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Article

Social Networks Marketing, Value Co-Creation, and Consumer Purchase Behavior: Combining PLS-SEM and NCA

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Abstract: Given the mediating role of value co-creation, this paper tries to demonstrate how social network marketing (SNM) could influence consumer purchase behavior (CPB). The proposed hypotheses are empirically tested in this study using a PLS-SEM and Necessary Condition Analysis (NCA) method combination. The novel methodology adopted in this study includes the use of NCA, IPMA matrix, permutation test, CTA, and FIMIX. The assessment of the outer model, the inner model, the NCA matrix, and the IPMA matrix are the four steps that the paper takes. Instagram users with prior experience making purchases online made up the statistical population of the study. Four hundred twenty-seven questionnaires were analyzed by SmartPLS3 software. Based on the findings, SNM positively and significantly influenced economic, enjoyment, and relational values. Furthermore, these three types of values significantly and directly influenced CPB. For CPB, the model accounted for 73.8% of the variance. The model had high predictive power because it outperformed the PLS-SEM benchmark for all of the target construct's indicators in terms of root mean square error (RMSE). According to the NCA's findings, SNM, economic, recreational, and relational values are necessary conditions for CPB that are meaningful ($d \geq 0.1$) and significant ($p < 0.05$). Four prerequisites must be met for CPB to reach a 50% level: relational value at no less than 8.3%, enjoyment value at no less than 16.7%, economic value at no less than 33.3%, and SNM at no less than 31.1%. The highest importance score for SNM is shown to be 0.738, which means that if Instagram channels improve their SNM performance by one unit point, their overall SNM will also improve by 0.738.

Keywords: social media; social networks marketing; value co-creation; consumer purchase behavior; Instagram

1. Introduction

Marketing science has been witnessing significant changes because of the birth of social networks (Tang et al. 2019). Social networks have modified the rules of the game, and new formal and informal institutions have been presented. New threats and opportunities have been presented by the institutions to enhance marketing tools and inform, encourage, and persuade consumers to alter their purchase behavior (Ebrahimi et al. 2020; Salem and Salem 2021).

Recently, the business world has experienced the accelerated transition from brick-and-mortar to click-and-mortar business models due to technological trends, such as modern

digital technologies leading to modified CPB (Naresh and Reddy 2019). These changes have influenced the status of SNM as a novel, developing, important, and underexplored boundary, attracting the attention of marketing experts, researchers, practitioners, and policymakers.

Utilizing various social media platforms, users interact with ease in this technological environment (Alves et al. 2016). The platforms have also facilitated the exchange of information between them (Salamzadeh et al. 2019), and have decreased information asymmetry in several developing markets. In addition, time and location impose no limitations for firm-consumer interactions (Carr et al. 2015), and the communications in social networks are two-way communications that are done effectively and efficiently compared to traditional one-way communications (Farook and Abeysekara 2016). On the contrary, it is simple to use the features of social media platforms to facilitate the application of new means to achieve new goals (Gustafsson and Khan 2017). However, the widespread use of social media platforms has influenced the actions of consumers (Parker and Brennan 2020). Then, social networks marketing attracted the attention of experts interested in exploiting various opportunities and conducting research in this field (Sheth and Kellstadt 2021).

Furthermore, widespread social media use practically modified the SNM approach for firms trying to influence CPB (Akar and Dalgic 2018; Salamzadeh and Markovic 2018). Generally, individuals spending significant time on social media platforms are exposed to hundreds of advertisements and marketing campaigns (Zhu and Chen 2015; Harris et al. 2019). Consequently, for monetizing their investments, discovering, assessing, and exploiting such opportunities should be learnt by firms. Moreover, they must improve their knowledge of social media and SNM, and they should gather data on users' interactions on such media platforms and on how SNM could influence the meeting of their key performance indicators (KPIs) (Dwivedi et al. 2021).

It is believed that economic, enjoyment, and relational values are created through SNM methods by consumers' engagement with firms (Khajeheian and Ebrahimi 2021; Horn et al. 2015; Sheth 2018). Moreover, through SNM firms will be capable of laying the foundation for consumers to communicate their ideas, make recommendations, and contribute to value co-creation in those firms (Pitafi et al. 2020). Thus, consumers' contribution to firms' value creation processes is boosted, the chance of changing CPB is increased, and sales key performance indicators are enhanced (Keegan and Rowley 2017). Consequently, value co-creation may influence CPB.

So continuous advances in technology, linked to globalization, changes in buying habits, and consumers' revised behaviors, have made it more difficult for firms to differentiate themselves from competitors in saturated markets. This new economic and social framework demands a rethinking of the role of marketing in the value creation process (Kotler et al. 2019). As a result of this paradigm shift, companies must stop focusing solely on increasing their internal efficiency and instead seek to develop external resources in their search for value co-creation with consumers (Prahalad and Ramaswamy 2004).

Despite the focus on social media leverage, start-ups and small businesses often suffer from a lack of understanding and knowledge of the utilization of social media tools (Fischer and Reuber 2011). Although substantial research points to successful strategies and the key features of social media to manage businesses in the current age of value co-creation, research is still scarce regarding how small businesses and start-ups can better utilize social media and user participation. Further, few companies have achieved viable results, as many have faced challenges in creating strategies to tap social media's potential. Many companies have also struggled to adapt to an environment requiring more open and collaborative relationships (Kaplan and Haenlein 2010).

Hence, this paper tries to show how SNM could influence CPB (Poulis et al. 2018) given the reconciling role of value co-creation (Moghadamzadeh et al. 2020). Scholars have studied this relationship during the last decade, but this research presents a more detailed view by covering several value co-creation kinds and their influence on CPB. The authors

try to show if SNM could positively affect CPB and if this could happen through value co-creation. Research on this topic is scarce. Then, the literature is reviewed, and some hypotheses are made accordingly. Clarification of the research methodology is followed by an introduction of the findings. Finally, some practical implications, future research recommendations, research limitations, and concluding remarks are provided.

2. Literature Review

Businesses should consider social media influencers as one of the ways to market their products and services in the current challenging times, where many of the activities of businesses are shifting to online platforms (Koay et al. 2021). Olanrewaju et al. (2020) emphasize the significance of social media usage for the development of digital businesses (Franco-Riquelme and Rubalcaba 2021). Managers have used social media to advertise their goods and services and make sure that potential customers are chosen during the screening process (Aggarwal and Singh 2013). Thus, among the most significant and valuable e-business models that are currently emerging in today's world are digital platforms (Saberian et al. 2020). The continuation intention theory is one of the social media usage theories.

The goal of continuation intention is to determine users' intentions to continue using a particular technology or system by analyzing their post-adoption behavior (J.-H. Park 2014). Adoption is a crucial step toward the initial success of social networking sites (SNS), according to Bhattacharjee (2001), but long-term success depends on an SNS user's continued use (Sibona et al. 2017).

The Technology Continuity Theory is an additional social media usage theory. The Technology Continuance Theory (TCT), which forecasts whether users intend to continue using a technology or not, was first developed by Liao et al. (2009). The TCT was recommended as a more effective model for evaluating an information system's continuity intention over its entire life cycle of acceptance (Khayer and Bao 2019). This theory was created by combining three widely used information system models, including the expectation-confirmation model, the technology acceptance model, and the cognitive model, in order to predict how innovative technologies will be used over the long term with respect to their applicability and descriptive power (Liao et al. 2009).

