Customer Value Co-Creation in the Automobile Industry: Antecedents, Satisfaction, and Moderation

Christian Narh Opata1,2, Wen Xiao1,3, Angela Abena Nusenu1,6, Stephen Tetteh4,6, and Tettey-Wayo John Narh2

Abstract
The buying of cars is an important decision that customers make. Consequently, customers in their attempt in ensuring that they get a good deal go a great length in providing their skills, knowledge, and ideas to effect the design and specifications of their purchase. In this context, the purpose of this article is to first, measure two antecedents of customer participation in value co-creation in terms of customer willingness and customer ability; second, to measure how co-creation translates into customer satisfaction; and finally to examine the moderating effect of both price fairness perception and service convenience on satisfaction. With this objective, empirical data were collected through the administration of questionnaires to customers of automobile buyers in 30 dealer shops in Ghana. The proposed hypotheses were tested using SmartPLS 3.2.6 to perform structural equation modeling. The results showed that the two antecedents (willingness and ability) positively influences co-creation; co-creation significantly influences customer satisfaction; price fairness perception and service convenience not only influences satisfaction but they both have a positive moderation. The direct results between willingness, ability, and satisfaction also indicated positive relationship. Theoretical contributions, managerial implications, and suggestions for future research were discussed.

Keywords
automobile industry, value co-creation, satisfaction, price fairness, service convenience

Introduction
In recent times, the internet has not only affected on business models and how businesses are conducted world over, but has also made it possible for customers to gain access to certain information and markets that hitherto were not possible (Apavaloae, 2014). As a result, customers have been empowered to play significant roles in creating value than previously when they were only seen as value destroyers through the sharing of knowledge and other operant resources (Galvagno & Dalli, 2014; Järvi et al., 2018; Vargo & Lusch, 2016). Value co-creation requires that all actors are active during the collaboration process, be it the firm and suppliers, the firm and customers, or the firm and other interested stakeholders. The value co-creation concept draws a lot of inspiration from the open innovation concept where the firm seek for ideas from its stakeholders (Martinez, 2014).

The dealerships of automotive cars are also not spared of the influence of the internet on their businesses. Car buyers are now in a better position than ever before as they gain access to inventory and compare prices of cars through information provided by car auto sellers online (PwC, 2013). This has made it difficult for dealer shops in Ghana to remain competitive as customers can order cars in Europe or America and have it delivered to them in Ghana. This has pushed car dealers to look for innovate ways to remain competitive and as a result collaborate with their customers in creating value, and also offering after-sales services which hitherto were not common. Examples of co-creation in the automotive industry already exist (companies such as General Motors, Local Motors, Volkswagen, and Fiat) whereby customers actually play a key role in creating their cars (PwC, 2013).

1School of Management and Economics, University of Electronic Science and Technology of China, Chengdu, China
2School of Business, Kumasi Technical University, Kumasi, Ghana
3Centre for West African Studies, University of Electronic Science and Technology of China
4School of Management, Hefei University of Technology, China

Corresponding Author:
Christian Narh Opata, School of Business, Kumasi Technical University, Kumasi, Ghana.
Email: chrisrui@yahoo.com

Creative Commons CC BY: This article is distributed under the terms of the Creative Commons Attribution 4.0 License (https://creativecommons.org/licenses/by/4.0/) which permits any use, reproduction and distribution of the work without further permission provided the original work is attributed as specified on the SAGE and Open Access pages (https://us.sagepub.com/en-us/nam/open-access-at-sage).
Notwithstanding the vital role of individual customers in co-creation, substantial number of studies have concentrated on value after it was created, and thin attention has been given to practical identification of the precursors of value co-creation (Murthy et al., 2016). Among this few studies, Thomas (2018) investigated antecedents of co-creation in sports using football fans of European leagues. Yang et al. (2017) investigated the importance of customer participation in the real estate sector. Valjakka et al. (2013) assessed co-creation in b2b networks and effects of business models on value creation. Dey et al. (2016) investigated co-creation at the bottom of the pyramid by analyzing Bangladeshi farmers’ use of mobile telephony. The above examples have given us a broader picture of co-creation in different countries and industries, and as such, findings from these countries and industries may require fine-tuning in other countries and industries. The present research aims to achieve the following: first, to find how the antecedents of co-creation in terms of customers’ willingness and customers’ ability influence customer collaboration leading to co-creation of value. Co-creation is a voluntary activity as it depends greatly on willingness and ability of both the firm and customers.

Second, the study aims to measure how customer value co-creation translates into customer satisfaction. Finally, to measure (a) the moderating effect of price fairness perception on the relationship between co-creation and satisfaction, and (b) the moderating effect of service convenience on the relationship between co-creation and customer satisfaction. These two moderators, monetary and non-monetary, are both crucial in influencing customer satisfaction. Service convenience is key in reducing customers’ non-monetary cost such as time, effort, and energy (Thuy, 2011). On the contrary, price fairness becomes a big deal when the price of cars are extremely high (Herrmann et al., 2007). Herrmann et al. (2007) in their article found evidence that price plays a major role when customers wants to buy cars. Although there is glowing evidence to show that there is a significant relationship between customer satisfaction and these two moderators, there remains a gap as to how the moderators moderate the relationship between co-creation and customer satisfaction in a value co-creation context.

