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RAPPORT
REPORT

The Norwegian Innovation Index
Methodological Foundations

Seidali Kurtmollaiev
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The Norwegian Innovation Index
Methodological Foundations

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FOREWORD

Sometimes you stumble across an idea that turns into an excellent idea because you can develop it with amazing people. The Norwegian Innovation Index is such a story. Four years into the Research Council of Norway-funded research center, Center for Service Innovation (CSI) at NHH, I realized that the customer's voice was missing in the discussion. Other questions were why was Norway ranked much lower than Finland, Sweden, and Denmark? Yes, Norway is “marinated in oil” but could that be the only explanation? Could it be a measurement problem and how can countries be innovative? The questions were many and answers were hard to find. I needed help.

I have known Professor Line Lervik-Olsen since she was a Ph.D. student at BI Norwegian Business School. Associate professor Seidali Kurtmollaiev I met when he was a Ph.D. student at CSI/NHH and later became a PostDoc/Associate professor at NHH. Line and Seidali are amazing people whom I admire and respect – the kind of people you go to when you need help. They found my questions intriguing and interesting and soon became the core development team of “how to best capture customers’ voice in innovation research?” Our vision was to develop something that could be useful for policymakers, industry leaders, and business leaders when forming their decisions. A challenging question was related to whether innovation, as perceived by customers, is theoretically different from perceived quality.

In the spring of 2015, we had, our eureka moment during a workshop at my cabin when we came across Werner Kunz’s article “How Does Perceived Firm Innovativeness Affect the Consumer?” Published in the Journal of Business Research (2011). Suddenly the Innovation index theory came together. Firms and customers interact in the moment of truth. This is where customers make use of the firm’s latent resources and experience changes in the market offering. Any changes materialize in the perception of how innovative they perceive the form to be. Perceived innovativeness defines how attractive or not customers perceived the firm to be. For self-interest-seeking customers, attractiveness is linked to buying or not, from a supplier, which is linked to customer loyalty, customer lifetime value, customer equity, and finally firm value.

Today, research teams from seven universities have adopted the Norwegian Innovation Index approach: Finland (Hanken School of Economics), Sweden (Karlstad Business School, Karlstad University), Denmark (Aarhus Business School, Aarhus University), Belgium (Hasselt Business School, Hasselt University), Spain (Department of Business Administration, Universidad Carlos III de Madrid), the USA (Gabelli Business School, Fordham University and Rockbridge Associates), Australia (Department of Business, Economics and Law, University of Queensland). Hopefully, in 2023 we will include VinUni in Vietnam and The Reserve Bank of India Innovation HUB in the research partnership.

For Line, Seidali, and me, meeting with these amazing researchers is truly inspiring. Being on a mission with exceptional people is what makes academic life and work a blessing. For this, we are truly thankful.

Tor – on behalf of Seidali and Line

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INTRODUCTION

"If you cannot measure it, you cannot manage it" is an old management saying. On the national level, the existing sources of systematic information on innovation efforts and innovation performance typically rely on macroeconomic indicators (e.g., Global Innovation Index, Bloomberg Innovation Index) or self-reports by managers or experts (e.g., Community Innovation Survey, Fast Company World's Most Innovative). This top-down and inside-out perspective is undeniably valuable, but it neglects the experiences and opinions of innovation recipients, i.e., customers. Ironically, innovation, by definition, requires the commercial application of a new idea, and being available on the market for customers is what distinguishes innovations from inventions.

Recognizing that it is customers' adoption and usage decisions that determine the success of new products and, ultimately, of innovators themselves, our research team at NHH – Norwegian School of Economics has developed the world's first outside-in and bottom-up approach to evaluating innovation efforts – the Norwegian Innovation Index (NII), which was launched in 2016. In our approach, we follow the customer-centric view that builds on the value creation literature, where innovation is conceptualized as a customer-perceived change in how customers and firms co-create value (Michel et al., 2008a, 2008b), with the value being the customer's overall assessment of "consequences arising from a solution that facilitate or hinder the achievement of the customer's goals" (Macdonald et al., 2016, p. 96). Customer-perceived value emerges in the value creation process that comprises three spheres: 1) the provider sphere (closed to customers), where firms produce resources to be used by customers; 2) the customer sphere (closed to firms), where customers use resources and create actual value for themselves; and 3) the joint sphere (the intersection of the provider and the customer spheres), where firms and customers co-create value, that is, together create value in interactions (Grönroos & Voima, 2013). Concerning innovation, the provider sphere functions as an arena for developing new solutions of potential value for the firm, whereas the customer sphere covers the customer's use of new solutions independently of the firm (Grönroos, 2017).