New financial technologies (Fintech) are being introduced as a result of society's digital transformation for use in payments, fund transfers, and other financial transactions. These financial transactions are processed using highly technical mechanisms that include hardware, software, APIs, cryptography, and network protocols (Nikkel 2020). Social media play a significant role in fintech. Because some users of these services shared positive testimonials on social media, which may have piqued people's interest in using this technology (Buchak et al. 2018). On the other hand, some misinformation that circulated via social media may have scared some people away from using these technologies, especially financial ones (Piscicelli et al. 2015). The widespread use of Instagram as a platform can greatly aid the advancement of this technology. Followers are more likely to view Instagram influencers as attractive and reliable when they perceive their social media marketing activities favorably (Koay et al. 2021).

One of the key phases of the consumer decision-making process is the information search. When a need is identified, consumers look for information about the goods or services that can meet it (T. Park 2020). New methods of looking for and obtaining information on the wide range of goods and services available have been made possible by the social media revolution. It has made it possible for customers to communicate with one another about brands quickly and easily (Powers et al. 2012). Most people believe that content created by Internet users, who are also consumers, is free from commercial influences (Bronner and De Hoog 2010). Due to their trust, consumers turn to forums, blogs, and other unbiased social media platforms to gather data for making decisions (Powers et al. 2012).

2.1. SNM and Value Co-Creation (VCC)

SNM behavior is rapidly evolving, but most experts have yet to agree on a comprehensive definition (Ibrahim et al. 2020). Some researchers define it simply as using social media platforms for marketing; however, some scholars have defined it differently by focusing on many aspects of this phenomenon, including but not limited to (Agichtein et al. 2008; Kim and Ko 2010, 2012; Naaman et al. 2011; Wang et al. 2019):

- Entertainment: the experience of using social media is what leads to play and fun;
- Interaction: it is mutual or reciprocal action through which the parties can affect each another;
- Trendiness: By giving customers the most recent information on the newest trends, it is a social media tool for grabbing attention;
- Customization: Giving customers the option to design and customize products is an efficient way for businesses to increase customer interactions;
- Word of mouth: It is described as “the believability of the product position information contained in a brand, which depends on the willingness and stability of firms to deliver what they promise”.

Two general approaches have been introduced toward SNM: promotional and relational approaches (Ibrahim et al. 2020). The first approach focuses on promoting a firm and its products, and the second approach focuses on using social media as a communication tool for marketing. The aforementioned definition of SNM is an inclusive one involving both approaches (Aji et al. 2020; Khan et al. 2019) and this definition in this study.

SNM behavior are capable of positively influencing value co-creation by persuading the consumers towards firms’ value creation logic (Sijabat et al. 2020). Cheung et al. (2020) show that effective social media marketing strategies lead to the strengthening of value co-creation. Consumers are entertained on social media platforms, obtain customized services, interrelate with firms and other consumers, endorse the firm by word of mouth, and finally become a part of the social media trends; thus, they could be a part of value creation processes of the firm and thus co-create value. Such co-created values could be comprehensive (Akar and Dalgic 2018). Social media platforms have gone digital, allowing users to interact more with brands, learn more about goods and services, and participate in the value creation process (Aluri et al. 2015; Chathoth et al. 2014). Social media is crucial in this regard for enhancing customer value co-creation (Martini et al. 2012).

However, in this study, three types of value co-creation have been used: economic, enjoyable, and relational value co-creation. Value can be classified as intrinsic (the first two types) or extrinsic (the third type) (Khajeheian and Ebrahimi 2021). Economic value is linked to the products’ and services’ economic outcomes, such as the cost and benefit of rendering high-quality and customized services and providing consumers with more control. Additionally, relational value is concerned with the value derived from the emotional or personal connections between service providers and their clients. However, enjoyment value relates to intrinsic advantages or psychological prizes in the consumption experience (Chen and Wang 2016). Consequently, this study uses these three types of co-created values to cover both intrinsic and extrinsic values created by consumers.

SNM practices try to persuade possible clients to buy a firm’s products or services or encourage previous consumers to return. Thus, such behavior aims to create value, chiefly through value co-creation techniques, engaging consumers with SNM behavior. Some investigations show that this value co-creation is mainly economic (Casais and Sousa 2019; Secundo et al. 2020; Zhang et al. 2015). Determining whether SNM can influence the co-creation of economic value on social media platforms is the goal of this study.

Hypothesis H1. *SNM is capable of having a positive effect on economic value co-creation on social media platforms.*

SNM may have an impact on enjoyment value co-creation on social media platforms in addition to economic value co-creation. That is, SNM could provide intrinsic benefits

or psychological rewards for consumers. For example, Bianchi (2021) reported that internet services are capable of boosting elderly well-being. (Khajeheian and Ebrahimi 2021) believed that there is a link between media branding—as a part of SNM—and enjoyment value co-creation. There is little research on this connection, though. As a result, the following theory is proposed.

Hypothesis H2. *SNM has the power to influence the co-creation of entertainment value on social media platforms in a positive way.*

SNM may also affect the co-creation of relational value. This relates to the value that is produced by the interpersonal or emotional connections that service providers and their clients have (Lund et al. 2020). Since the SNM framework is based on the networking philosophy, we could think that such kind of value co-creation is an eminent consequence of SNM (Plé 2017). Relational or emotional links might be created between service providers and consumers, bringing about value co-creation. The literature on social commerce mainly focused on such a relationship indirectly (Zhang et al. 2020); nonetheless, this paper overtly studies this link. Therefore, the following hypothesis is made.

Hypothesis H3. *SNM is capable of positively influencing relational value co-creation on social media platforms.*

2.2. Value Co-Creation and CPB

The relationship between CPB and value co-creation has been studied in earlier studies. Social media platforms were the main focus of the majority of these investigations. For example, Poulis et al. (2018) believed that firms are obliged to produce content for enhancing value co-creation and, consequently, modifying CPB. According to some research, value co-creation behavior could significantly influence CPB (Bijmolt et al. 2010; Foroudi et al. 2020; Jaakkola and Alexander 2014; Joshi and Rahman 2015; Nambisan and Baron 2009). It is expected that the studies in this area pay attention to economic value co-creation only because it can be measured more easily measurable, and a majority of the firms consider such kind of value co-creation in their key performance indicators (Dang et al. 2020). Kennedy et al. (2017) asserts that further investigation is still required to determine the positive effects of each co-creation component on purchase intention, despite prior research to the contrary.

They merely paid regular attention to SNM, but Arora et al. (2019) and Weismueller et al. (2020) reported that effect on social media platforms. This study attempted to demonstrate whether this is the case on Iranian social media platforms. Given that it addresses the SNM as well as social media marketing, this strategy is more all-encompassing. So, the following hypothesis is put forth.

Hypothesis H4. *Co-creation of economic value has the potential to have a positive impact on CPB on social media platforms.*

Moreover, enjoyment value co-creation that addresses several intrinsic benefits, as well as many kinds of psychological rewards in the consumption experience, is a vital issue that might influence consumers purchase performance; however, studies on this issue are scarce (Bu et al. 2020; Chen and Wang 2016). The consumers' intense engagement in enjoyment value co-creation means that they would alter their purchase performance (Khajeheian and Ebrahimi 2021; Mashhadizadeh and Saedi 2020), and this is eased on social media platforms by offering a productive ground for enjoyment value co-creation (Al Halbusi et al. 2020). Consequently, the following hypothesis is made to show if this is the case on Iranian social media platforms.

