

SUMMARY OF THESES

Katona Ádám

The impact of customer involvement on innovation outcomes
of doctoral (PhD) dissertation

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1. BACKGROUND TO THE RESEARCH AND JUSTIFICATION OF RESEARCH TOPIC

External knowledge—that derives from outside the company actors—is a particularly valuable element of the firm’s knowledge asset, as it brings insights into the company that are unique and often not available within the boundaries of the firm (Mintzberg, 1983). Customers are unique sources of external knowledge, as they are those stakeholders whose willingness to pay over the firms’ goods determines the business performance of a company. Customers are willing to pay for products if those meet their needs and desires. To make a product meet customer expectation firms need to understand their own customers, in which external knowledge from customers plays a pivotal role (Chichkanov, 2021).

The role of customers has dramatically changed in recent years. As part of this paradigm shift, firms tend to less see customers as mere source of information, but increasingly as partners and co-creators, especially in the process of innovation (Prahalad and Ramaswamy, 2004). For example, Sony developed its PlayStation 2 in collaboration with customers, and the Lego Group involves customers in innovation processes (Saldanha et al., 2017). In the business-to-business (B2B) sector, Boeing develops new aircraft models with airline carriers by incorporating customer representatives in its new product development (NPD) team and Hilti develops innovative construction tools by collaborating with its customers (Cui and Wu, 2016). As recent Deloitte (2021) report summarizes, firms can stay ahead of the competition by engaging customers by means of customer involvement at its deepest levels.

Given the recognized relevance of customer involvement (hereinafter CI) in innovation, first I define the concept of CI and distinct it from related, but different concepts, presented in section conceptual background and theoretical positioning. Then I provide a systematic literature review of studies with the aim of enriching the domain of external knowledge management theory and practice. Finally I present a large-scale empirical study on the effect of CI on innovation outcomes under various contingencies.

Based on the integration of the extant definitions, I conceptualize customer involvement along four key definitional elements, as the firm's (1) intensive, frequent and bidirectional collaboration with the (2) customers, initiated and encouraged by the firm, in order to (3) cultivate valuable customer knowledge (4) for improved innovation outcomes at various stages of the new product development. Customer knowledge from CI forms a specific part of the company's entire knowledge base. It represents knowledge from and about an external stakeholder within the firm's knowledge base. In terms of source, the firms' knowledge may derive from within the boundaries of the focal firm, such from employees or from the firm's information technology systems. Yet, some of the firms' knowledge derives directly from external stakeholders such as consulting firms, market researchers, suppliers, or directly from customers—this body of knowledge is acknowledged as external knowledge.

I further specify knowledge by adding another dimension, content of knowledge. In terms of content, knowledge can be internal or external. Internal knowledge focuses on processes, individuals, firms, relationships within the firm, whereas external knowledge on stakeholders outside the company. External stakeholders are individuals, firms, organizations, systems—customers, suppliers, competitors, regulatory bodies, authorities—that affects or can be affected by a firm's actions.

Recent years saw a surge of new practices that are changing the role of customers in innovation. According to the traditional approach, customers are solely subject to the extraction of economic value, who needs to be persuaded to buy by means of unidirectional flow of communication. This approach, however has been shifted towards a more complex view which suggests customers are also value co-creators, co-designers of innovative solutions, co-producers of value propositions, and co-developers of valuable knowledge (Prahalad and Ramaswamy, 2004). This transformation has also given rise to a proliferation of research organized around how firms interact and share resources with customers, and other stakeholders. It is therefore important to conceptually distinguish CI from the related, but different concepts.

CI typically takes the form of a bidirectional, collaborative mode (e.g., Anning-Dorson, 2018). Some scholars, however, also refer to forms of CI in which customers are regarded as sources of information in contrast to more collaborative forms of involvement (e.g., Cui and Wu, 2017). Customer co-creation is by definition an active, creative and

social collaboration process between the firm and customers during the innovation, facilitated by the company (Piller and Walcher 2006), therefore, it is difficult to draw a sharp boundary line between the two concepts. The term co-creation may refer to a somewhat more active contribution than CI, which may also take a more passive form. Based on these arguments, I conceptualize co-creation as a subset of CI. The rest of the concepts are either broader, or different from CI.

2. RESEARCH METHODOLOGY

2.1. Study I: Systematic literature review

For the systematic literature reviews I followed the well-developed guidelines of Tranfield et al. (2003). my methodological procedure has three stages, (1) identification of potentially relevant papers, (2) relevancy identification and detailed coding of relevant papers, and (3) analysis of relevant papers.