Thus, our point of departure was twofold: 1) customers—not managers or experts—are the users and thus the best judges of innovations (Gustafsson et al., 2020), and 2) the primary means of influencing the customer's perceptions of the firm's innovations and innovativeness is introducing changes in the joint sphere through the commercialization of new solutions (Grönroos, 2017; Grönroos & Voima, 2013). Through a carefully designed procedure, NII captures both firms' innovation activities and customers' perceptions of innovations. Taking up the idea that customers' assessments of a focal firm should be seen relative to other market players (Keiningham et al., 2015), we also assess how customers' perceptions of firm innovativeness guide their comparisons of competing firms. As we consistently find, perceived firm innovativeness significantly and positively affects firms' relative attractiveness on the market as well as customer loyalty. This suggests that quality which has been in focus ever since the emergence of the first satisfaction barometers (e.g., Fornell, 1992; Fornell et al., 1996) may not be enough for firm survival. In our view, quality is a ticket to play, but innovation is a ticket to stay.

We developed the conceptual NII model based on a literature review and in-depth interviews with customers. We conducted two large-scale pretests at the end of 2015 and the beginning of 2016. Since 2016, we collect our data annually. Our respondents are a nationally representative sample of the Norwegian population aged 15 years or older. The number of companies is regularly reviewed and expanded to include a broader range of industries, reflecting a greater share of Gross Domestic Product, but also emerging companies and industries. We use structural equation modeling and the software LISREL (Jöreskog & Sörbom, 2015) to test the conceptual model and create rankings of companies based on latent factor scores. In this document, we also offer alternative codes to create the rankings in R and SmartPLS. To run the model in smaller samples, e.g., for individual companies or segments, we use the software SmartPLS (Ringle, Wende & Becker, 2015).

The companies included in the survey are the major actors in the selected industries, amounting to 70 percent (or more) of the average Norwegian household spending in the industry. Both private companies and public organizations are represented in the survey. The publicly available result is the annual rating and ranking of Norwegian firms across a variety of sectors based on their innovativeness, relative attractiveness, and customer loyalty. In addition, NII allows a fine-tuned analysis of customer reactions to firms' innovation activities as well as a systematic analysis of innovation at the industry level. Although the survey originally focused only on the B2C market, it has been later developed to address the B2B market as well. In this document, we present the versions of the questionnaire addressing private companies and public organizations within the B2C market as well as private companies within the B2B market.

NII is sponsored by the Digital Innovation for Growth, a national, non-profit partner-based research center at the Norwegian School of Economics (NHH) in Bergen. Its partners include universities, research centers, telecom, fintech cluster, municipality, Government agency, insurance, logistic, retail, utilities, management consulting, and employer unions – all working in the digital innovation space. A professional bureau, Norstat Norge AS, collects the data.

THE IDEA IN BRIEF

Our point of departure is that customers - not managers or experts - are the best judges of innovations. As innovations imply changes in the joint sphere, the introduction of such changes becomes the firm's means of directly and actively influencing the customer's value creation (Grönroos, 2017; Grönroos & Gummerus, 2014). The value creation literature suggests that firms can introduce changes in the joint sphere by (1) proposing new value to customers, (2) changing how customers actualize value, (3) (re)configuring relationships with customers, and (4) (re)designing the physical/virtual space of interaction (Grönroos & Voima, 2013; Gummesson, 2007; Holmqvist et al., 2020; Michel et al., 2008b; Payne & Frow, 2014; Payne et al., 2009). These four dimensions of the joint sphere (i.e., value proposition, value actualization, relationship experience, and interaction space) address *what*, *how*, *who*, and *where* of the joint sphere and resonate well with specific dimensions that have been identified in different contexts.