Hypothesis H5. *Co-creation of enjoyment value has the power to influence CPB in a positive way on social media platforms.*

The study of relational value co-creation is completed by taking behavioral approaches into consideration (Baumann and Meunier-FitzHugh 2014). This type of value co-creation is thought to be a crucial component of the value co-creation logic on social media platforms because users who become consumers may easily and without time constraints generate relational or emotional links with suppliers (Dolan et al. 2019; Lund et al. 2020). In order to demonstrate whether relational value co-creation can positively influence CPB on Iranian social media platforms, the following hypothesis is made.

Hypothesis H6. *Co-creation of relational values has the power to influence CPB on social media platforms for the better.*

3. Methodology

3.1. Research Framework

Companies have been known to utilize social media to create new business opportunities and strategic management practices, while improving organizational effectiveness by reconfiguring their existing business resources and practices (Ngai et al. 2015). They can co-create value and collaborate with its users through active fan participation in diverse activities, such as developing new products, upgrading its existing content, and participating in social media marketing campaigns (Perlberg 2015; Williams 2017). Lin et al. (2018) state that Brands can use social media platforms to share their latest news and products with consumers, inviting them to share their positive experiences with the brand, to provide suggestions for improvements, and to share their ideas about new product development. This facilitates value co-creation by arousing consumers' interests in reading information about the brand, driving their intention to interact with brands on the topics of their personal interest (Lin et al. 2018). Ferm and Thaichon (2021) show that social media usage intensity influenced co-creation behaviors. Additionally, Zhang et al. (2020) found intensiveness of social media usage to be a significant factor in co-creation as a predictor of innovation.

Based on Vega-Vazquez et al. (2013) value co-creation significantly affects attitudinal loyalty and also behavioral loyalty that are post-purchase phenomena. Kunja and Acharyulu (2018) state that eWOM significantly influences consumer purchase intention through value co-creation (Kunja and Acharyulu 2018).

As discussed above, this research investigates the likely influence of SNM on triadic value co-creation logic, i.e., economic, enjoyment, and relational values (Khajeheian and Ebrahimi 2021). This essay aims to demonstrate the potential impact of these CPB value co-creations on Iranian social media platforms (Foroudi et al. 2020; Joshi and Rahman 2015). Furthermore, age is regarded as a control variable in this study because it can reveal interesting results in this context and aid in determining which of affordability, reputation, and patient safety climate is superior (Figure 1).

3.2. Research Methods

The questionnaire asks questions regarding the measurement models for our constructs' items. All metrics have been changed from earlier studies. Prior to the test, the questions' clarity was checked.

A 5-point Likert scale with the options "strongly disagree = 1" and "strongly agree = 5" was used for the 27 items. Three items originally created by Shim and Eastlick (1998), Homer and Kahle (1988), and Kim et al. (2002) were modified for use in Kim et al.'s study to measure CPB (1988). Meanwhile, 18 items modified from a study by Kim and Ko (2010) were used to measure SNM dimensions. Nine items—three for each of enjoyment value, economic value, and relational value—were modified from a study by Khajeheian and Ebrahimi (2021), originally created by Chen and Wang (2016). To verify the content validity of the questionnaire, the ICC coefficient was checked for consistency and complete agreement. In statistics, the intraclass correlation, or the intraclass correlation coefficient, is a descriptive statistic that can be used when quantitative measurements are made on units

that are organized into groups. It describes how strongly units in the same group resemble each other (Ebrahimi et al. 2022b).

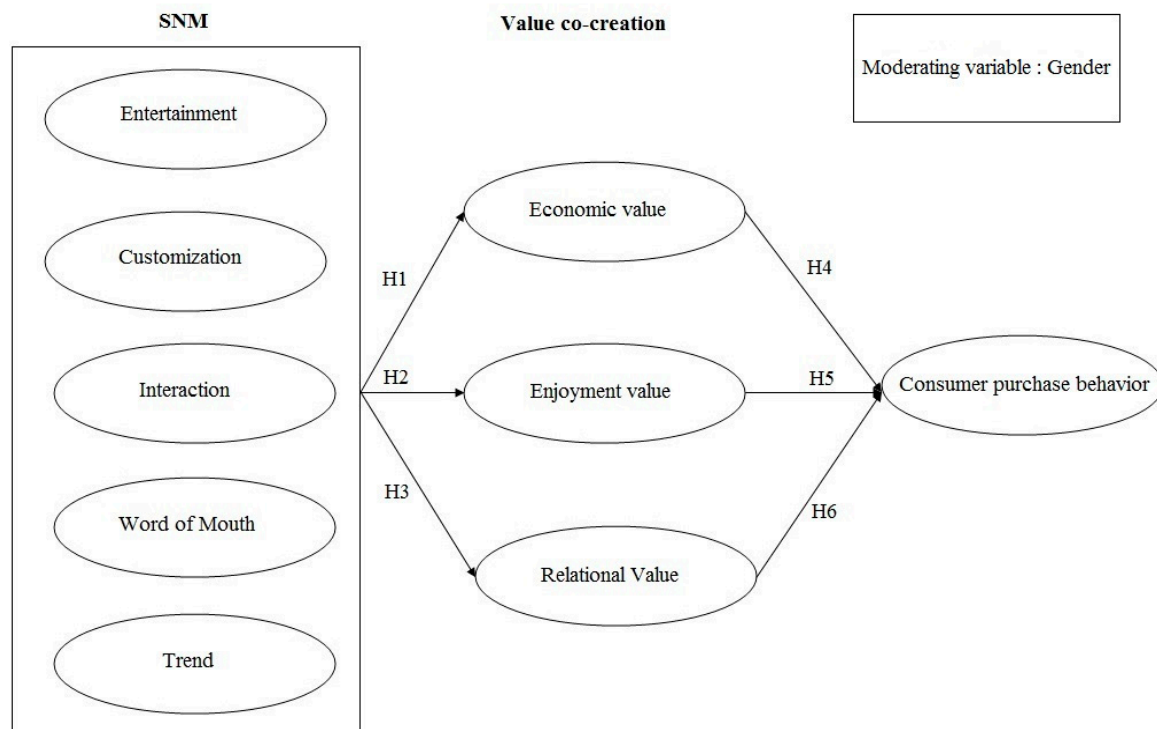


Figure 1. Research framework (source: authors' elaboration).

Users who had made online purchases on the Instagram platform were included in the study's statistical population. Through the Instagram platform, a link to the online survey was distributed to respondents. Online links were posted and shared on Instagram in order to get the desired response from respondents. Various channels on Instagram were used to share the questionnaires.