2.1.1. Identification of potentially relevant articles

As a first step of the systematic literature review, I identified the potentially relevant papers. I conducted search using search strings “customer co-creation” OR “customer involvement” AND “innovation” OR “NPD” OR “new product development” OR “new service development”. For complete coverage, I used two databases, Scopus and Web of Science, widely used in systematic literature reviews. In order to surely capture every single potentially relevant paper. I also run queries for alternative search strings (for the alternative search strings, I only checked survey types of studies). The searches performed resulted in a total of 752 potentially relevant papers, which I checked one by one.

2.1.2. Relevancy identification and detailed coding of relevant papers

Considering the lack of uniform conceptualization of customer involvement in the existing literature, I needed to pay special attention to identifying relevant papers. I established detailed inclusion and exclusion criteria that I fine-tuned as I discussed articles that were in doubt. After the exclusions, 26 of the 752 potentially relevant articles were identified as relevant.

2.1.3. Analytical procedure

This research results into (1) the overview and comparison of prior definitions and measurement of CI; (2) the overview of measurement of innovation outcomes; (3) the presentation of the effect CI has on innovation; and (4) the presentation of how CI exerts its effect on innovation outcomes. I used the iterative grouping, a procedure during which the units of the pool are reviewed one by one and similar elements are categorized. The purpose of the procedure is to create well-separable categories, while all units within the pool can be classified into one of the categories.

2.1.4. New definition of customer involvement

As a result of my systematic literature search, I created an updated new customer involvement definition, which was needed because previous definitions did not cover the full spectrum of the phenomenon.

According to the new definition, customer involvement is a firm's (1) intensive, frequent, and bidirectional collaboration (2) with customers, as initiated and encouraged by the firm, (3) to cultivate valuable customer knowledge and (4) to improve outcomes at various stages of the innovation. Table 1 not only contains the new definition but also provides some example definitions from prior studies. The rest of the chapter explains how I created the new definition. Prior definitions have partially addressed these aspects, but as the exemplary definitions illustrate, in many cases, essential definitional elements are ignored, such as the notion that customer involvement is initiated by the firm at various stages of the innovation process.

Table 1: Exemplary definitions of customer involvement and an integrated new definition

Definition of customer involvement
<i>Integrated new definition</i>

Customer involvement is the firm's (1) intensive, frequent and bidirectional collaboration (2) with customers, as initiated and encouraged by the firm, (3) to cultivate valuable customer knowledge and (4) to improve outcomes at various stages of the innovation.

Exemplary prior definitions

- Customers' active contribution to the development of new products, for instance, by suggesting innovative ideas for new products or testing developed prototypes (Keszey & Biemans, 2016)
- Both the breadth and depth of the customer participation in the firm's new product development (NPD) (Anning-Dorson, 2018)
- The extent to which service producers interact with current (or potential) representatives of one or more customers at various stages of the new service development process (Carbonell, Rodríguez-Escudero, & Pujari, 2009)

Source: own compilation

2.1.5. New suggestions for operationalization and measurement

The following parts of this section show the items used to measure customer involvement and quotes from prior definitions. The definitional elements and measurement items are organized around the four definitional elements and provide credit for the necessity of adding each element to the definition.

As Table 2 shows, for example, in the relational aspects (1) of intensive, frequent and bidirectional collaboration, it can be seen that many researchers emphasise the active involvement of customers in the measurements, such as “our customers were *actively* involved in a variety of product designs and development activities” (Anna Shaojie Cui & Wu, 2017) or “customers were *actively* engaged with this project” (Storey & Larbig, 2018). In a similar vein, frequency also appears recursively in definitions, such as “the transfer of information about customers' needs and preferences took place *frequently*” (Anna S Cui & Wu, 2016) or the “the *frequency* of the meetings with customers was high (Carbonell et al., 2009)”.

Table 2: Measurement of the nature of collaboration with customers in the scales used for capturing customer involvement