The customers' perceptions of changes along the four dimensions of the joint sphere affect their perceptions of firms' innovativeness. Those firms that customers perceive as more innovative become also more attractive than their competitors and, as a result, have more loyal customers (Figure 1). By making investments in the "right" innovation areas that are appealing to customers, managers can build customer loyalty, improve customer equity, and thus increase firm value. Companies' innovativeness can be aggregated to the industry level, while the innovativeness at the industry level can be aggregated to the national level.

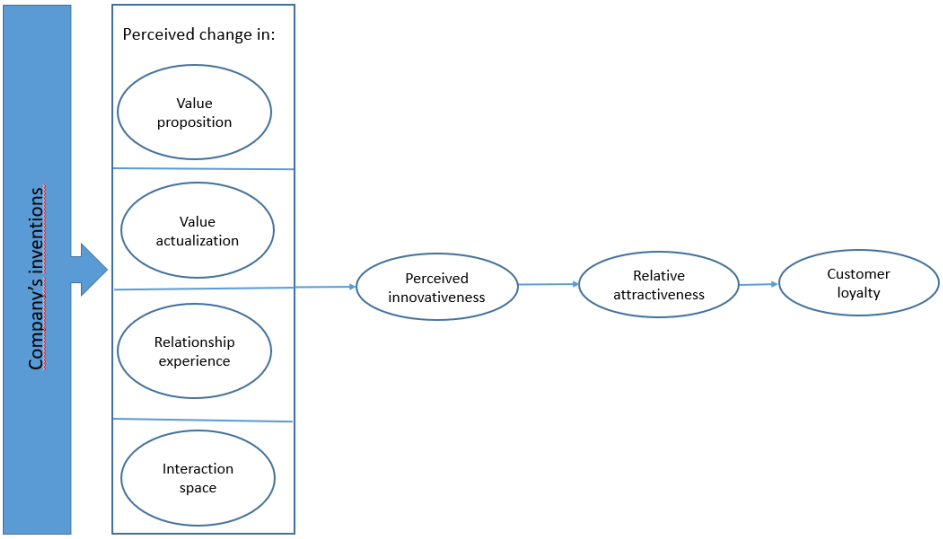

Figure 1. NII research model

Importantly, we do not make any assumptions about change valence in the joint sphere for two reasons. First, the fundamental innovation characteristics are the novelty and extent of the change, not its positive or negative outcomes (e.g., Schumpeter, 1934). Second, defining innovation as a positive change would exclude changes that customers dislike and introduce customer satisfaction as a confounding notion into the concept of innovation. Although innovations are often seen as improvements from the managerial perspective (if managers do not purposefully introduce negative outcomes or failures), this may not be the case from the customer perspective. Furthermore, it is not reasonable to expect that even when customers "uniformly" recognize a change in the joint sphere, they should also share a uniform opinion of the change's valence. Kurtmollaiev et al. (2022b) demonstrate that the perceptions of changes differ considerably both among customers and between managers and customers.

Kurtmollaiev et al. (2022a) provide a detailed explanation of the value co-creation dimensions and their relationships with perceived firm innovativeness and relative attractiveness.

Perceived firm innovativeness is the overall measure of customer perceptions of the firm's capability to innovate. To accommodate the increasing societal focus on digitalization and sustainability, we also measure customer perceptions of firms' digital innovations and social innovations as specific facets of firm innovativeness.

NII provides two different kinds of insights:

1) A ranking of Norwegian companies by the three main dependent variables in the model that is, perceived innovativeness, relative attractiveness, customer loyalty as well as digital innovativeness and social innovativeness.
2) A research model of the antecedents and consequences of perceived innovativeness (Figure 1).

These two approaches have different purposes. The results of the ranking provide a general overview of the market situation, serve as an innovation benchmark for companies, and can assist researchers in the innovation-related public debate. The results from running the full model can be used by managers as a basis for planning investments in innovations and deciding where to invest, what segments to prioritize, and what effects to expect.

SAMPLING STRATEGY

The NII relies on customers' evaluations of companies' innovative activities. This requires two sampling strategies—one for selecting companies and one for selecting respondents (Figure 2).

Sampling of Companies

For feasibility reasons, we do not cover all existing companies. In selecting companies, we apply the following criteria: 1) companies must represent industries with the highest proportion of household spending, jointly accounting for a minimum of 70% of all household consumption, 2) companies within each of the selected industries must jointly account for a minimum 70% of the respective markets. The list includes both private firms and public organizations.