The PLS-SEM method does not use randomization to determine the minimum sample size. Bootstrapping techniques are used to run PLS-SEM models with small sample sizes, but the sample size has a significant impact on the models' results and precision (Hair et al. 2021). Therefore, the PLS-SEM models' features were used to determine the ideal sample size using the SPSS Sample Power Sampling program. The multivariate regression model with the most variables had three when a 95% confidence level, a 0.95 power of increment, and a 0.05 R-squared increment were taken into account. The research model resulted in a minimum sample size of 331. Data was continuously collected in order to produce more questionnaires, increasing the validity of sampling and obtaining more information about Instagram. Lastly, the analysis included 427 completed questionnaires. A pilot study was conducted before the official data collection process to confirm the validity and reliability of the content from the sample size of 25. From November 2020 to February 2021, data was gathered.

The data for this study were collected using a convenience sampling method. At the same time, this method is frequently applied to eliminate bias in quantitative studies. Additionally, we used the common method bias (CMB) test (Podsakoff and Organ 1986). Seven variables were used in Harman's single-factor analysis to guarantee that CMB was not present in the collected data. Then, each factor was loaded into just one factor. The analysis reveals that the newly created factor accounts for 47.25% of the variance, which is less than the required amount of 50%. Consequently, there were no issues with the CMB in the data that was gathered.

Men and women made up, respectively, 41.7% and 58.3% of the respondents in the research sample. The age range of 23 to 37 years was represented by the largest percentage of respondents (50.1%). Furthermore, 45.7% of the respondents had a bachelor's degree, indicating that the majority of respondents had high levels of education. Along with being instructed to answer the questions honestly and loyally, respondents were also instructed to take into account Instagram's current state. The majority of respondents (34.2%) spent more than 3 h per day on various Instagram pages. Table 1 provides a description of the respondents' demographic data.

Table 1. Demographic attributes.

Respondent Profile		(N = 427)	
Attributes	Distribution	Frequency	Percent
Gender	Male	178	41.7
	Female	249	58.3
Age	22 and under 22 years old	112	26.2
	23 to 37 years old	214	50.1
	38 to 50 years old	81	19
	51 years old and up	20	4.7
Education	Diploma and below diploma	14	33.3
	Associate degree	152	8.4
	Bachelor degree		45.7
	Master degree	134	10.8
	PhD	44	1.9
Time on Instagram (Daily average)	Less than 1 h	93	21.8
	1 to 2 h	111	26
	2 to 3 h	77	18
	More than 3 h	146	34.2

4. Result

The partial least squares structural equation modeling (PLS-SEM) approach was used for the model estimation (Hair et al. 2021). When dealing with complex models, irregular data, and small samples, PLS-SEM provides sufficient features (Shmueli et al. 2019). Measurement models were assessed by SmartPLS 3 (version 3.3.2). Software known as SmartPLS 3 (version 3.3.2) was used to evaluate measurement models (Ringle et al. 2015). Both reflective and formative measurement models can be used with PLS-SEM (Hair et al. 2017). CTA analysis was used to verify reflective measurement models (p -value > 0.05) (Gholampour et al. 2020; Hair et al. 2017, 2019; Janavi et al. 2021). Reflective measurement models were therefore taken into consideration for the assessments.

For running an IPMA, PLS-SEM offers fixed latent variable scores. The latter compares the average latent variable scores of the predictors with the structural model's overall impact on a predictor variable (Hair et al. 2019; Ringle and Sarstedt 2016). The variances in CPB ($M = 3.631$, $SD = 1.017$), SNM ($M = 3.647$, $SD = 0.920$), economic value ($M = 3.797$, $SD = 0.952$), enjoyment value ($M = 3.540$, $SD = 1.059$), and relational value ($M = 3.708$, $SD = 1.035$) were significant, indicating that members of this sample were significantly different and they understood the significance of CPB by taking value co-creation and SNM into consideration. Therefore, the sample was appropriate to test our hypotheses.

4.1. Evaluation of Measurement Models

All Cronbach values, CR values, and rho A values were higher than the threshold of 0.7, as shown in Table 2, demonstrating internal consistency and reliability (Chaouali et al. 2020; Ebrahimi et al. 2021b, 2022a; Hair et al. 2021; Moghadamzadeh et al. 2020; Sanchez 2013). All of the outer loading values exceeded the 0.7 thresholds (Henseler et al. 2015; Hair et al. 2021; Sarkar et al. 2020), and the AVE scores exceeded the cutoff point of 0.50, demonstrating the internal consistency of the measurement model (Hair et al. 2019; Sarstedt et al. 2019). The measurement model's convergent validity was also demonstrated by the AVE and outer loading values (Roshandel-Arbatani et al. 2019; Nunkoo et al. 2020). It was

attempted to confirm that collinearity was not a serious problem before conducting the analysis (Sarstedt et al. 2019).

Table 2. Measurement models, convergent validity, and reliability.

Variables and Items	Outer Loadings	VIF
CPB (AVE = 0.657, C. alpha = 0.739, Rho_A = 0.749, CR = 0.852)		
CPB 1: Many users perform online shopping following Instagram advertisements.	0.757	1.352
CPB 2: I am loyal to some brands because of Instagram's advertisements.	0.842	1.535
CPB 3: My top choices for repeat purchases come from previously purchased brands.	0.830	1.604
Value co-creation		
<i>Economic value</i> (AVE = 0.710, C. alpha = 0.800, Rho_A = 0.826, CR = 0.880)		
ECO 1: The Instagram platform's analysis of user comments provides information with a positive economic impact.	0.797	1.780
ECO 2: Instagram user participation results in financial gain through coupons, tickets, and other price reductions.	0.874	2.057
ECO 3: The cost of finding the right articles for other users on Instagram is reduced thanks to user contributions.	0.855	1.554
<i>Enjoyment value</i> (AVE = 0.748, C. alpha = 0.832, Rho_A = 0.841, CR = 0.899)		
ENJ 1: Instagram users enjoy reading other users' posts.	0.861	1.957
ENJ 2: Other users find it enjoyable to read various comments.	0.843	1.806
ENJ 3: Other users enjoy reading the suggested articles and posts on Instagram.	0.890	2.014
<i>Relational value</i> (AVE = 0.639, C. alpha = 0.726, Rho_A = 0.758, CR = 0.841)		
REL 1: Instagram users can connect with new authors, influencers, and deserving individuals.	0.832	1.323
REL 2: Instagram is used to form new friendships.	0.807	1.687
REL 3: Instagram users can adjust costs and discover new ways to live economically.	0.757	1.490
SNM (AVE = 0.566, C. alpha = 0.954, Rho_A = 0.958, CR = 0.959)		
<i>Entertainment</i> (AVE = 0.624, C. alpha = 0.801, Rho_A = 0.810, CR = 0.869)		
ENT 1: Instagram is thought to have thought-provoking content.	0.761	1.711
ENT 2: Instagram is fun to use.	0.814	1.746
ENT 3: Instagram is a fun way to gather information about companies and products.	0.799	1.774
ENT 4: Instagram is a quick way to pass time.	0.783	1.443
<i>Customization</i> (AVE = 0.654, C. alpha = 0.864, Rho_A = 0.875, CR = 0.903)		
CUS 1: You can search for specialized information on Instagram.	0.716	1.558
CUS 2: Instagram provides tailored services.	0.900	2.761
CUS 3: Users' preferred data can be found on Instagram's sparkling feed.	0.894	2.048
CUS 4: Instagram is simple to use.	0.709	2.575
CUS 5: Everyone is using Instagram.	0.802	3.017
<i>Interaction</i> (AVE = 0.718, C. alpha = 0.868, Rho_A = 0.883, CR = 0.910)		
INT 1: Sharing opinions on Instagram is simple.	0.865	2.487
INT 2: It's simple to converse with other users on Instagram and exchange ideas.	0.924	3.724
INT 3: Instagram makes it simple to engage in two-way communication.	0.739	1.869
INT 4: It is simple to share data with others through Instagram.	0.850	2.127
<i>Word of mouth</i> (AVE = 0.712, C. alpha = 0.797, Rho_A = 0.807, CR = 0.881)		
WOM 1: I enjoy informing my friends about companies, goods, or services on Instagram.	0.818	1.542
WOM 2: I enjoy posting Instagram content to my page, blog, or microblog.	0.896	2.153
WOM 3: I enjoy talking to my friends about the products, brands, or services I've used from Instagram.	0.815	1.791
<i>Trend</i> (AVE = 0.892, C. alpha = 0.879, Rho_A = 0.879, CR = 0.943)		
TRE 1: Using Instagram, it is a leading branding strategy.	0.943	2.598
TRE 2: Instagram posts are current.	0.946	2.598