Customer involvement definitions and items used to capture the nature of collaboration with customers
<p><i>Prior definitions</i></p> <ul style="list-style-type: none"> • <i>Frequent, bidirectional, and face-to-face</i> customer communication process (Gustafsson, Kristensson, & Witell, 2012) • <i>Dialogue, mutual influence, and understanding</i> of customers rather than one-way listening (Hsieh & Hsieh, 2015) • Brings <i>different parties</i> together (i.e., a group of customers) (Tseng & Chiang, 2016) • <i>Direct interaction and engagement</i> of the customer (Anning-Dorson, 2018) • Customers <i>actively</i> contribute to the development of new products (Keszey & Biemans, 2016)
<p><i>Measurement items</i></p> <p><i>Intensity</i></p> <ul style="list-style-type: none"> • Our customers were <i>actively</i> involved in a variety of product designs and development activities (Anna Shaojie Cui & Wu, 2017) • <i>Active</i> customer involvement (Gustafsson et al., 2012) • Customers were <i>actively</i> engaged with this project (Storey & Larbig, 2018) • There were <i>extensive</i> consultations with customers (Carbonell et al., 2009) <p><i>Frequency</i></p> <ul style="list-style-type: none"> • The transfer of information about customers' needs and preferences took place <i>frequently</i> (Anna S Cui & Wu, 2016) • Our customers <i>frequently</i> interacted with the new product team during the development process (Anna S Cui & Wu, 2016) • Our customers provided <i>frequent feedback</i> and input on product designs (Anna S Cui & Wu, 2016) • The <i>frequency</i> of the meetings with customers was high (Carbonell et al., 2009) • Our key customers are involved in <i>periodically</i> reviewing operations with us (Lin, Chen, & Chiu, 2010) <p><i>Bidirectionality</i></p>

- The major customer was an *integral part* of the design effort for the new product development (Feng & Wang, 2013; Kang et al., 2020; Li, Li, Feng, & Xu, 2019)
- We *partnered* with major customers for developing a new product (Feng & Wang, 2013; Li et al., 2019)
- To reduce lead time, I have focused on *collaboration* (Gustafsson et al., 2012)
- This product was developed in close *co-operation* with a potential or current main customer (Stendahl, 2009)
- Specific customers were *invited* to join the project as team members (Carbonell et al., 2009)
- A high degree of *face-to-face* communication (Gustafsson et al., 2012)

Initiated and encouraged by the firm (aspect neglected in the definitions)

- My company *encourages* customers to express their opinions on my services on social media (e.g., Facebook, Twitter, LinkedIn) (Mitrega, Spacil, & Pfajfar, 2020)
- We always *encourage* my customers to help us in the production of quality service (Anning-Dorson, 2018)
- Our employees are *encouraged* to monitor the internet to search for customer opinions on my company (Mitrega et al., 2020)

Source: own compilation

Table 3 presents the definitional elements and the measurement items of the knowledge aspect. As seen from the definitional elements, in the case of customer involvement, the exchange value is knowledge itself. However, the measurement items also draw attention to two important aspects, which have been neglected in the definitions. On the one hand, knowledge sharing is not one-way. This notion is reflected by (Hsieh & Hsieh, 2015) who suggests using the item “we explain the ideas in a meaningful way to customers” or by (Tseng & Chiang, 2016) who measure customer involvement by asking respondents to evaluate the extent to which firms “Provide customers with professional knowledge in fields with which they are not already familiar”.

Table 3: Definition and measurement of the knowledge aspect in the scales used to capture customer involvement

Customer involvement definitions and the items used to capture the knowledge aspect of collaboration with customers
<i>Knowledge aspects in prior definitions</i>
<ul style="list-style-type: none"> • Customers providing <i>feedback, information, and knowledge</i> to firms (Menguc et al., 2014) • Suggesting <i>innovative ideas</i> for new products or testing developed prototypes (Keszey & Biemans, 2016) • Creative <i>problem solving</i> (Gustafsson et al., 2012)
<i>Knowledge aspects in measurement items</i>
<i>Knowledge sharing of the firm with customers (aspect neglected in the definitions)</i>
<ul style="list-style-type: none"> • We explain the ideas in a meaningful way to customers (Hsieh & Hsieh, 2015) • Provide customers with professional knowledge in fields with which they are not already familiar. (Tseng & Chiang, 2016) • We actively provide information to reply to customers' suggestions (Hsieh & Hsieh, 2015)
<i>Knowledge gained by firms from customers</i>
<ul style="list-style-type: none"> • We always gather market insights from customers through face-to-face customer meetings, visits, workshops, or customer suggestions (Anning-Dorson, 2018)
<i>Cultivate customers as valuable sources of external knowledge (aspect neglected in the definitions)</i>
<ul style="list-style-type: none"> • Our customers' involvement as codevelopers of the product was <i>significant</i> (Anna S Cui & Wu, 2016) • Customers give <i>lots of feedback</i> for the new ideas (Hsieh & Hsieh, 2015) • NPD is governed to a <i>large extent</i> by customer feedback (Keszey & Biemans, 2016) • We used customers as a <i>key information</i> source (Anna Shaojie Cui & Wu, 2017) • Our key customers have a <i>major influence</i> on the design of new products (Feng, Sun, Zhu, & Sohal, 2012) • Communication and interaction leading to <i>novel</i> ideas (Gustafsson et al., 2012)

Source: own compilation

Table 3 depicts the definitional elements and the measurement items of the innovation outcome aspect. As the definitions show, the core aim of customer involvement is to reach enhancements of innovation outcomes. This notion is further illustrated in the items used for measurement. Specifically, several studies emphasise the stage of customer involvement. For example, when measuring customer involvement, (Melton & Hartline, 2015) ask whether customers were involved in the design stage, while, for example, (Storey & Larbig, 2018) focus on whether customers were involved at every stage of the innovation project. These measurement items show that customer involvement might play a role at various stages, and this could also be reflected in the new definition.