To investigate the above objectives, the Theory of Planned Behavior (TPB) and Service Dominant Logic (SDL) were used as the core theoretical concepts for this research. The use of TPB is considered appropriate for varied reasons: First, this theory is applicable to the value co-creation concept as it specifically delves into the motives behind people’s behavior. In this article, willingness of customers is used as an antecedent to look at customers’ intention to participate in value co-creation with the firm. Second, TPB is helpful in examining core competencies, which are knowledge and skills (operant resources) and according to the SDL, necessary for customer participation in value co-creation. The use of customers’ ability as an immediate antecedent to value co-creation reflects how customers’ skills and knowledge influence their co-creation intention. SDL, on the contrary, focuses on the customer as the center or the engineer of innovation through co-creation and that the customer co-creates value (Vargo & Lusch, 2016). The process of exchange which underlines the SDL is given much emphasis other than the “goods” exchange. As a result, companies have placed much emphasis on the significance of the interaction in the process of co-creating value (Merz et al., 2018).

The subsequent sections of the article are organized as follows: The “Literature Review and Hypotheses Development” section looks at relevant literature relating to the topic and subsequently the development of the hypotheses to justify the proposed model. In the “Method” section, the methodology of the study was discussed, while the “Results” section presents the results obtained from the study. Discussion of the results and conclusions drawn were present in the section “Discussion and Conclusion” of the article.

**Literature Review and Hypotheses Development**

**Value Co-Creation**

Customer value co-creation shows how customers spend time, effort, and other resources to share information, ideas, and suggestions, and involve in making decisions during the service production and delivery process (Durugbo & Pawar, 2014; Yi & Gong, 2013). Vargo and Lusch (2016) postulates that value co-creation occurs through the interactions of the actors by way of sharing and using resources. In this regard, customers are playing significant roles in the creation of value and are thus active participants as seen in the SDL. Firms are able to come out with new innovations through collaboration with their customers. The interchange of ideas, opinions, skills, and knowledge with lots of actors and the customer playing a crucial role through information exchange underline the concept of value co-creation (Chen & Wang, 2016). Merz et al. (2018) emphasized that the customer plays the role of sharing knowledge and information actively. Prahalad and Ramaswamy (2000) postulated that the firm is not only using customers’ competence but also putting them to work. We echoed in this article that co-creation is a volition activity and made possible through the interaction between the firm and all stakeholders.

Many factors are likely to affect customers’ readiness to take part in value co-creation (Baumann & Meunier-Fitzhugh, 2014; Hsiao et al., 2015; Opata et al., 2019; Palma & Hong, 2014; Sugathan et al., 2017). In this study, we look at two antecedents of value co-creation, that is, customers’ willingness and customers’ ability. As echoed by Vargo and Lusch (2016), that the customer can be classified as an operant resource who exchanges knowledge and skills, it is significant to explore how customers’ willingness and ability relate to co-creation. As echoed by Opata et al. (2019), “for any effective interaction leading to a possible co-creation,
both actors must be motivated enough and must also have the necessary skill and knowledge as co-creation is more of exchange of knowledge and information.” Fu et al. (2018) showed that both extrinsic and intrinsic motivations affect customers’ readiness to take part in co-creating value. In this article, varied needs of customers’ motivation is used to access customers’ willingness to co-create value.

Based on the SDL where the value co-creation concept is largely centered on the exchange of operant resources which includes skills and knowledge between actors, and objectives of the study, the conceptual framework (Figure 1) was designed to reflect the antecedents of customers’ value co-creation, and also value co-creation outcome with respect to customer satisfaction, with price fairness and service convenience both used as moderators. We demonstrated that ability and willingness are two most important ingredients necessary for a successful collaboration between the dealership and customers in the Ghana automobile industry.

Customers’ Willingness

Lazarus et al. (2014) opined that willingness to co-create value varies with respect to service type. Füller (2010) postulates that there are varied reasons that can be attributed to customers taking part in co-creation of value. He argued that most of these reasons are due to customers’ motivational needs which are both intrinsic and extrinsic. Accordingly, Zhao et al. (2017) revealed in their paper that there are other factors that may influence willingness. These factors relate to subject, environment, brand, as well as the perceived value. Chen and Wang (2016) found evidence that both customers’ intrinsic and extrinsic motivators are crucial in affecting customers’ value co-creation drive. We argued in this article that because the purchase of automobile is an important choice that they have to make, customers will be willing to co-create with the firm by offering suggestions and ideas. We find evidence from Lazarus et al. (2014) and Opata et al. (2019) that customer willingness affects significantly the extent of co-creation. Neghina et al. (2017) concluded that irrespective of the service type, willingness to co-create is an immediate antecedent to co-creation activities. Following these arguments, we propose the following:

**Hypothesis 1:** Customers’ willingness positively influences customers’ participation in value co-creation.

Customers’ Ability

Ability can be looked at as a skill or knowledge in a specified field or area which can be technical or about a market (Guenzi & Georges, 2010). Customers’ ability refers to customers’ owned resources, including customers’ knowledge, skills, creativity, and network assets. It is customers’ resource contribution to a firm’s co-creation activity voluntarily. Information, knowledge, skills, and other intangible resources affect customers’ ability to co-create value (Cui & Wu, 2016; Dong et al., 2015; Durugbo & Pawar, 2014). Customers’ unbelief that they are capable to perform a task limits their participation behavior, even if they know for sure that it is a better alternative (Eisingerich et al., 2013). Customer’s ability to participate in co-creation can be greatly influenced by their knowledge and skills. Extant literature shows that knowledge is influenced by one’s information about a product or service. This information can be sourced from past experiences or purchases, friends, the firm, or available products. Skills are one’s ability to perform a task well and it emanates, for example, from one’s knowledge and repeated practice. Customers’ might have the knowledge about a product or service but can lack the needed skill to be able to make their knowledge count in the collaboration process. Hoegl et al. (2003) in their article “Team-Level Antecedents of Individual’s Knowledge Networks” posited that individuals in a team network will have to answer questions with respect to their skills or knowledge which might influence their co-creation drive. Grönroos (2008) concluded that for an effective and efficient integration of operant resources, customers must have both the knowledge and skills. Hibbert et al. (2012) revealed that ability has significant effect on customers’ participation in co-creation. Zhang et al. (2016) and Dong et al. (2015) find evidence in their article that consumers’ competence and skills are key factors influencing consumers’ ability to engage in a collaborative process leading to co-creation. In this regard, we propose the following hypotheses:

**Hypothesis 2:** Customers’ ability positively influences their participation in value co-creation.

**Hypothesis 3:** Customers’ ability positively influences customers’ willingness to take part in value co-creation.

Customer Satisfaction

Customer satisfaction plays a crucial role for marketing and commercial activities. The confirmation–disconfirmation...
theory has been used as the core theoretical basis for understanding customer satisfaction. Customers’ perception of the performance of a product and their earlier expectations characterize customer satisfaction (Oliver, 1980). If the performance of a service or product meets or exceeds the expectations of customers, customers are happy, and the opposite results in dissatisfaction. According to Fournier and Mick (1999), satisfaction emanates from two sources, which are, the total feelings customers get from a perceived value and the experience customers get through ongoing consumption of a product. Extant literature has shown that customer co-creation is related to customer satisfaction (Heidenreich et al., 2015; Hunt et al., 2012; Oliva et al., 1992). Consequently, firms have made frantic efforts aimed at increasing customer satisfaction. The co-creation of value concept implies that there is high customer involvement by way of exchange of information and other operant resources. This has the tendency of influencing customer satisfaction. As echoed by Muniz and O’Guinn (2001), customer satisfaction is mostly influenced by customers’ involvement in the service production and delivery process. Hunt et al. (2012) postulates that community benefits and self-effect bias are the two sources of satisfaction that results out of value co-creation. Frempong et al. (2018) find evidence that value co-creation is an immediate antecedent to satisfaction.

**Hypothesis 4:** Value co-creation is positively related to customer satisfaction.

**Price Fairness Perception**

Prior studies on the impact of customer value co-creation and customer satisfaction have shown that customer participation in value co-creation positively relates to customer satisfaction (Hunt et al., 2012). However, not much research has been carried on the effect of price fairness perceptions on customer satisfaction in the perspective of value co-creation. Konuk (2018) opined in his article that price is an immediate antecedent to customer satisfaction. In the setting of this study, we used the definition of price fairness provided by Xia et al. (2004). Price fairness perception is used in this research to moderate the relationship between value co-creation and satisfaction. Studies by Konuk (2018) found evidence that price perceptions relate positively to satisfaction. Customers’ perception that they might have paid more than necessary for a product or service heightens issues of price fairness. Also customer suspicion that other customers paid less influences the issue of price fairness perception. We argued in this article that high price fairness perception will strengthen the positive relationship between co-creation and satisfaction, and the opposite can be true for price unfairness. Konuk (2018) with evidence concluded in their article that price perceptions influence satisfaction. Price unfairness affects satisfaction negatively (Fernandes & Calamote, 2016). Thus, we propose the following hypotheses:

**Hypothesis 5:** Price fairness perceptions relates positively to customer satisfaction.

**Hypothesis 6:** Price fairness moderates the relationship between co-creation and satisfaction.

**Service Convenience**

Service Convenience according to Berry et al. (2002) is customers’ perception of the degree of time and energy with respect to buying and consuming a service. As noted by Berry et al. (2002), the time that customers spend on waiting is an opportunity cost which has the tendency of limiting customers’ future participation as well as the service outcome. Colwell et al. (2008) outlined five multi-dimensional constructs associated with service convenience, which are, decision convenience, access convenience, transaction convenience, benefit convenience, and finally, post-benefit convenience. Service convenience, although non-monetary, has become increasingly important as it offers competitive advantage in markets that have similar service appeals especially in the automobile industry in Ghana. Previous studies have shown that service convenience affects satisfaction (Thuy, 2011). Hsu et al. (2010) noted that increase in service convenience influences or increases customers’ value-in-use. In addition, low convenience implies that customers’ service outcome in terms of satisfaction is greatly affected. Kaura et al. (2014) noted that service convenience largely influences customer satisfaction. We argue in this article that customers’ convenience which is largely related to customers’ time and effort in making a purchase influences their satisfaction. Car buys would factor in the time spent in searching and making final purchase decision. Consequently, service with a high customer convenience has the propensity of strengthening the positive correlation between the two variables, co-creation and satisfaction. Conversely, the relationship between co-creation and satisfaction will be dampened when customer perceive a low service convenience. Accordingly, we suggest the following hypotheses:

**Hypothesis 7:** Service convenience relates positively to customer satisfaction.

**Hypothesis 8:** Service convenience moderates the relationship between customer co-creation and customer satisfaction.

**Method**

**Sample and Data Collection**

The study’s respondents were automobile customers from Accra and Kumasi, two major cities in Ghana. Basically, these two cities were selected because apart from the fact they have the greater amount of dealer shops for automobiles, they also contain the highest units of automobile users in the country (Baskin, 2018). By means of random
sampling, 350 respondents were selected from each city between January and June 2018. Respectively, 18 and 12 dealer shops were visited in Accra and Kumasi. The authors self-administered questionnaires to respondents during a face-to-face interaction at the dealer shops. As participation was voluntary, questionnaires were not given to customers who were disinterested in the survey. In all, 700 questionnaires were distributed out of which 620 were returned. This gave a response rate of 88.57%. Using Excel 2016 and SPSS 23, data screening was done to check for missing values, incomplete responses, and response bias. The final work utilized 532 samples out of which 68% were males. The detailed respondents’ demography is depicted in Table 1.

**Measures**

The scales were structured based on existing measures. However, we made minor modifications so as to fit the present study. The study employed a 7-point Likert-type scale that stretches from strongly agree (7) to strongly disagree (1). Four items which centered on compensation, showing of ideas, intrinsic motives, and gaining knowledge were adopted from Opata et al. (2019) to measure customer willingness to participate in value co-creation. We used the items used by Eisingerich et al. (2013) to measure customers’ ability to collaborate in co-creation of value. To measure value co-creation, all the items were adapted from Opata et al. (2019). On consumers’ co-creation outcomes, specifically customer satisfaction, four items that measure customers’ satisfaction were adapted from Herrmann et al. (2007) and Konuk (2018). The study adapted items from Herrmann et al. (2007) and Konuk (2018) to measure price fairness. Four items measuring service convenience were adopted from Thuy (2011). In making sure that the measuring items are easy to understand, the study utilized the inputs of industry experts in Ghana, and also Ghanaian PhD candidates studying in China and in Ghana. The inputs of experts and the PhD candidates helped greatly in developing the measurement items for the study. In all, six constructs were used for the study: two antecedents—willingness and ability; two outcome variables—co-creation and satisfaction; and two moderating variables—price fairness perception and service convenience.

**Data Analysis**

SmartPLS 3.2.6 was used to perform structural equation modeling (SEM) to analyze the data. A two-stage procedure was carried out in analyzing the data. First, the measurement model was first examined by checking the validity and reliability of the measures and also for checking discriminant validity. Second, the structural model was examined to check the path coefficients. In using SmartPLS, we satisfy the condition that the data violated normality as some of the values for skewness and kurtosis all exceeded the recommended values (Kline, 2011). Following the suggestions of Podsakoff et al. (2003), the study assessed common method variance. The study also utilized Collinearity VIF (variance inflation factor) to assess common method bias in SmartPLS. The assumptions of common method bias were not violated as suggested by Podsakoff et al. (2003). The Pearson correlation coefficient magnitudes all fall withing the acceptable range and that the variables are not highly correlated. This means that regression estimates of the study are reliable. However, the demographical factors (sex, age, education, driving experience) were all insignificant and consequently no further analysis was done on them.