We divide the total sample into two groups: the reduced model sample and the full model sample. The reduced model sample includes most of the selected companies, for whom we collect Figure 1's main dependent variables (perceived firm innovativeness, relative attractiveness, and customer loyalty) as well as measures of digital innovativeness and social innovativeness. The full model sample includes companies that have funded the additional collection of data for measuring customer-perceived changes in value co-creation dimensions.

Sampling of Respondents

We use a nationally representative sample of the Norwegian population aged 15 years or older. The data collection bureau Norstat, recruit respondents from their own, nationally representative web panel that consists of about 80 000 individuals (the biggest in Norway). The size of the web panel allows multiple representative sampling based on gender, age, and geographical location. Self-selection for the panel is not possible; the recruitment process is based on random selection and typically starts with a telephone, ad-hoc project, or social media. The quality control is implemented at the level of both questionnaire and respondent to exclude "straight liners" (respondents who answer incorrectly on several questions), "speeders" (respondents who on average use x% less time to answer a questionnaire compared to an average for other respondents in the same survey), "multi-accounts" (respondents who start questionnaires from different accounts in the same browser session). The company has also routines to review the panel and remove duplicated accounts or to detect possible cheating. To reduce churn, Norstat has implemented several processes, such as the design of questionnaires, A/B testing, and gamification, that help increase respondents' interest and loyalty.

When constructing the annual NII, we use data that were collected throughout the year on a rolling basis. At the beginning of a survey, randomly selected panel members identified from a list of companies (that are grouped into industries) those that they regularly used during the last six months. Each respondent then fills out the questionnaire for up to six companies that are randomly selected from those identified by the respondent. Depending on the company of interest's market share (or separate agreements), we recruit 100, 300 (most of the sample), or 1200 (300 per quarter) respondents. These are the company

quotas, which are filled by a random drawing from the nationally representative sample of respondents during a calendar year.

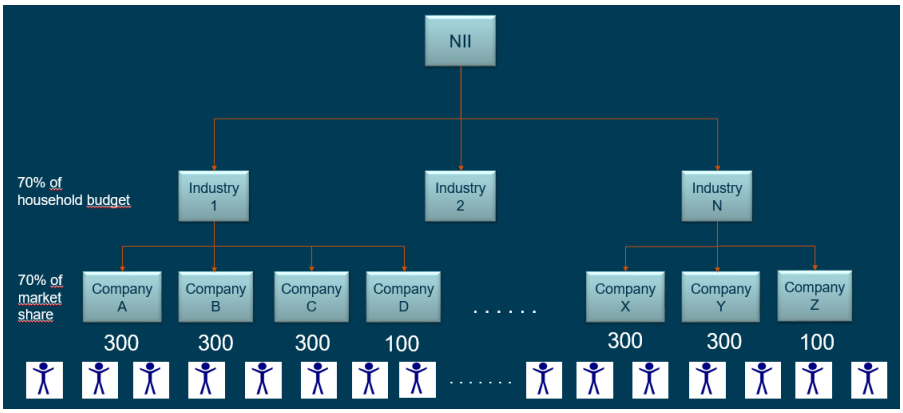

Figure 2. Data collection and aggregation strategy

Our sampling strategy has proved to be efficient in terms of both ensuring the feasibility of data collection and covering the main market players whose innovations tend to have the largest effects on customers' daily lives. Its main limitation is that it excludes startups and other firms with lower market shares as well as industries with lower shares of wallet. Collecting data for such firms pose a significant cost challenge and, in many cases, infeasible without violating the principle of national representativeness. Nevertheless, to keep pace with the market development, we ask respondents to indicate in an open text box whether they regularly use a company other than the ones suggested on the list (these open text boxes are presented at the end of each group of companies from the same industry). These answers are monitored after data collection, and the most often mentioned firms are evaluated for inclusion. Finally, we regularly adjust the sample of companies by including or excluding industries with lower shares of wallet based on the industries' relevance to the ongoing or potential public debate.