Table 4: Definition and measurement of the innovation outcome aspect in the scales used to capture customer involvement

<i>Outcome aspect of customer involvement (for improved outcomes at various stages of the innovation)</i>
<i>Outcome aspect in prior definitions</i>
<ul style="list-style-type: none"> • The extent to which service producers interact with customers at <i>various stages of the innovation process</i> (Carbonell et al., 2009) • Leverage customer communication and enable this communication to be transformed into input into <i>[service] innovations</i> (Mitrega et al., 2020) • Manufacturers incorporate their customers into their <i>product development and continuous improvement</i> programs (Feng et al., 2014) (Yang & Zhang, 2018) • Breadth and depth of the customer participation in the <i>firm's innovation</i> (Carbonell, Rodriguez-Escudero, & Pujari, 2012)
<i>Outcome aspect in the measurement items</i>
<i>Stages</i>
<ul style="list-style-type: none"> • We <i>consulted</i> major customers <i>early</i> in the design efforts for the new product (Feng & Wang, 2013) • Customers were involved early in the development process (Gustafsson et al., 2012)

- To what extent were customers involved in the design stage? (Melton & Hartline, 2015)
- Customers were involved at every stage of the project (Storey & Larbig, 2018)

New product development

- There is a strong consensus in my firm that customer involvement is needed in *product design/development* (Feng et al., 2012; Yang & Zhang, 2018; Huiying Zhang & Yang, 2016; Zhao, Feng, & Shi, 2018)
- We used information about my customers' needs in the *development of the new product* (Anna S Cui & Wu, 2016)
- We utilized *product designs* that were created by my customers (Anna S Cui & Wu, 2016)
- Our customers' involvement constituted a significant portion of the *overall product development* effort (Anna Shaojie Cui & Wu, 2017)
- Our *project team* acted on data from customers (Haisu Zhang & Xiao, 2020)

Source: own compilation

2.1.7. Conceptual clarification and distinction of Customer involvement from related concepts

After having discussed the definition of customer involvement, I want to distinguish customer involvement from related but different concepts and then include customer co-creation, customer integration, crowdsourcing, value co-creation, open innovation and customer participation.

Table 5: Conceptual distinction of customer involvement

Concepts	Definitional elements			
	1 ^a	2 ^b	3 ^c	4 ^d
What is customer involvement?				
Customer involvement: the firm's (1) intensive, frequent and bidirectional collaboration (2) with customers, as initiated and encouraged by the firm, (3) to cultivate valuable customer knowledge and (4) to improve outcomes at various stages of the innovation.	yes	yes	yes	yes

What customer involvement is not?				
Narrower concept than customer involvement				
Customer co-creation: an active, creative, and social collaboration process between the firm and customers during the innovation, as facilitated by the company (Piller & Walcher, 2006)	yes	yes	yes	yes
Broader concepts than customer involvement ^e				
Customer integration: the <i>combining</i> of customer <i>resources</i> (persons, possessions, nominal goods, or personal data) with the company resources to transform customer resources (Moeller, 2008)	yes	yes	nlt ^f	nlt
Crowdsourcing: a type of <i>participative online</i> activity in which an individual, an institution, a non-profit organization, or company proposes to a <i>group of individuals</i> of varying <i>knowledge</i> , heterogeneity, and number, via a flexible open call, the voluntary undertaking of a variety of tasks (Estellés-Arolas & González-Ladrón-de-Guevara, 2012)	yes	nlt	yes	nlt
Value co-creation: a joint, <i>collaborative</i> , concurrent, peer-like process of co-creating new <i>value</i> through <i>customer experience and competence</i> . Value creation is an <i>all-encompassing</i> process that includes provider and customer activities (design, delivery, manufacturing, delivery, and usage) (Grönroos, 2011)	yes	yes	nlt	nlt
Open innovation: a distributed <i>innovation</i> process based on purposively managed <i>knowledge</i> flows with a <i>variety of actors</i> across organizational boundaries that uses pecuniary and nonpecuniary mechanisms in line with the organization's business model (Chesbrough, Vanhaverbeke, & West, 2014)	yes	nlt	yes	yes
Different from customer involvement but related concepts				
Customer participation: the degree to which the <i>customer is involved</i> in <i>producing</i> and <i>delivering</i> the service (Dong, Evans, & Zou, 2008)	nlt	yes	nlt	no
Value in use: a joint, <i>collaborative</i> , concurrent, peer-like process of co-creating new value through <i>customer experience and competence</i> . Value in use co-creation is limited to creating value during the customers' <i>usage</i> of the product (Grönroos, 2011)	yes	yes	nlt	no
Value co-destruction: an interactional process between service systems that results in a decline in at least one of the systems' well-being (Plé & Chumpitaz, 2009)	yes	yes	nlt	no