Notes: SNM, Social network marketing; CPB, Consumer purchase behavior; Average of Variance Extracted (AVE), Cronbach's alpha (C. alpha), and reliability indices Rho A and Rho A for each construct; Composite Reliability, or CR; Variance Inflation Factor at the item level, or VIF.

Assessment of the complete VIFs (for all the items). The VIF values were below the cutoff of 5, showing that collinearity is not a problem (Soleimani et al. 2022). In contrast, values below 3 are regarded as ideal (Hair et al. 2021; Sarstedt et al. 2019; Ebrahimi et al. 2022b). Table 2 displays the outcomes of the values for the outer VIFs. We assessed the discriminant validity using the correlations' heterotrait-monotrait ratio (HTMT), in accordance with the studies by Hair et al. (2017) and Henseler et al. (2015). (Table 3). The measurement model's discriminant validity was reached when all of the HTMT ratios were below 0.85.

Table 3. Heterotrait-Monotrait Ratio (HTMT).

Construct	1	2	3	4	5
CPB					
Economic value	0.699				
Enjoyment value	0.772	0.827			
Relational value	0.768	0.845	0.828		
SNM	0.636	0.798	0.635	0.816	

Notes: SNM, Social network marketing; CPB, Consumer purchase behavior.

4.2. Structural Model Assessment

Outlier data were studied before the hypotheses were tested in order to produce better and more accurate results. For testing unobserved population heterogeneity and performing a robustness analysis on PLS-SEM, the FIMIX approach was used. Actually, FIMIX-PLS is primarily useful in this regard by establishing model selection criteria that make it possible to choose how many data segments should be reserved (Hair et al. 2016). The value of EN in this study is 0.869, which is a positive and acceptable value, making it one of the best criteria for this objective (Ebrahimi et al. 2022a; Hair et al. 2017; Ramaswami et al. 1993). Table 4 gives data on the structural model and its significance; this paper used the percentile bootstrapping procedure with 1000 subsamples and reported the 95% confidence intervals. SNM had a significant directly influenced the economic value ($\beta = 0.712$, CI = [0.661; 0.758]). Accordingly, H1 is supported. SNM positively and significantly influenced the enjoyment value ($\beta = 0.840$, CI = [0.813; 0.866]). Therefore, H2 is supported as well. SNM positively and significantly influenced relational value ($\beta = 0.792$, CI = [0.760; 0.822]). Hence, H3 is supported. Economic value significantly and directly influenced CPB ($\beta = 0.392$, CI = [0.330; 0.463]). Accordingly, H4 is supported. Furthermore, enjoyment value significantly and positively influenced CPB ($\beta = 0.222$, CI = [0.134; 0.310]). Consequently, H5 is supported. Meanwhile H6 ($\beta = 0.343$, CI = [0.253; 0.423]) is supported showing positive influence of relational value on CPB (Table 4 and Appendix A).

Table 4. Results of research hypotheses and model fit.

Hypotheses	Direct Effect	SD	T-Statistics	p Value	Low CL	High CL	Decision	Permutation Test p-Value
H1	0.712	0.025	28.392 ***	0.000	0.661	0.758	Supported	0.595
H2	0.840	0.014	61.490 ***	0.000	0.813	0.866	Supported	0.723
H3	0.792	0.017	47.720 ***	0.000	0.760	0.822	Supported	0.018
H4	0.392	0.034	11.450 ***	0.000	0.330	0.463	Supported	0.102
H5	0.222	0.046	4.799 ***	0.000	0.134	0.310	Supported	0.279
H6	0.343	0.042	8.117 ***	0.000	0.253	0.423	Supported	0.001
Model fit	R ²	R ² Adjusted	Q ² predict					
CPB	73.8%	73.6%	0.72					
Economic value	50.6%	50.5%	0.348					
Enjoyment value	70.6%	70.5%	0.519					
Relational value	62.8%	62.7%	0.376					

Note: t > 3.29 at *** p < 0.001; two-tailed test.

The R² was calculated to assess the model's in-sample fit. For CPB, the model accounted for 73.8% of the variance. Furthermore, the PLSpredict procedure with 10 folds and 10 repetitions was used to evaluate the out-of-sample predictive power (Shmueli et al. 2016, 2019). CPB's Q² predicate value was strong and above zero. The model was predictively relevant as a result. In the interim, we concentrated on CPB as the sole target construct of the model. The model had high predictive power because it had lower root mean square errors (RMSE) for all of the target construct's indicators when compared to the PLS-SEM benchmark (Table 5). Additionally, the Bentler and Bonett indexes as well as the NFI index were applied here (NFI for this model is 0.790). NFI produced values in the range of 0 and 1. NFI values that are closer to 1 indicate better model fit (Bentler and Bonett 1980).

Additionally, RMS-theta values lower than 0.12 indicate a model that fits the data well, whereas higher values indicate a model that does not (Hair et al. 2014).

Table 5. PLSpredict assessment of the manifest variable CPB.

Items	RMSE _{PLS-SEM}	RMSE _{LM}	ΔRMSE
CPB1	0.520	0.529	−0.009
CPB2	0.738	0.752	−0.014
CPB3	0.639	0.653	−0.014

Notes: RMSE = root mean squared error; gray-shaded results = PLS-SEM's predictive power is lower than the LM benchmark.

4.3. Moderating Role of Gender

We applied the MICOM method, which was recommended by Hair et al. (2017). Three stages are covered by MICOM: (i) the assessment of configural invariance; (ii) the assessment of compositional invariance; and (iii) the assessment of equal means and variances. Step 1 involves setting configural invariance to ensure that each latent variable in the PLS path model has been specified equally for all the groups. When constructs are equally parameterized and estimated across groups, configurational variance occurs. It is required to conduct an initial qualitative assessment of the latent variable specification across all groups (Hair et al. 2017; Basirat et al. 2022).

We can accept compositional invariance in step 2 if the test results in a *p*-value greater than 0.05. When the mean values and (logarithms of) variances among the groups are not significantly different, step 3 establishes full measurement invariance. We can compare the standardized coefficients of variation between the two gender groups thanks to Table 6's evidence of partial measurement invariance. The permutation test approach was used to compare male and female groups in order to assess gender's moderating influence. A significant difference between these two types of groups is seen in the research in H3 and H6, given a *p*-value < 0.05 and confidence intervals (see Table 6 and Appendix B for a MICOM plot of CPB). In these two hypotheses, the female group tends to exhibit greater effects than the male group.