**Results**

**Measurement Model**

To evaluate the reliability and the validity of the measurement model, Cronbach’s alpha, the composite reliability (CR), average variance extracted (AVE), and the factor loadings were assessed. The values for Cronbach’s alpha of the constructs exceeded the suggested value of .7. This shows that there is a high internal consistency among the measures. Hair et al. (2013) suggested that in achieving the reliability of the measurement model, the AVE should be greater than 0.5 and the CR greater than .7. The values as shown in Table 2 indicates that the values obtained exceeds the recommended values (Hair et al., 2013). Following the recommendations of Hair et al. (2013), discriminant validity was examined. Discriminant validity shows that (a) the constructs were measuring the same things and (b) there is no relationship between the measures. One of the benefits of discriminant

**Table 1. Respondents’ Demography.**

| Gender   | Number and percentage of respondents |
|----------|-------------------------------------|
| Male     | 362 (68%)                           |
| Female   | 170 (32%)                           |
| Age      |                                     |
| 18–29    | 120 (22.60%)                        |
| 30–39    | 187 (35.10%)                        |
| 40–49    | 140 (26.30%)                        |
| 50–59    | 64 (12.10%)                         |
| 60 and above | 21 (3.90%)                  |
| Education|                                     |
| Postgraduate | 174 (32.80%)          |
| Degree/HND | 244 (45.9%)                   |
| High school | 87 (16.3%)                |
| Below high school | 27 (5%)       |
| Driving experience|                                         |
| Below 1 year | 18 (3.38%)                   |
| 1–5 years  | 64 (12%)                           |
| 6–10 years | 179 (33.64%)                      |
| 11–15 years| 146 (27.49%)                      |
| 16–20 years| 109 (20.49%)                      |
| Above 20 years| 16 (3%)                     |

Note. HND = Higher National Diploma.
| Constructs                | Measurement items                                                                 | Loadings | Cronbach’s α | AVE  | CR  |
|--------------------------|------------------------------------------------------------------------------------|----------|--------------|------|-----|
| Customer willingness     | I will collaborate with the dealership to enhance my overall experience.            | 0.900    | .914         | 0.796| .940|
|                          | I will collaborate with the dealership for enjoyment and entertainment.             | 0.902    |              |      |     |
|                          | I will collaborate with the dealership to get more insight into automobiles.       | 0.880    |              |      |     |
|                          | I will collaborate with the dealership to get rewards.                             | 0.887    |              |      |     |
| Customer ability         | I possess good knowledge of automobiles.                                           | 0.912    | .890         | 0.752| .924|
|                          | My past experiences increases my confidence.                                       | 0.901    |              |      |     |
|                          | I know the specifications of the car I want.                                       | 0.849    |              |      |     |
|                          | I am able to express my ideas to employees of the company.                         | 0.803    |              |      |     |
| Customer co-creation     | I spend a lot of time sharing information about my needs and opinions with the staff of the dealership. | 0.849    | .897         | 0.710| .924|
|                          | I put a lot of effort into expressing my personal needs to the staff during the service process. | 0.833    |              |      |     |
|                          | I always provide suggestions to the staff for improving the product/service outcome.| 0.849    |              |      |     |
|                          | I have a high level of participation in the service process.                       | 0.850    |              |      |     |
|                          | I am very much involved in deciding how the service should be provided.            | 0.783    |              |      |     |
| Price fairness perception| The dealer’s pricing decision processes and procedures were reasonable, fair, and acceptable. | 0.927    | .924         | 0.868| .952|
|                          | All customers are treated equally by the dealer’s pricing policy.                  | 0.926    |              |      |     |
|                          | The price charged by the dealer is relatively fair as compared with other prices of same car by other dealers. | 0.942    |              |      |     |
| Customer satisfaction    | Overall, I am pleased with the products and services offered by the dealership.   | 0.951    | .970         | 0.917| .978|
|                          | The product and services offered by the dealership meet my expectations as a customer. | 0.957    |              |      |     |
|                          | I think I did the right thing when I got in touch with the dealership for their product/service. | 0.965    |              |      |     |
|                          | The dealership is a good automobile company to do business with.                   | 0.958    |              |      |     |
| Service convenience      | The information needed in deciding which dealership to go was easy                | 0.907    | .868         | 0.910| .791|
|                          | The dealership is easily accessible in a timely manner                             | 0.872    |              |      |     |
|                          | Purchase and final payment was done with ease                                      | 0.890    |              |      |     |
|                          | The automobile is easy to use                                                      | 0.852    |              |      |     |

Note. AVE = average variance extracted; CR = composite reliability.
validity is that, it ensures that the construct measurement is unique (Hair et al., 2013). The values for discriminant validity, as shown in Table 3, shows that the values obtained met the suggestions of Hair et al. (2013).

Henseler et al. (2015) criticized the Fornell and Larcker (1981) criteria for not being able to accurately check for discriminant validity and hence proposed that heterotrait–monotrait (HTMT) be used. According to Henseler et al. (2015), if the values obtained for discriminant validity are closer to 1, it means there is problem. Kline (2011) suggested an acceptable value of not greater than .85. Teo et al. (2008) suggested a more liberal threshold value of not more than .90. The HTMT values as shown in Table 4 indicate that the HTMT values all fall within .85 and .90 as recommended.