^a Intensive, frequent collaboration; ^b With customers; ^c Customer knowledge; ^d New product development, innovation; ^e Concepts are identified as broader if at least one of the definitional elements may contain but typically focuses on a broader scope; ^f Not limited to/not focal

Source: own compilation

As Table 5 posits, customer involvement can be differentiated from these concepts along with the four definitional elements that I identified by investigating prior studies (see the previous section). These elements refer to (1) intensive collaboration (2) with customers that (3) brings in customer knowledge (4) with the aim of new product

development. I start with customer co-creation, which is a subset of customer involvement. Customer involvement typically takes the form of a bidirectional, collaborative mode (e.g., Anning-Dorson, 2018). Some scholars, however, also mention forms of customer involvement in which customers are only regarded as sources of information in contrast to more collaborative forms of involvement (e.g., Anna Shaojie Cui & Wu, 2017). Customer co-creation is, by definition, an active, creative, and social collaborative process between the firm and customers, as facilitated by the company (Piller & Walcher, 2006). Therefore, it is not easy to draw a sharp boundary line between the two concepts. The term co-creation may refer to a more active contribution than customer involvement, which may also take a more passive form. Based on these arguments, I conceptualize co-creation as a subset of customer involvement.

I consider customer integration, crowdsourcing, value co-creation, open innovation, and customer participation as broader concepts than customer involvement. For example, as the crowdsourcing definition suggests, it is a type of *participative online* activity in which an individual, an institution, a non-profit organization, or company proposes to a *group of individuals* of varying *knowledge*, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a variety of tasks (Estellés-Arolas & González-Ladrón-de-Guevara, 2012). Therefore, crowdsourcing differs from customer involvement in the sense that crowdsourcing is not limited to the exchange of value with customers; moreover, crowdsourcing may also involve “crowds” who are not the customers of the firm and may include other stakeholders, such as individuals, institutions, non-profit organizations. In a similar vein, value co-creation is also conceptually different from customer involvement, as it is defined as a joint, *collaborative*, concurrent, peer-like process of co-creating new *value* through *customer experience* and competence. Value creation is an *all-encompassing* process that includes provider and customer activities (design, delivery, manufacturing, delivery, and usage) (Grönroos, 2011). Accordingly, value co-creation aims to exchange a variety of resources beyond customer knowledge as customer involvement suggests, with the aim of creating new value, which may not necessarily be limited to innovation.

Table 5 presents customer participation as an example of a concept different from customer involvement. Specifically, customer participation is defined as the degree to which the *customer* is *involved* in *producing* and *delivering* the service (Dong et al., 2008); thus, customer participation focuses on the production and delivery process, not

the innovation process. Similarly, value in use differs from customer involvement in the sense that it is limited to creating value during the customers' *usage* of the product (Grönroos, 2011), not during the process of innovation, as customer involvement suggests.