Table 6. MICOM test.

Step 2. Compositional invariance test using permutation			
	C = 1	95% CI	CIE?
CPB	0.981	[0.997; 1.000]	Yes
Economic value	0.997	[0.998; 1.000]	No
Enjoyment value	1.000	[0.999; 1.000]	Yes
Relational value	0.973	[0.996; 1.000]	Yes
SNM	0.991	[0.998; 1.000]	Yes
Step 3. Equal mean assessment			
	D = 0	95% CI	EMV?
CPB	−0.076	[−0.187; 0.192]	No
Economic value	−0.065	[−0.200; 0.191]	No
Enjoyment value	0.158	[−0.194; 0.185]	No
Relational value	0.003	[−0.193; 0.185]	No
SNM	0.154	[−0.192; 0.174]	No
Step 3. Equal variance assessment			
	R = 0	95% CI	EV?
CPB	−0.261	[−0.258; 0.253]	No
Economic value	0.137	[−0.267; 0.252]	No
Enjoyment value	0.173	[−0.268; 0.257]	No
Relational value	−0.224	[−0.234; 0.214]	No
SNM	−0.160	[−0.269; 0.258]	No

Notes: Confidence interval, compositional invariance, and C = 1 (correlation value = 1). Established; D = 0: difference in the mean value of the composite (=0); CI: confidence interval; EMV: equal mean values; R = 0: confidence interval; EV: equal variances; logarithm of the composite's variances ratio (R = 0).

4.4. Importance-Performance Map Analysis (IPMA)

The PLS-SEM analytical tool IPMA explicitly spreads the standard path coefficient estimates in a more useful manner (Ringle and Sarstedt 2016). More precisely, IPMA provides a comparison of importance and performance (i.e., the overall impact of predecessor constructs in predicting a target construct, i.e., average latent variable scores). Because of this, IPMA is helpful for categorizing predecessors that perform relatively poorly but are crucial to the target constructs. The CPB predicted by four forebears is the target construct in this study (Appendix C).

The highest importance score for “SNM” is shown to be 0.738, meaning that if Instagram channels improve their SNM performance by one unit point, their overall SNM will also improve by 0.738. Additionally, our findings show that the relational value is associated with the lowest performance (38.424), indicating a fantastic opportunity for improvement in this area. A complete list of importance-performance values is shown in Table 7.

Table 7. Importance-performance map analysis.

Latent Variables	Importance	Performance
Economic value	0.392	41.060
Enjoyment value	0.222	44.812
Relational value	0.343	38.424
SNM	0.738	42.012

Note: At the level of 0.10, all total effects (importance) greater than 0.10 are significant. The bold values denote the highest performance value and importance (total effect).

4.5. Necessary Condition Analysis (NCA)

NCA, a relatively new approach and data analysis technique created by Dul in 2016, opened the door for categorizing necessary conditions in data sets (Dul 2016). NCA highlights regions in scatter plots of dependent and independent variables that could indicate the presence of a necessary condition rather than analyzing the average relationships between dependent and independent variables (Richter et al. 2020; Ebrahimi et al. 2021a).

This study attempted to demonstrate whether or not SNM, economic value, enjoyment value, and relational value were prerequisites for CPB. The scatter plots for each pertinent relationship are shown in Figure 2. The effect sizes are shown in Table 8. A separate column for the accuracy of the ceiling line was not added because it is 100% accurate for the ceiling envelopment-free disposal hull (CE-FDH).

Table 8. Bottleneck table and NCA effect sizes.

Bottleneck CPB	SNM	Economic Value	Enjoyment Value	Relational Value
0	NN	NN	NN	NN
10	13.4	NN	NN	NN
20	14.3	NN	NN	8.3
30	14.3	NN	8.3	8.3
40	29.4	25.0	16.7	8.3
50	31.1	33.3	16.7	8.3
60	51.3	41.7	50.0	33.3
70	51.3	50.0	50.0	41.7
80	64.7	50.0	50.0	41.7
90	73.1	50.0	50.0	58.3
100	73.1	50.0	50.0	83.3
NCA effect sizes (Accuracy and fit are 100%)				
Construct	CPB CE-FDH	Slope		
SNA	0.389 *	1.337		
Economic value	0.285 *	1.179		
Enjoyment value	0.257 *	1.518		
Relational value	0.257 *	1.536		

Note: $t > 1.96$ at $* p < 0.05$; CE-FDH, ceiling envelopment-free disposal hull.