MEASURES

Preliminary interviews indicated that consumers use salient examples of innovations to form general perceptions of how innovative a firm is. Perceived firm innovativeness is "*consumers' perception of an enduring firm capability that results in novel, creative and impactful ideas and solutions*" (Kunz et al., 2011, p. 817). It is a subjective perception based on consumers' direct and indirect experiences. Direct experiences are experiences consumers have gained through personal interaction with companies' market offerings over time, whereas indirect experiences result from information received either through word of mouth, word of mouse, or firm-generated communication. Firms need to deliver consistently on both direct and indirect experiences to build a strong perception of firm innovativeness (Brown & Dacin, 1997). In general, firms tend to be perceived as more innovative when they can deliver observable, novel, and creative solutions regularly with a significant market impact, at a fast and consistent rate over time (e.g., Roehrich, 2004; Im & Workman, 2004). Exactly what solutions a firm needs to innovate on depends on what cues consumers use when they form their perception of that firm's innovativeness. These cues may be of two types: "mechanics", which are related to physical artifacts and facilities, and "humanics", which are related to human interaction (Carbone & Haeckel, 1994; Zomerdijk & Voss, 2010). To identify and cover the range of possible cues, we reviewed relevant literature and conducted 30 interviews. Based on the analysis, we have defined four categories of perceived changes that are observable to customers: innovation in the value proposition, innovation in value actualization, innovation in relationship experience, and innovation in interaction space. The value proposition is a subjective assessment of a firm's offer to address one's specific wants and needs (Rintamäki et al., 2007). As a symbol of prospective benefits, a value proposition "exists" only as a potential to be actualized in the customer usage process through resource integration (Gummesson, 2007; Payne et al., 2008; Vargo & Lusch, 2004). The main prerequisite for this process is that a firm and a customer engage in a relationship (Walter et al., 2001), and relationships with firms emerge from experiences of how firms establish, maintain, and enhance interactions with customers (Fournier, 1998; Grönroos, 2004). Importantly, these interactions happen in a physical and/or digital space that provides various stimuli (e.g., form, graphics, layout, style, and ambient conditions) affecting customers' emotions, cognitions, and behaviors (e.g., Bitner, 1992; Holmqvist et al., 2020; Pullman & Gross, 2004).

To operationalize the dimensions of value proposition, value actualization, relationship experience, and interaction space, we used a multi-step procedure. First, we developed an initial set of items based on the existing constructs (e.g., Bitner, 1992; Lovelock & Wright, 2002; Seiders et al., 2007; Sureshchandar et al., 2002; Vargo & Lusch, 2004; Zolfagharian & Paswan, 2008). We then used nine iterative rounds of item sorting and focus group discussions (including a discussion with a language expert) as well as two large-scale tests (1293 and 5812 respondents) that resulted in the set of items that the Questionnaire section presents.

INTERVIEWS

Customers perceive changes that result from their firms' innovation activities. For a complete picture, we also collect information on the actual innovations. In addition to large-scale data collection from customers, we conduct annual interviews of the marketing directors of the firms in our sample (at the end of each year, by phone). The marketing directors answer questions on various innovations that their companies introduced during the year. The structure of the interview guide mirrors our four change categories: change in the value proposition, change in value delivery, change in customer treatment, and change in interaction space.

Innovation in the value proposition. "Let us begin with changes in your value proposition. This includes all types of product innovation. It can be a product or service – completely new or significantly improved concerning its characteristics, technical specifications, built-in software, or other components. Innovation should be new for your business, not necessarily for the market. Have you in XXXX (year) introduced new or significantly improved products, services, or otherwise make changes in your market offering? If yes, could you please describe these changes and provide the time of their launch?"

Innovation in value actualization. "Let us move on to new or significantly improved production methods or new or significantly improved methods for delivering products and services. These innovations should be new for your company, but you do not have to be the first one on the market to introduce these processes. Have you in 20XX introduced new or significantly improved methods for the production, storage, delivery, or distribution of products and services? If yes, could you please describe these changes and provide the time of their launch?"

Innovation in relationship experience. "The next area we are interested in is changes in your customer follow-up. These include changes in how you interact and communicate with customers, changes in loyalty or customer care programs, and any other changes in how you treat customers. Have you during 20XX introduced such changes? If yes, could you please describe these changes and provide the time of their launch?"

Innovation in interaction space. "The last area covers changes in the physical and digital surroundings of your delivery. This includes changes in the appearance of websites or interior decoration, changes in your visual profile, and the design of physical and digital facilities. Have you during 20XX introduced changes to the company's physical and digital surroundings? If yes, could you please describe these changes and provide the time of their launch?"