### Structural Model

Hair et al. (2013) suggested a bootstrap with 5,000 samples be performed to evaluate the structural model. Following the suggestions of Cohen (1988), the $R^2$, beta, and the $t$ values were assessed. The values for $R^2$ exceeding .26 shows a good model. The $R^2$ values obtained all fall within the acceptable values: Customer willingness = .484; Customer value co-creation = .626; Customer satisfaction = .723.

The structural model shows the path values of the inner model as shown in Figure 2. The results show that customer willingness positively and significantly influences customer value co-creation ($\beta = .462; p < .001$) supporting Hypothesis 1. Customer ability also significantly and positively influences customer participation in value co-creation ($\beta = .398; p < .001$) giving credence to Hypothesis 2. Customer ability influences customer willingness to co-creation ($\beta = .696; p < .001$). Customer involvement in co-creating value positively and significantly influences customer satisfaction at $\beta = .398; p < .001$. In addition, the results demonstrate that price fairness perception does influence customer satisfaction at $\beta = .334; p < .001$. The result for the direct effect of service convenience on satisfaction is significant at $\beta = .199; p < .001$. The results for the direct relationship between (a) customer willingness and customer satisfaction and (b) customer ability and customer satisfaction indicate that both customer willingness and customer ability significantly affects customer satisfaction at $\beta = .242; p < .001$, and at $\beta = .377; p < .001$, respectively.

### Moderating Analysis

This study hypothesized that (a) price fairness perception would have a moderating effect on the variables customer value co-creation and customer satisfaction and (b) service convenience would moderate on customer co-creation and customer satisfaction. Following the suggestion of Henseler et al. (2015), the study used PLS product indicator to perform the moderating analysis moderating effect with 5,000 bootstrap samples. To measure the moderating effect, an interaction construct was used in SmartPLS. This was done by multiplying the moderating variable and value co-creation to create the interaction construct. Table 5 shows the path coefficients of the moderating results. It indicates a significant moderating effect of price fairness at $\beta = .239; p < .001$. Thus, Hypotheses 6 is supported that price fairness perception moderates the variables co-creation of value and customer satisfaction when customers perceive high price fairness. The results further show that service convenience reinforces the positive correlation between co-creation and satisfaction at $\beta = .135; p < .001$, and thus Hypothesis 8 is supported.

### Discussion and Conclusion

The study evaluated the relationship between antecedents of co-creation (willingness and ability) and how co-creation translates into customer satisfaction. The study also
evaluates the role of both price fairness and service convenience. The findings of this study are illustrated below.

First, regarding Hypothesis 1 that “customers’ willingness is positively related to co-creation,” our findings suggest that customer willingness in terms of their motivation is an essential element needed for customers to participate in value co-creation. Value co-creation is a social activity and as such, for customers to take part, customers must be willing (motivated enough). Studies by Lazarus et al. (2014) opines that customers’ willingness is mostly influenced by their motivation. Companies must give attention to customers’ motivational needs so as to increase their willingness to share their ideas, skills, and information in a co-creation activity. Also, the results of Hypotheses 2 and 3, that “customers’ ability is positively related to co-creation” and “customers’ ability influence customers’ willingness to be involved in co-creation,” respectively, suggest that customers’ ability affects value co-creation and also influences customers’ willingness to participate in co-creation. These findings concur with the conclusion of earlier studies (Bettiga et al., 2018; Dong et al., 2015) that knowledgeable customers have greater willingness to participate in value co-creation. This shows that customers of automobile companies might not have absolute knowledge in cars; however, basic knowledge in terms of performance of cars, fuel consumption among others, may be known to them and can influence their co-creation with the firm. Companies must look at creating a common platform whereby they empower their customers by way of training to gain knowledge and skills so as to contribute effectively in co-creation.

Second, our findings provide a theoretical expansion on how co-creation influences customer satisfaction by confirming prior studies carried out by Frempong et al. (2018). Their study revealed co-creating of value does affect positively customer satisfaction. The high level of customer participation in the process of co-creating value affects customer satisfaction or dissatisfaction. We again check for the direct effect of (a) customer willingness and customer satisfaction and (b) customer ability and customer satisfaction although not hypothesized. The results as shown in Table 5 indicates that both customer willingness and customer ability significantly influence customer satisfaction. Customers’ ability in terms of their skill and knowledge as well as their motivation resulting in their willingness to co-create significantly influences customer satisfaction. Consequently, firms should encourage their customers to share knowledge, ideas, and information as this will go a long way to affect their satisfaction.

Third, the study contributes to the existing literature by examining the moderating effect of price fairness perception. There is a lacuna in literature as to the role played by price fairness perception on customer satisfaction in the context of value co-creation. The findings of this study show that price fairness perception first affects positively customer satisfaction, and second price fairness moderates the positive relationship between co-creation and satisfaction. The purchase of an automobile is a key decision that customers have to make. Consequently, price becomes the yardstick that customers use to measure satisfaction. These means that organizations should be fair to their customers as far as pricing is concerned.