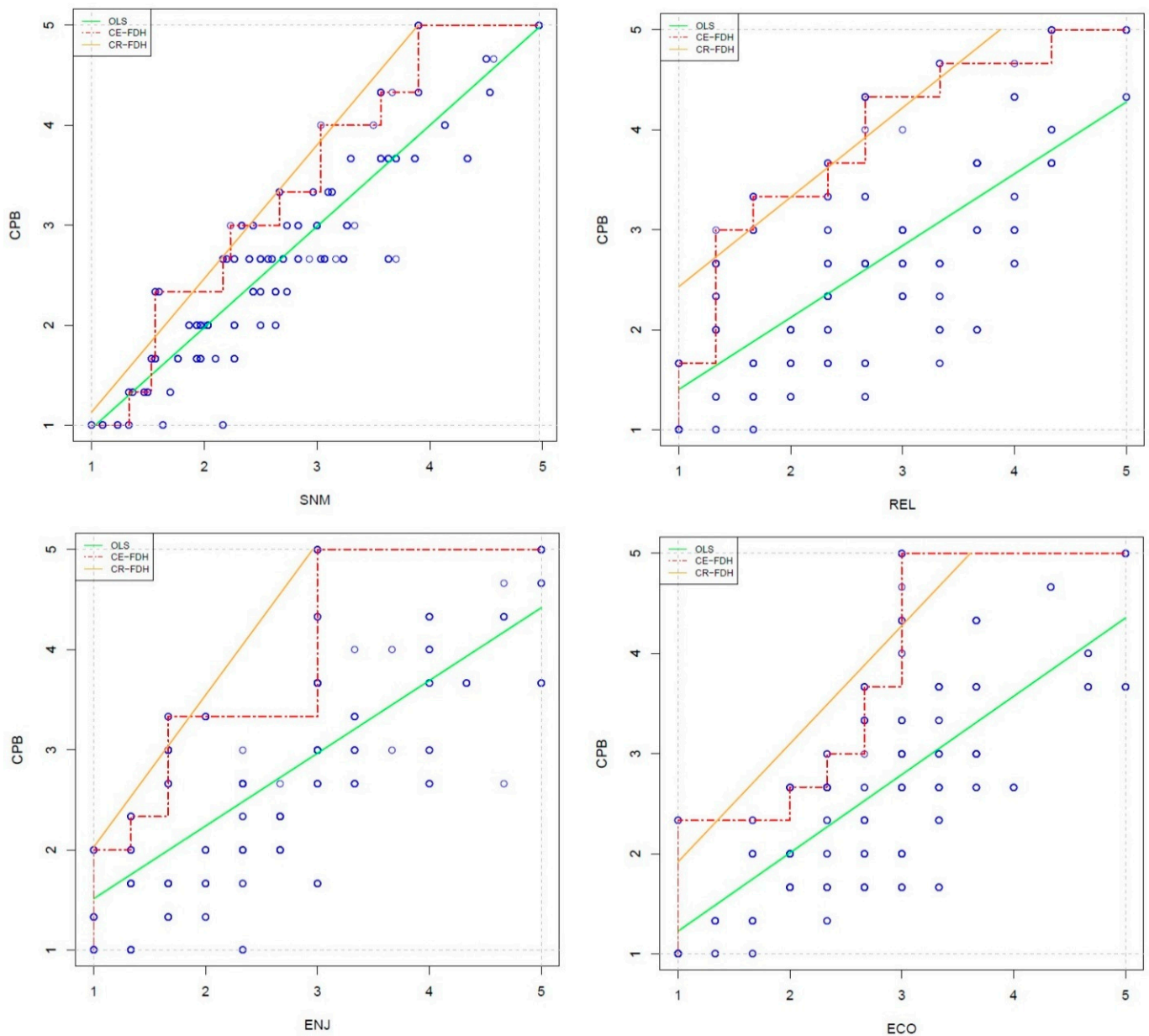


Figure 2. Scatter plots of NCA.

The findings of the NCA (see Table 8) indicate that SNM, economic value, enjoyment value, and relational value are necessary conditions for CPB that are meaningful ($d \geq 0.1$) and significant ($p < 0.05$). The bottleneck tables allow for a detailed evaluation of each prerequisite. Table 8 demonstrates that in order to achieve a 50% level of CPB, four prerequisites must be met: relational value must be at least 8.3%, enjoyment value must be at least 16.7%, economic value must be at least 33.3%, and SNM must be at least 31.1%.

5. Discussion

Consumer behavior and business practices have changed as a result of social media and internet use. Through reduced costs, enhanced brand awareness, and increased sales, social and digital marketing present significant opportunities for businesses (Dwivedi et al. 2021). So, conventional marketing practices and methods have experienced profound changes following the birth of social media platforms. Soon, SNM has become a mandate for almost any company to prosper. Moreover, consumers have changed their performances

using social media platforms since their interaction with other consumers, sellers, and potential buyers are facilitated; thus, they are engaged in co-creating value.

SNM (including five characteristics: entertainment, customization, interaction, word of mouth, and trend) were found to be a factor affecting value co-creation after reviewing the literature in this area, and as a result the first to third research hypotheses were developed. The following step involved considering the role of eco-friendly consumer attitudes in the relationship between value co-creation and CPB and looking into hypotheses H4–H6. This essay investigates the impact of SNM on various forms of value that were jointly created by them. It also addresses the impact of various co-created values on CPB. In this study, the control variable is gender as well. Particularly for social media marketers, this study benefits marketing activists.

According to the results, all the hypotheses are supported. H1, H2, and H3 showed that SNM influences economic, enjoyment and relational value co-creation. Among the hypotheses, H2 and H3 showed the main influence. This is consistent with [Bernoff and Li \(2008\)](#), [Bughin et al. \(2011\)](#), [Fagerström and Ghinea \(2013\)](#), [Mount and Martinez \(2014\)](#), [Dong and Wu \(2015\)](#), [Aluri et al. \(2015\)](#), [Plé \(2017\)](#), [Bertschek and Kesler \(2022\)](#), [Cheng and Shiu \(2018\)](#), [Kim and Choi \(2019\)](#), [Khajeheian and Ebrahimi \(2021\)](#), [Lund et al. \(2020\)](#), [Zhang et al. \(2020\)](#), [Cheung et al. \(2020\)](#), and [Bianchi \(2021\)](#). The interactions between businesses and their customers are evolving as a result of ongoing technological advancements, going beyond the simple exchange of goods and services for money. SNM play a vital role in spurring innovations as user involvement in social media is wide and varied. By enabling discussion and the sharing of content, social media create opportunities for consumers to co-create value and help firms to achieve innovations in development costs and time.

As demonstrated by H4, H5, and H6, co-creation of economic, enjoyable, and relational value has a positive influence on CPB on social media platforms. These results are in line with those of the studies conducted by [Bijmolt et al. \(2010\)](#), [Jaakkola and Alexander \(2014\)](#), [Joshi and Rahman \(2015\)](#), [Pee \(2016\)](#), [Algharabat \(2018\)](#), [Foroudi et al. \(2020\)](#), and [Guzel et al. \(2020\)](#). According to these results, businesses that put a strong emphasis on online presence and customer engagement in order to serve customers and meet their needs are more successful in attracting customers because consumers who exhibit co-creation behavior feel a connection to the co-created product and intend to purchase it. They continue to have the intention to purchase the co-created product even after discovering it and determining whether their contributions are evident in the finished product.

According to the permutation test, women were more significantly affected by SNM than men were by relational value co-creation (H3) and by relational value co-creation on CPB (H6). Without considering the impact of gender, [Dolan et al. \(2019\)](#), [Zhang et al. \(2020\)](#), and [Lund et al. \(2020\)](#) indirectly support this relationship. Moreover, as the importance-performance map analysis showed, SNM had the highest importance, while its performance was moderate, and enjoyment value had the lowest importance and highest performance.

According to the results of this study, value co-creation is significantly impacted by all five SNM components (entertainment, interaction, trend, customization, and word of mouth). Therefore, marketers should take into account that consumer-to-consumer dialogue and communication offer consumers a different source of information and perspective and can be used to create value.

Our study also adds to previous research in a number of ways. It begins by providing a basic conceptualization of SNM and consumer purchasing patterns. Second, despite the significance of this subject for marketing and business strategy, there have been few studies that have attempted to demonstrate how social network marketing (SNM) could affect consumer purchase behavior (CPB), given the mediating role of value co-creation.

In order to promote consumer-brand engagement through active participation in the value co-creation process, marketers should develop social media marketing strategies and encourage consumers to create unique benefits for the brand and for themselves. Businesses should increase their social media capabilities because users can share and work together to

innovate. The evolution and co-creation of value between businesses and their customers can then be facilitated by this innovation management process.

Client benefit Co-creation offers several advantages, including a longer relationship with customers, lower costs, and a greater capacity for innovation. Because of this, companies should encourage customers to anticipate how they will perceive the good or service they have jointly developed.

6. Conclusions

Given the mediating role of value co-creation, the main objective of this review was to identify and analyze the relationship between social network marketing (SNM) and consumer purchase behavior (CPB). PLS-SEM and NCA methods were combined to carry out the experiment. In the contemporary business world, marketing experts realize that social media is one of the most important marketing tools, making it crucial to understand the role played by SMM in the co-creating value process. The NCA results show that these results are intriguing and that, after reaching the 50% bottleneck point, more focus should be placed on relational value co-creation and SNM.

This study is unique in that it examines the impact of SNM on value co-creation and CPB using a different research methodology and approach. Researchers and practitioners can improve CPB through SNM and value co-creation by using the findings of this study, which offer new insights into what influences CPB.