"Finally, could you please tell us which of the changes that you described today were new to the market?"

DATA SCREENING

Internet-based survey research is prone to careless responses, which poses a threat to data quality (Meade & Craig, 2012). Careless respondents reduce variance, decrease a study's power, and can negatively affect effect sizes (Marjanovic et al., 2015). Our respondents must answer all questions, so our datasets have no omitted responses. To identify careless respondents, we use standard deviation in data screening (Marjanovic et al., 2015; Weathers & Bardakci, 2015). Based on preliminary analysis, we classify respondents as careless if their cases have a standard deviation of zero on loyalty, relative attractiveness, perceived innovativeness, digital innovation, and social innovation (i.e., straight-line response pattern). In our datasets, the percentage of careless respondents constitutes 1-2%.

Example of SPSS syntax for data screening:

```
COMPUTE SdScreen=SD(Aq7_1N1,
Aq7_1N2,Aq7_1N3,Aq8_1N1,Aq8_1N2,Aq8_1N3,Aq8_1N4,Aq10_1N1,Aq10_1N2,Aq10_1N3,
Aq10_1N4,Aq17_1N1,Aq17_1N2,Aq17_1N3,Aq19_1N1,Aq19_1N2,Aq19_1N3,Aq19_1N4).
EXECUTE.
SORT CASES BY SdScreen (A).
```

SPSS syntax for creating age groups (1 – "Young and free"; 2 – "Chaos in life"; 3 – "Got my life back"):

```
RECODE Aq26.1 (0 thru 29=1) (30 thru 59=2) (60 thru 150=3) INTO Groups.
EXECUTE.
```

MEASUREMENT MODEL AND LATENT VARIABLE SCORES

Since most of our observed variables are ordinals (measured on a 7-point Likert scale), we consistently apply robust maximum likelihood estimation based on polychoric correlations (Table 1) and their asymptotic covariance matrix (Joreskog, 2002; Joreskog et. al., 2017). Alternatively, one can use diagonally weighted least squares estimation (NB, it is important to be consistent in applying the selected estimation in future runs). The following procedure describes the measurement model used for testing validity and reliability as well as getting latent variables scores (i.e., the values of main variables of interest per respondents that we use to create rankings).

1) Save an SPSS file with the necessary variables
2) Import the file into LISREL, using the "Import" button, going to the file location, and selecting the .sav extension. Choose a location for saving the .lsf file
3) If there are continuous variables in the File.lsf (if not, go to step 4 directly), go to Data => Define variables, select continuous variables, and click on Variable Type => Continuous => Ok. Safe file.
4) Create a new file: File => New => Syntax Only; write code for measurement model (this is a SIMPLIS-based code, which uses raw data in estimation).

Example of the LISREL syntax code for measurement model and latent variable scores for Loyalty, Relative Attractiveness (RelAttr), Perceived Firm Innovativeness (Inno), and Digital Innovation Index (Dii).

```
Raw Data from file Filename.LSF
Analyze correlations
Latent Variables
Loyalty RelAttr Inno Dii
Relationships
q7_1-q7_3 = Loyalty
q8_1-q8_4 = RelAttr
iq10_1-iq10_4 = Inno
q15_1-q15_3 = Dii
LSFFile Filename.LSF
Robust Estimation
Lisrel Output
Path Diagram
End of problem
```

Note: For example, `q7_1-q7_3` means three observed variables in a row (q7_1, q7_2, q7_3) will be used to measure the latent variable Loyalty.

5) Run LISREL. Output is available in Window => Filename.OUT (factor loadings, parameter estimates, standard errors, SRMR). Due to technical issues, the correct χ2, RMSEA and other χ2-based statistics should be reported from a separate file: Open => Choose extension All files (*.*) => Open Filename.FTB. The correct statistics are in the column C3. In reporting, we primarily focus on χ2, df, RMSEA, NNFI, and SRMR (Hair et al., 2010).

6) The line `LSFFile Filename.LSF` produces a new file (FilenameNew.lsf) in the same folder. This file contains latent variable scores that we use to create rankings.
7) For the correct assessment of the measurement model, there is a need to calculate composite reliability, AVE, and MSV – this must be done separately. For additional discriminant validity and common method bias tests, the syntax code (step 5) might be modified to run the single-factor model and the model with an additional single, unmeasured latent method factor.