Fourth, the study provided a debate on the influence of non-monetary cost, service convenience, on customer satisfaction in the context of co-creation. Although the results show that both the monetary cost (price fairness perception) and the non-monetary cost (service convenience) influence satisfaction in the perspective of co-creation, the influence of price fairness is much higher ($\beta = .239$) than the influence of service convenience ($\beta = .135$). This implies that automobile customers in Ghana are ready to sacrifice their convenience to get a good deal for their purchase. This reinforces the importance of the price fairness to the average Ghanaian customer.

Furthermore, the study’s findings have consequences for automobile industry not only in Ghana but also the entire West Africa region and beyond. To the best knowledge of the authors, the current study represents one of the first to investigate value co-creation in Ghana automobile industry that considered antecedents, customer satisfaction, and the role of service convenience (non-monetary) and price fairness (monetary). Our results indicate that to remain in business, companies can improve customers’ willingness and ability by sharing knowledge, ideas, and information about past, present, and future developments in the automobile industry. This will enable companies to update customers on new

### Table 5. Path Analysis.

| Paths                                                                 | Hypotheses | Path coefficient | t value | p value | Result |
|----------------------------------------------------------------------|------------|------------------|---------|---------|--------|
| Customer willingness → co-creation                                   | H1         | 0.462            | 13.790  | ***     | Support|
| Customer ability → co-creation                                       | H2         | 0.398            | 10.795  | ***     | Support|
| Customer ability → customer willingness                              | H3         | 0.696            | 19.745  | ***     | Support|
| Co-creation → customer satisfaction                                  | H4         | 0.525            | 13.550  | ***     | Support|
| Price fairness perception → customer satisfaction                    | H5         | 0.334            | 8.703   | ***     | Support|
| Co-Creation × Price Fairness → customer satisfaction                | H6         | 0.239            | 16.821  | ***     | Support|
| Service convenience → customer satisfaction                          | H7         | 0.199            | 5.247   | ***     | Support|
| Co-Creation × Service Convenience → customer satisfaction           | H8         | 0.135            | 7.380   | ***     | Support|

$\text{Path Analysis.}$
features in their preference of cars and alternative car brands that may not be well-known to them.

Second, this study affords dealers the need to be extra careful with their customers’ as far as pricing and the convenience of their customers are concerned as these two have been identified in this article to influence satisfaction. Price fairness is crucial especially in developing countries. This is because in a developing economy, incomes are low and as such, customers are much concerned about how much they spend and the benefit they get from the product or service. Price fairness, although is both biased and subjective, its outcome does not benefit companies if the customer feels cheated. Customers may withdraw from the deal, pass on unpleasant information to friends and acquaintances solely aim at tarnishing the company’s image. Dealer shops must devise means to limit this perception by having an engagement with the customer continuously. Although customers actively participate in co-creation through sharing of ideas and information, the possibility of price unfairness is present. Consequently, customers who feel short-changed will be dissatisfied.

Just like other studies, the study is subjected to some limitations. First, the present study only looked at ability and willingness as two factors influencing customers’ participation in value creation. There are other factors that affect customers’ participation in value co-creation such as customer empowerment, suitable platform, firm’s brand value, interest in the activity, and so on. Future research should be interested in exploring the other factors affecting both customers and the firm participation. Second, this study only looked at how co-creation translates into customer satisfaction in the automobile industry and overlooked how this satisfaction will result in brand loyalty in the automobile industry. Future research can explore co-creation outcomes in other sectors of the Ghanaian economy.

Declaration of Conflicting Interests
The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding
The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: We would like to acknowledge the financial support by the Research Project (No: 16YJA630057) of Ministry of Education of China.

ORCID iDs
Christian Narh Opata https://orcid.org/0000-0002-7133-576X
Angela Abena Nusenu https://orcid.org/0000-0003-2918-6622
Stephen Tetteh https://orcid.org/0000-0002-6195-0240

References
Apavaloaie, E.-I. (2014). The impact of the Internet on the business environment. Procedia Economics and Finance, 15, 951–958.

Baskin, A. (2018). Africa used vehicle report. https://wedocs.unep.org/bitstream/handle/20.500.11822/25233/AfricaUsedVehicleReport.pdf

Baumann, J., & Meunier-Fitzhugh, K. Le. (2014). Trust as a facilitator of co-creation in customer-salesperson interaction—An imperative for the realization of episodic and relational value? AMS Review, 4, 5–20. https://doi.org/10.1007/s13162-013-0039-8

Berry, L. L., Seiders, K., & Grewal, D. (2002). Understanding service convenience. Journal of Marketing, 66(3), 1–17.

Bettiga, D., Lamberti, L., & Noci, G. (2018). Investigating social motivations, opportunity and ability to participate in communities of virtual co-creation. International Journal of Consumer Studies, 42(1), 155–163. https://doi.org/10.1111/ijcs.12409

Chen, C. F., & Wang, J. P. (2016). Customer participation, value co-creation and customer loyalty—A case of airline online check-in system. Computers in Human Behavior, 62, 346–352. https://doi.org/10.1016/j.chb.2016.04.010

Cohen, J. (1988). Statistical power analysis for the behavioral sciences (2nd ed.). Lawrence Erlbaum.