As the importance of customers as co-creators of value, managers should manage customers as a human resource, almost as if customers are their employees. Managers can provide customers with gifts and discounts to encourage them to co-create value. Also customers need to benefit on the basis of the extent to which they engage in value co-creation. For the users who are already engaged, it is recommended that companies incentivize users to engage in a positive manner allowing a larger community activation to occur as a whole

Upcoming investigators could study the NCA results to show how the model might work in several contexts. Moreover, experts and companies could do related research for studying the possible effects.

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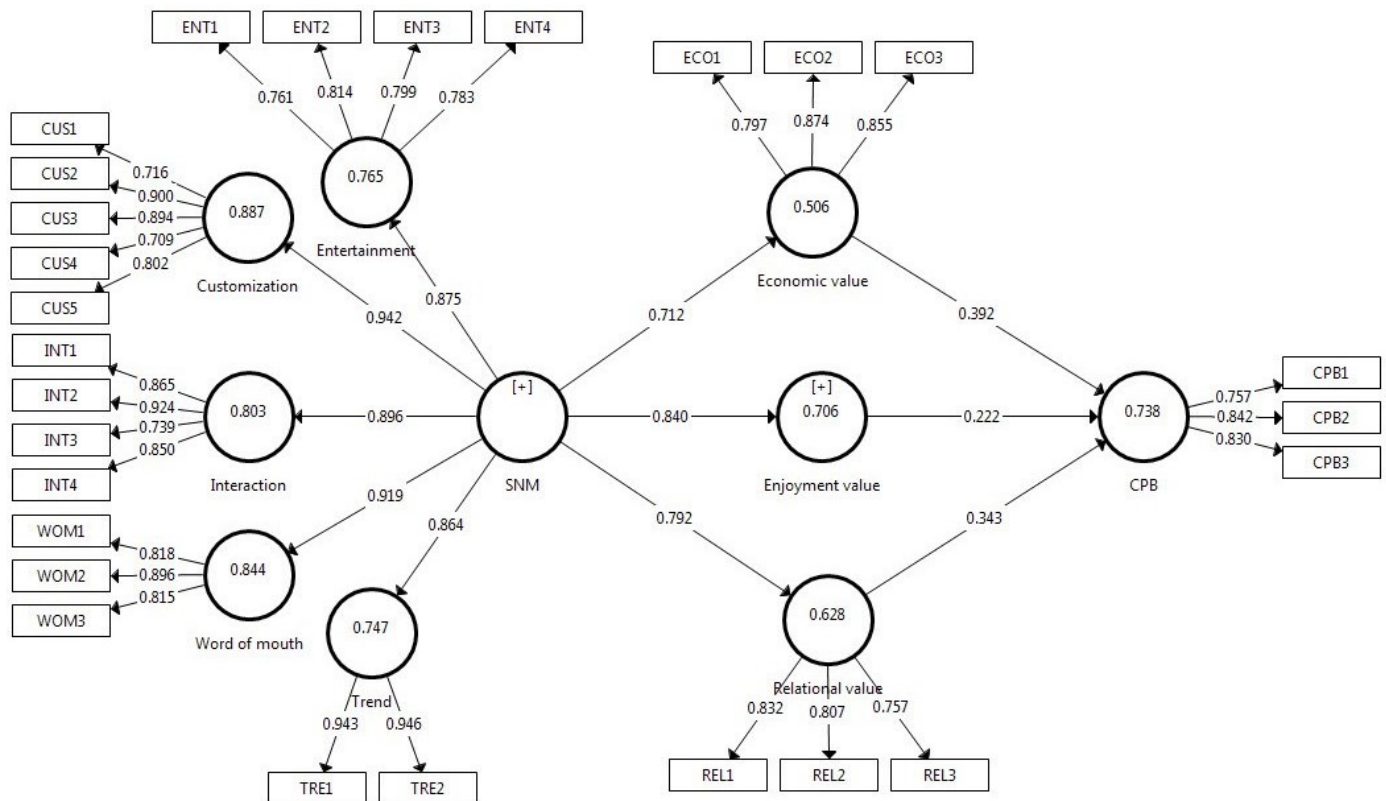
Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

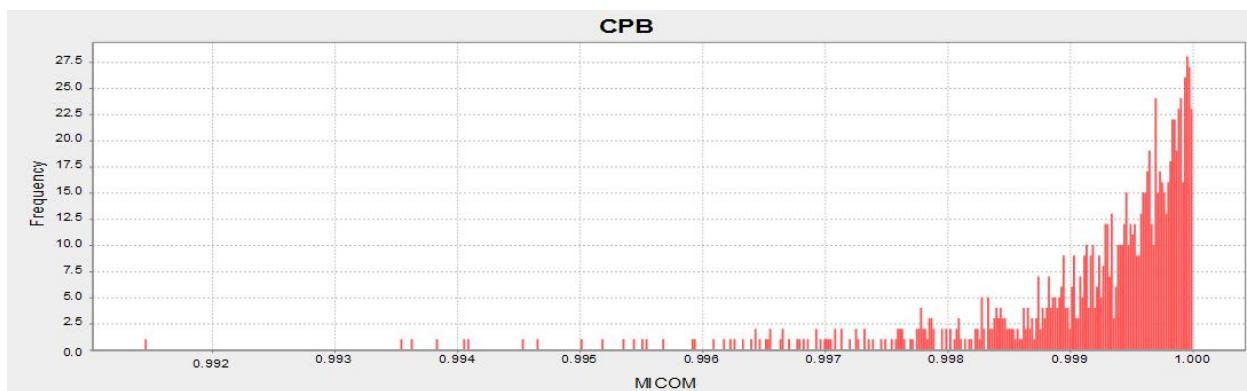
Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.

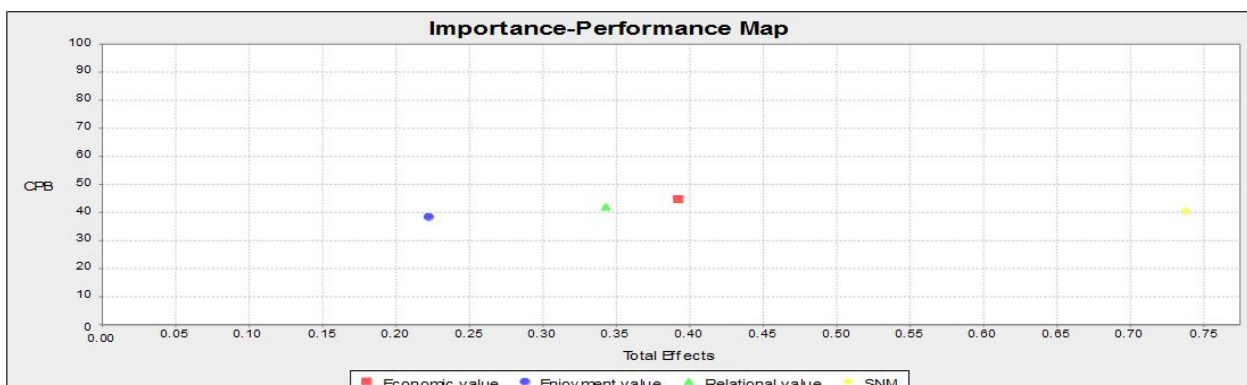
Appendix A. Path Coefficients Model (Black and White Model)



Appendix B. MICOM Plot of CPB



Appendix C. IPMA Matrix with Target of CPB



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