It is also possible to use other software that can handle structural equation modeling, for example, R, Mplus, or SmartPLS. At the end of the next section, we describe the corresponding procedures for SmartPLS and R. Note that the results will slightly vary due to differences in estimation techniques, so it is important to use the chosen software consistently for the same task year after year.

RANKING

We base the ranking on latent variable scores that are calculated for each respondent during the estimation of the measurement model. This provides a more precise estimation as compared to weighted averages of observed variables.

1) Open datafile FilenameNew.lsf (automatically created in the same folder after running the code for measurement model) => File => Export Data => Save as Type: SPSS Data File (*.sav) => Name the file => Save
2) Open FileName.spss. The latent variable scores for the relevant constructs would have the same names as the labels for the corresponding latent variables in LISREL with underbars (e.g., Loyalty_, RelAttr_, Inno_, Dii_)
3) To be used in ranking, the latent variable scores need to be normalized and then multiplied by 100 to be presented on a 0-100 scale. The following formula is used for normalization:

$$X' = \frac{X - X_{\min}}{X_{\max} - X_{\min}}$$

   a) Get the minimum and maximum for each variable of interest. Analyze => Descriptive Statistics => Descriptives => choose variables, check that minimum and maximum are ticked, or use the following syntax (example):

```
DESCRIPTIVES VARIABLES=Loyalty_ RelAttr_ Inno_ Dii_
 /STATISTICS=MEAN STDDEV MIN MAX.
```

Descriptive Statistics

	N	Minimum	Maximum
Loyalty_	23135	1,09	7,61
RelAttr_	23135	1,10	7,84
Inno_	23135	1,15	8,08
Dii_	23135	1,08	7,89
Valid N (listwise)	23135		

   b) The following syntax is an example of syntax that produces the NII scores for three variables: loyalty, relative attractiveness, and perceived innovativeness. The mean scores of each of the normalized variables are the NII scores (the numbers must be changed accordingly based on the information from the following step: in the file, include a variable that reflects which company each observation is about – in this example, COMPANY):

```
COMPUTE NormLoyalty=((Loyalty_ - 1.09)/(7.61 - 1.09)) * 100.
EXECUTE.
COMPUTE NormRelAtt=((RelAttr_ - 1.10)/(7.84 - 1.10)) * 100.
```

```
EXECUTE.
COMPUTE NormInno=((Inno_ - 1.15)/(8.08 - 1.15)) * 100.
EXECUTE.
COMPUTE NormDii=((Dii_ - 1.08)/(7.89 - 1.08)) * 100.
EXECUTE.
MEANS TABLES=NormLoyalty NormRelAtt NormInno NormDii BY
  COMPANY
 /CELLS=MEAN .
```

Report

Mean

Brand	NormLoyalty	NormRelAtt	NormInno	NormDii
Meny	75,2609	64,7243	53,5882	37,4460
Extra	70,6205	54,9026	50,8900	41,5282
Kiwi	77,4188	59,1371	56,6490	32,2730
Rema 1000	70,9012	53,9724	51,4584	36,6379
Sbanken	81,6382	74,3796	68,2138	85,0157
Nordea	71,0300	58,3494	54,0453	72,5565
DNB	66,3682	57,4571	57,4034	74,4224
Onecall	71,7329	62,4870	62,2333	68,5351
Telia	66,9451	58,6478	55,5978	69,5474
Telenor Mobil	68,5951	64,8624	59,8637	71,7371
NAV	54,1896	46,0404	36,3854	63,3091
Vinmonopolet	81,3991	66,5962	53,8182	42,2001
Posten	70,7675	61,8649	51,3721	56,5120
Flytoget	75,6973	67,8786	55,0373	62,8018
VY Tog	67,3218	55,2187	45,9161	61,6451
Dagens Næringsliv	62,9333	61,0554	53,4589	60,8917
Aftenposten	61,7743	62,6657	50,8988	61,5364
Dagbladet	50,5913	44,0330	45,3873	59,4444
VG	59,2242	52,6458	54,4068	66,3854
MøllerGruppen	64,0233	56,4620	53,5315	49,4156
Bertel O. Steen	65,2603	60,3701	53,4861	49,2217
Bilia(Volvo, BMW, Toyota og Lexus)	70,9258	64,0587	57,9348	53,7719
Toyota	78,5495	70,3336	61,4251	52,6978
Esso	62,5032	51,3227	47,8054	36,1128
Shell	61,0893	51,7797	48,6385	35,1903
Circkle K	67,1591	53,7149	50,7208	39,6683
Nor-way Bussekspress	70,7898	59,5667	51,5611	60,5577
Nettbuss (herunder TIMEkspressen, Flybussen og Bus4You)	61,9699	53,6604	50,8831	59,0002
Ruter	69,6802	56,0733	51,3824	67,4222
Widerøe	73,9622	56,3657	51,3428	61,3567
Norwegian	70,4146	54,2353	59,8465	72,3811
SAS	75,2531	66,1661	53,0573	68,3643