2.2 Study II: Empirical research

2.2.1 Conceptual framework and hypotheses

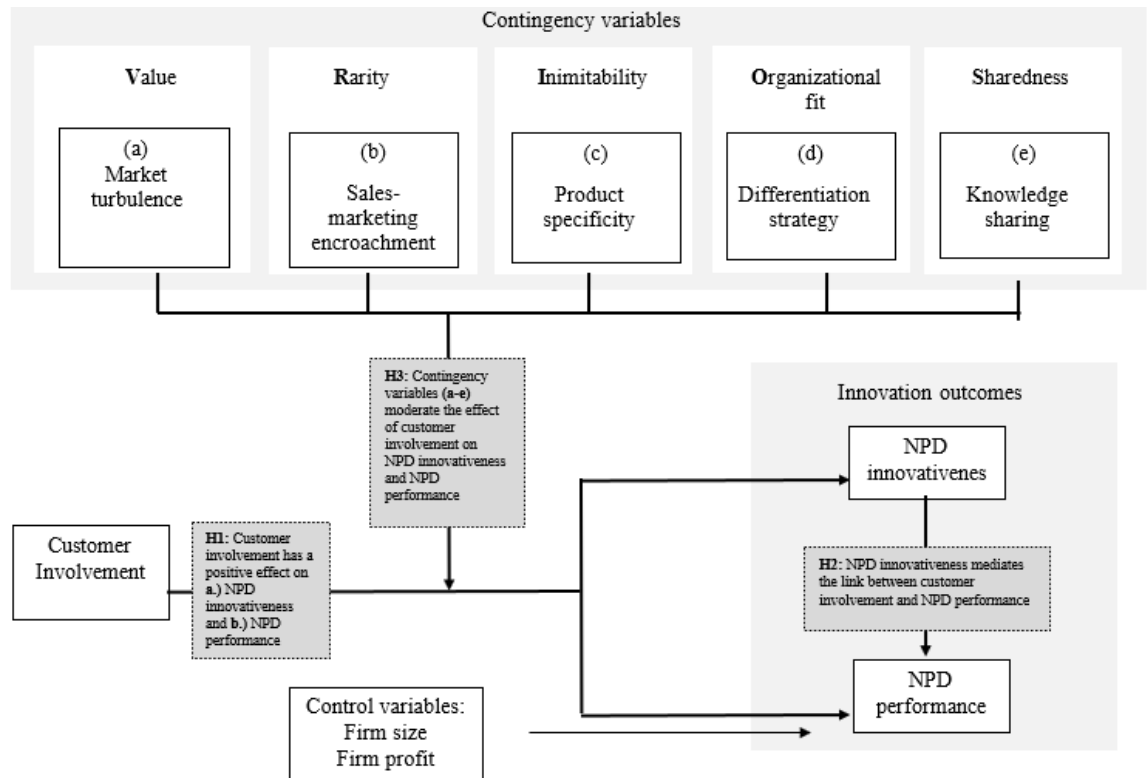
The aim of this research is to better understand how and when CI leads to innovation outcomes. As the systematic literature review reveals, although the link between CI and innovation is well established, less is known about the boundary conditions of this link. Moreover, as I demonstrated in the systematic review of the prior literature, the previously investigated moderator variables are to large extent sporadic in the prior papers and are not organized around a well-established theoretical ground.

Against these backdrops, I aim to investigate the boundary conditions that may alter the effect of CI on innovation. The theoretical lens I am opting for choosing the moderator variables is the Resource Based View of the firm, specifically the VRIO framework, which includes four conditions, Value, Rarity, Inimitability, Organizational fit for assessing whether a resource, in my case the knowledge from CI, has the potential to generate sustainable competitive advantage, in my study, innovation outcomes (Kozlenkova et al., 2014, Barney, 1991). I amend this framework with another characteristics of strategic importance, Sharedness – a concept that I highlight while presenting the hypotheses.

This proposition, and my conceptual framework (Figure 1) rely on the preliminary assumption that CI contributes unique resource to the firm, external customer knowledge from the customers directly (Gustafsson et al., 2012, Prahalad and Ramaswamy, 2004). Based on the RBV, as a theoretical lens, I posit, that the extent to which external knowledge gained by CI contributes to innovation outcomes depends on its value, rarity, inimitability and organizational fit (see the VRIO framework (Barney, 1995, Barney, 1991)). Following the approach of Bommaraju et al. (2019), I do not measure the elements of the VRIO framework directly, instead use proxy variables to capture the four aspects of the VRIO. These variables, and their relationship and representation of the VRIO

framework is explained in a detailed manner in the following sections about the hypotheses.

1. Figure



Source: own compilation

2.2.1.1 Direct and mediating hypotheses

H1a: CI has a positive effect on NPD innovativeness

H1b: CI has a positive effect on NPD performance

H2b: NPD innovativeness mediates the link between customer involvement and NPD performance

2.2.1.2 Moderating hypotheses

Hypotheses about the moderation mechanisms related to the VRIO (Value, Rarity, Inimitability and Organizational fit) framework are formulated in relation to the well-established link between CI and the novelty of innovation. I use proxy variables to capture

the degree to which CI meets the VRIO criteria. Specifically, we, for example, do not measure the extent to which CI is perceived to be valuable by the firm, instead, I posit that market turbulence is a variable that serves as a proxy for capturing the value of a firm-level resource. The following section presents the moderating hypotheses according to the acronyms of the VRIO framework.

Value

H3a: Market turbulence positively moderates the positive effect of CI on the novelty of innovation.

Rarity

H3b: Sales-marketing encroachment negatively moderates the positive effect of CI on the novelty of innovation.

Inimitability

H3c: Product specificity positively moderates the positive effect of CI on the novelty of innovation.

Organizational fit

H3d: Differentiation strategy positively moderates the positive effect of CI on the novelty of innovation.

