failure situation when an environmental factor caused the failure. Our findings revealed that, in this situation, joint recovery management increase the perception of relationship quality in customers. This result may be explained by the fact that the rapport of employees, feedback of employees of the supplier as well as the empowerment and the clarity of role can be played by the customer, are valued by the customer. This might result in a positive outcome when customers' tradeoff their investment of resources and the value driven by joint recovery management. Therefore, joint recovery management increases the perception of relationship quality in customers. Consistent with Vargo & Lusch (2004), the co-creation of recovery positively impacts the perception of relationship quality, except when the attribution of locus of failure is on the supplier side.

To answer the third research question, we tested the relationship between the relationship quality dimensions (trust, commitment, and satisfaction) and the intention for future co-creation of recovery. Strong evidence of the positive association between relationship quality and the intention for future co-creation of recovery was found from the regression analysis. This finding broadly supports other researchers' work in this area linking co-creation and engagement activities with relationship quality (e.g., Hollebeek, 2019). It is also consistent with that of Chathoth et al. (2016) who argue that customer engagement evolves from the high relationship quality relationship. These relationships may partly be explained by customer's extra value in co-creation activities driven by customer trust, commitment, and satisfaction from the business relationship with the supplier.

CONCLUSION

The agronomy machinery manufacturers and service providers are frequently experiencing failure in their product and service delivery (Afsharnia, 2014) caused by different sources. Since the failures can make a butterfly impact on the farms and end user, there is a vital need for designing and implementing an effective recovery management system for the resolution of failure and reinforcing the relation quality after such incidents. Because of the high dependence of suppliers and customers in this industry, joint recovery management is introduced as a remedy in this study, and the moderating impact of locus failure on the relationship between joint recovery management and relationship quality is tested. Next, the authors examined how the perception of relationship quality encourages the customers to engage in future joint activities in this context.

In reviewing the agronomy literature, no data was found on joint recovery management and its relational outcome in agronomy research. Therefore, this study set out to extend our knowledge and understanding of the joint recovery management in the agronomy machinery and services market in which the high interaction between supplier and customer is essential to prevent and handle the failure situation and later avoid the failure domino effect on the farm productions.

The findings of the present research confirmed that locus of failure interacts with the supplier joint recovery efforts to impact the post-failure relationship quality. Another interesting finding is the customer perception of relationship quality impacts their intention for future co-creation of activities.

From a theoretical perspective, our research findings intend to advance the existing knowledge of agronomy industry research and the recovery management disciplines. In particular, the insights gained from this research offer four fundamental contributions to academic research associated with B2B recovery and agronomy industry literature.

First, it sheds more light on the concept of joint recovery management in the context of the agronomy machinery and services market. Existing research on co-creation of recovery mainly focused on the consumer market or other industries. Despite the sensitivity of the agronomy industry and farm operations, there remains a paucity of evidence on joint recovery management represents a significant gap in contemporary agronomy literature, and the current research represents one of the first studies on joint recovery for this context. In particular, the findings reported here focused on the condition in which the co-creation of recovery improves the relationship quality, which contributes to customers' intention for future co-creation of recovery. Therefore, our research establishes a base for future research to explore the infant domain of joint recovery management in the agronomy machinery and business markets in general.

Second, in this paper, we examined the moderation role of locus of failure on the customers' perception of the relationship's quality with the supplier in agronomy machinery industry. The present investigation responds to previous research, which has called for further research to identify the influential factors in the failure recovery (e.g., Döscher, 2013; Zhu & Zolkiewski, 2015). Therefore, the present study has gone some way towards enhancing our understanding of factors that might moderate the impact of different recovery strategies (non-co-creation vs co-creation) on the customers' perception of relationship quality.

Third, this research's findings contribute empirical evidence on the discussion about the impact of the customers' perception of relationship quality on the re-co-creation intention in recovery management in the agronomy machinery context. Therefore, the present thesis completes the previous research, which has suggested investigations on the relationship quality and customer engagement (Chathoth et al., 2016; Hollebeek, 2019). Based on these findings, the present study provides ground for further research on the role and the impact of collaborative activities in recovery management in agronomy research.

From a practical and managerial perspective, the insights derived from this study were supposed to contribute to the knowledge and practice in agronomy machinery and services industry. The findings of this study are helpful for the development of knowledge and skills of suppliers and their employees who intend to engage their customers in the failure recovery activities in the context of B2B, particularly in the agronomy machinery and services industry. The high interaction between suppliers and customers

in this industry can be used as an important tool to develop joint activities and create superior values. However, based on our findings, we propose that the value driven from the collaborative recovery management might not always be greater than the customer sacrifices (the investment of the resources) customers make, and as a result, positive relational outcomes might not always be expected. Although the feedback and rapport of suppliers play a key role in success of recovery activities in this industry, finding a solution with customer help might not increase the perceived value when the failure is on the supplier side. This research has identified that joint recovery management's effectiveness on the relationship quality varies depending on the locus of failure. This finding enables the supplier of machinery and services to understand how and to what extend the co-creation of recovery can be conducted in different failure situations to increase customer satisfaction, trust and commitment after the failure situation.

Besides, this study's findings can assist the relevant decision-makers within the supplier and customer firm in this industry about the right timing of joint recovery activities. Therefore, managers in the machinery manufacturer and service provider firm can distinguish when the co-creation and customer engagement strategies are beneficial in the failure situation and lead to a higher perception of customer relationship quality. This finding can help agronomy machinery manufacturers with improving their failure recovery systems. Although the notification, feedback, and rapport of supplier employee are essential in the industries in which the high interaction between supplier and customer is required, our empirical results show that the co-creation of recovery should only be done with caution to enhance the relationship quality when the failure is not from the supplier.

On the other hand, if the failure happens on the customer side, supplier engagement in problem-solving significantly increases the relationship quality. Therefore, the supplier should be encouraged to contribute to the failure resolution where it is possible to strengthen the relationship quality with the customer and make a higher perception of trust, commitment, and satisfaction in the customer. The joint recovery activities also can be recommended when the failure is caused by an environmental factor. When the customers have greater role clarity, require more cognitive control and feedback of recovery activities. Then customers more likely to show a greater perception of relationship quality with the joint recovery activities. For machinery suppliers and service providers in this industry, these collaborative recovery activities with the customers might be a great opportunity to open venues for building a strong relationship. More specifically, this study's results disclosed that higher satisfaction commitment and trust might increase the customers' intention for future co-creation after the recovery. Therefore, the manufacturers and service providers in the agronomy industry can take this opportunity to utilize customer resources in future recovery activities. Suppliers may use this finding for workshops and training sessions to illustrate, develop and optimize the inter-organizational process to handle the joint recovery management in agronomy machinery and services markets effectively.

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