Colwell, S. R., Aung, M., Kanetkar, V., & Holden, A. L. (2008). Toward a measure of service convenience: Multiple-item scale development and empirical test. Journal of Service Marketing, 22(2), 160–169.

Cui, A. S., & Wu, F. (2016). Utilizing customer knowledge in innovation: Antecedents and impact of customer involvement on new product performance. Journal of the Academy of Marketing Science, 44(4), 516–538. https://doi.org/10.1007/s11747-015-0433-x

Dey, B. L., Pandit, A., Saren, M., Bhowmick, S., & Woodruffe-Burton, H. (2016). Co-creation of value at the bottom of the pyramid: Analysing Bangladeshi farmers’ use of mobile telephony. Journal of Retailing and Consumer Services, 29, 40–48.

Dong, B., Sivakumar, K. D., Evans, K., & Zou, S. (2015). Effect of customer participation on service outcomes: The moderating role of participation readiness. Journal of Service Research, 18(2), 160–176.

Durugo, C., & Pawar, K. (2014). A unified model of the co-creation process. Expert Systems With Applications, 41(9), 4373–4387. https://doi.org/10.1016/j.eswa.2014.01.007

Eisingerich, A. B., Auh, S., & Merlo, O. (2013). Acta non verba? The role of customer participation and word of mouth in the relationship between service firms’ customer satisfaction and sales performance. Journal of Service Research, 17(1), 40–53.

Fernandes, T., & Calamote, A. (2016). Unfairness in consumer services: Outcomes of differential treatment of new and existing clients. Journal of Retailing and Consumer Services, 28, 36–44.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error: Algebra and statistics. Journal of Marketing Research, 18(1), 39–50. https://doi.org/10.2307/3150980

Fournier, S., & Mick, D. (1999). Rediscovering satisfaction. Journal of Marketing, 63(4), 5–23.

Frempong, J., Junwu, C., & Enock, M. A. (2018). Effects of waste management customer online value co-creation on sanitation attitude and advocacy: A customer-enterprise dyadic perspective. Sustainability, 10(2557), 1–21.

Fu, J., Hsu, C. W., & Lu, I-W. (2018, June 26–30). Understanding why customers engage in co-creation behaviors—a psychological ownership perspective (p. 257) [Conference session].
Sugathan, P., Rakesh, K., & Mulky, A. G. (2017). A typical shifts post-failure: Influence of co-creation on attribution and future motivation to co-create. *Journal of Interactive Marketing, 38*, 64–81. https://doi.org/10.1016/j.intmar.2017.01.002

Teo, T. S. H., Srivastava, S. C., & Jiang, L. (2008). Trust and electronic government success: An empirical study. *Journal of Management Information Systems, 25*(3), 99–132.

Thomas, R. (2018). Mapping the perceptions and antecedents of football fans’ co-creation behaviours with sponsorship brands: A pan-cultural study of the European leagues. *Journal of Marketing Management, 34*, 1470–1502. https://doi.org/10.1080/0267257x.2018.1545685

Thuy, P. N. (2011). Using service convenience to reduce perceived cost. *Marketing Intelligence and Planning, 29*(5), 473–487. https://doi.org/10.1108/02634501111153683

Valjakka, T., Kansola, M., Hakanen, T., & Valkokari, K. (2013). Antecedents of value co-creation in B2B networks. *The Philosopher’s Stone for Sustainability*, 173–177. https://doi.org/10.1007/978-3-642-32847

Vargo, S. L., & Lusch, R. F. (2016). Institutions and axioms: An extension and update of service-dominant logic. *Journal of Academy of Marketing Science, 44*, 5–23. https://doi.org/10.1007/s11747-015-0456-3

Xia, L., Monroe, K. B., & Cox, J. L. (2004). The price is unfair! A conceptual framework of price fairness perceptions. *Journal of Marketing, 68*(4), 1–15.

Yang, A. J.-F., Huang, Y.-C., & Chen, Y. J. (2017). The importance of customer participation for high-contact services: Evidence from a real estate agency. *Total Quality & Business Excellence, 30*(7–8), 831–847.

Yi, Y., & Gong, T. (2013). Customer value co-creation behavior: Scale development and validation. *Journal of Business Research, 66*(9), 1279–1284. https://doi.org/10.1016/j.jbusres.2012.02.026

Zhang, M., Zhao, X., Voss, C., & Zhu, G. (2016). Innovating through services, co-creation and supplier integration: Cases from China. *International Journal of Production Economics, 171*, 289–300. https://doi.org/10.1016/j.ijpe.2015.09.026

Zhao, Y., Ci, Y., & Zhou, R. (2017). Factors influencing customers’ willingness to participate in virtual brand community’s value co-creation: The moderating effect of customer involvement. *Online Information Review, 43*(3), 440–461.