Sharedness

H3e: Knowledge sharing negatively moderates the positive effect of CI on the novelty of innovation

2.2.4 Data gathering, screening and analysis

The data for my thesis were collected through a mail survey that was sent to firms operating in Hungary. The business information database of the Hungarian Central Statistical Office was used and selected firms that belong to the top ten percent of firms in terms of sales revenue, as reported in the quarterly (please note that data for this research was collected by an OTKA research of my Ph.D. supervisor, Prof. Tamara Keszey, project number PD77726).

Altogether, 2500 questionnaires were sent out by mail with an alternative option of filling out the questionnaire online. In order to improve the response rate, follow-up phone calls were made. These phone calls gave the opportunity to inquire whether the questionnaire had reached the competent key respondent and to gain further insights about the causes of potential non-response. Respondents were ensured of the confidentiality of their data.

The data collection resulted into 296 usable responses (response rate of 11.8%). Companies in the sample represent a great variety of industries. The key informants for the survey are marketing executives and marketing managers, who are typically top managers or one level below top management, supposedly with decision-making authority and with a mean company-specific experience of 12.1 years.

As these analyses show, all Cronbach alpha measures are above the 0.7 threshold. Measurement presents the means (ME) and standard deviations (SD) for the scales used for measurement related to the assessment of construct reliability. Composite reliability (CR) measures are higher than the .70 threshold (Nunnally, 1967), which indicate good reliability of the constructs, while the average variance extracted (AVE) is also greater than the cut-off value of .50 for each scales (Bagozzi and Yi, 1988). These tests confirm the convergent validity of the measures. The correlation between two constructs is less than the square root of AVE, indicated on the diagonal, signalling discriminant validity (Fornell and Larcker, 1981).

2.2.5 Modell testing

Following the mainstream of the CI research trend (e.g., Zhang and Xiao, 2020b, Morgan et al., 2019), I examine the empirical part of my research by means of Structural Equation Modelling, as this is the mainstream in this body of literature as my systematic literature review has also shown.

The fit indices suggest that the model fits the data very well ($\chi^2(127)=324.48$; $\chi^2/df=2.55$; $p<.001$; RMSEA=.073; SRMR=.05; NNFI=.94; and CFI=.95). The results, summarized in Table 16, show that CI has a direct effect on NPD innovativeness ($\beta =.609$, $p<.001$), but it has no direct effect on NPD performance ($\beta =.135$, ns), providing support for H1ab, but not for H1b. NPD innovativeness is positively related to NPD performance

($\beta = .433$, $p < .001$), this relationship however is not formulated in form of a direct relationship. I controlled for two variables, firm net income and firm size have no direct significant effect on NPD innovativeness ($\beta = .195$, n.s.; -0.04 , n.s., respectively) and on NPD performance ($\beta = .06$, n.s.; 0.02 , n.s., respectively).

To test whether NPD innovativeness mediates the relationship between CI and NPD performance, the approach of Zhao et al.'s (2010) was used. Their methodology suggests using bootstrapping to investigate the significance of indirect effects. I applied 5000 bootstrap resamples. According to Zhao et al.'s (2010) approach, an indirect effect is significant, therefore the mediation is established if the bootstrap confidence interval of an indirect effect does not include zero (Preacher and Hayes, 2008, Zhao et al., 2010). The result of the bootstrap mediation analysis shows that CI a significant total effect on NPD performance ($\beta = .386$, $p < .001$), however, the direct effect is insignificant ($\beta = .135$, n.s.), while the indirect effect through NPD innovativeness is significant ($\beta = .251$, $p < .001$), suggesting full mediation and providing support for H2.

To test my hypothesized moderating effects, I created interaction terms by the case-wise multiplication of the underlying standardized construct scores for the independent and moderator variables (Collier, 2020, Byrne, 2010). Both the moderating latent variable and the interaction terms were then included in AMOS 27.0. My results in Table 16 demonstrate that the moderating effect of market turbulence is insignificant on the link between CI and NPD innovativeness ($\beta = .02$, n.s.), leading me to reject H3a. Similarly, I found that sales-marketing encroachment does not moderate the effect of CI on NPD innovativeness ($\beta = -.09$, n.s.); thus, H3b is also rejected. The moderating effect of product specificity is also insignificant, leading me to reject H3c ($\beta = .00$, n.s.). Differentiation strategy positively moderate the effect of CI on NPD innovativeness ($\beta = .10$, $p < .05$), while knowledge sharing negatively moderate this investigated link ($\beta = -.12$, $p < .01$).

3 RESULTS

3.1 New insights on the impact of customer involvement on new product outcomes

My research investigates the effect that CI has on innovation outcomes. Specifically, in my research, based on my own typology of innovation-related outcomes of CI, namely, (a) innovation-process related outcomes, (b) financial outcomes and (c) customer perception of new products, this research looks at the latter two. This is a theoretically incremental novelty, as many previous studies examine only one type of innovation outcome as a result of CI, for an exception, see Yang and Zhang (2018) or Tseng and Chiang (2016). According to my findings, CI has a direct positive effect on NPD innovativeness. This result is not surprising, considering that prior studies reached the same conclusion. For example, Cui and Wu (2017) show that no matter how a firm involves their customers, for example, as pure source of information or as co-creators, the innovation outcomes will be more novel. In a similar vein, Kang et al. (2020) also reveal that CI has a positive effect on product innovativeness. My results show that the direct effect of CI on NPD performance is not directly positive. Although this result seems to be somewhat counter-intuitive, number of prior studies reveal that the effect of CI on NPD performance is not straightforward. For example, several studies conclude that CI does not directly lead to better innovation-related financial outcomes (Feng and Wang, 2013, Zhang and Yang, 2016).

3.2 New insights on the impact of customer involvement on financial performance

My research aids the better understanding of how and along what value chain CI leads to better financial performance. (Feng and Wang, 2013, Zhang and Yang, 2016) empirically shows that a CI leads to innovation performance indirectly, through NPD cost and speed. Morgan et al. (2019) reach a similar result, however, according to their findings CI has a direct effect on NPD performance, and an indirect one through NPD speed.

Hence, these results theoretically imply that involving customers speed up the NPD process, and lead to cost reductions. My results propose an alternative route, namely, I show that involving customers lead to better NPD performance by products that are

being perceived as more novel by the customers. My findings suggest that the path between customer involvement and financial performance is not directly proportional. Customers can give insights on how, in what cases they find the product more attractive, how to shorten the innovation path, what unnecessary mistakes a company should avoid during product development that slows down innovation. An important result is that they are likely to be less able to provide useful information about what affects the financial success of an innovation, such as pricing or distribution channel decisions. Nevertheless, CI pays off financially, but the impact is not direct, this is important for decision makers to keep in mind.

3.3 Theoretically embedded examination of the role of contingents

Although previous research has shown that the CI innovation performance link may be exposed to contingencies, the selection of moderating variables in previous research was quite ad-hoc. Against this backdrop my study organized the investigated moderating variables according to the broader theoretical framework of the VRIO (Barney, 1991). My results imply that market turbulence, which induce that customers are unpredictable, their needs change quickly and hectically, and serving customers is like shooting at a constantly changing target (Jaworski and Kohli, 1993), does not erode the impact of CI on the novelty of innovation outcomes. Hence, my results show, that even in unpredictable times it pays off to include customers in the NPD process – this is an important theoretical implication especially in turbulent times, because it implies that customers and the information value, they generate evolves along the changes caused by market turbulence occurring in the external environment.

3.4 Understanding the role of sales-marketing relationship in the process of customer involvement

Previous research has not examined the relationship between sales-marketing encroachment and, more broadly, alternative ways of acquiring customer knowledge. My preliminary assumption was that close collaboration between sales and marketing weakens the effects of customer engagement. However, my empirical results did not confirm this effect. This may also be due to the fact that customers are able to provide

unique insights that cannot be replaced by customer information from sales colleagues, so there is no extinguishing effect. The optimal organization of the internal flows of customer knowledge and the exploration of the necessary knowledge can be the subject of further research.

3.5 Understanding the role of product specificity in the process of customer involvement

Product specificity has also not been investigated by prior research as an environmental contingency. I posit that when a product is customized, firms develop long-term collaborations with the customers, hence the knowledge they are able to bring into the innovation process is targeted to the focal firm. This knowledge cannot easily be mitigated by the competitor; hence it contributes to the novelty of the NPD more compared to when the product is generic. Here, too, my results confirm that customers are able to adapt very well not only to customer turbulence, but also to how specific a product a company produces, and that these external contingencies do not affect the positive value that CI adds to product development (Mitrega et al., 2020).

3.6 Empirical investigation of a novel aspect, firm strategy in the process of customer involvement outcomes

My results show that firm strategy can actually alter the effects of CI on innovation outcomes. Specifically, differentiation strategy requires an in-depth customer understanding, to be able to explore and meet customer needs in a superb level. When a high level of customer service is an important corporate priority, decision-makers add more value, more credit to the findings made by customers, which is why they are better integrated into the product development process. My results thus point to the role of senior management in the success of CI and that CI's impact is not in a vacuum but as an element of an organizational strategy. And this strategy affects how important and effective a particular tool is. This notion also appears indirectly in, for example, Cui and Wu (2016), who also demonstrate that the effect of CI is related to other strategies, specifically on technological one.

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