Alternative software

It is possible to create latent variable scores in other programs that can handle structural equation modeling, such as SmartPLS and R. Due to various estimation algorithms, results slightly vary across the programs, which can lead to small differences in the rankings for companies that have similar scores. This is important to consider in the case of changing the main software. Overall, we highly recommend consistently using the same software for the same task.

Creating latent variable scores in SmartPLS

To create latent factors scores:

1) Save the data file in.csv format, create a new project in SmartPLS
2) Draw the model and link all latent variables to each other.
3) Link the items to their respective latent variables
4) Open Calculate menu and choose the PLS algorithm.
5) Enter Basic settings (Figure 8), then Start calculations
6) You will find the scores for the latent variable scores under Latent variable in the report.
7) Import the scores into SPSS and proceed with the procedure for creating rankings as explained above.

Creating latent variable scores and rankings in R

```
# Downloading necessary analytical packages

library(haven)

library(lavaan)

library(dplyr)


# Importing the dataset (NB write the whole path to the file)

Raw_Q1 <- as.data.frame(read_sav(

  "C:/Users/XXXX/YYYY/ZZZZ/FileName.sav"))


Q_Innovation <- c("iq10_1","iq10_2", "iq10_3", "iq10_4")

Q_Dig_Inno <- c("q15_1", "q15_2", "q15_3")
```

```
df_Inno <- Raw_Q1[, c("Brand", Q_Innovation, Q_Dig_Inno)]


df_Inno$iq10_1 <- unclass(df_Inno$iq10_1)

df_Inno$iq10_2 <- unclass(df_Inno$iq10_2)

df_Inno$iq10_3 <- unclass(df_Inno$iq10_3)

df_Inno$iq10_4 <- unclass(df_Inno$iq10_4)


df_Inno$q15_1 <- unclass(df_Inno$q15_1)

df_Inno$q15_2 <- unclass(df_Inno$q15_2)

df_Inno$q15_3 <- unclass(df_Inno$q15_3)




 Innovation_model <- '

 #Measurement model

 Innovation =~ iq10_1 + iq10_2 + iq10_3 + iq10_4

 Dig_Inno =~ q15_1 + q15_2 + q15_3

  '


#Create models

 # Creates models for perceived firm innovativeness and digital innovation


 fit_Inno <- cfa(Innovation_model,

          data = df_Inno,

          #ordered = c("iq10_1", "iq10_2", "iq10_3", "iq10_4", "q15_1",  "q15_2", "q15_3"),

          #fixed.x = TRUE,

          std.lv = TRUE,

          #std.ov = TRUE,
```

```
        estimator = "PML",
        optim.method = "L-BFGS-B",
        likelihood = "wishart"
        )
fit_Inno

#head(lavPredict(fit_Inno))
#head(lavPredict(fit_Inno, type = "ov"))

idx <- lavInspect(fit_Inno, "case.idx")
fscores <- lavPredict(fit_Inno, method = "ML")
for (fs in colnames(fscores)) {
  df_Inno[idx,fs] <- fscores[ ,fs]
}
head(df_Inno)

#df_Inno <- cbind(df_Inno, lavPredict(fit_Inno, type = "lv", method = "ML"))

#Normalization

Innovation_Min <- round(min(df_Inno$Innovation), digits = 2)
Innovation_Max <- round(max(df_Inno$Innovation), digits = 2)
df_Inno$Innovation <- 100*(df_Inno$Innovation - Innovation_Min)/(Innovation_Max - Innovation_Min)

Dig_Inno_Min <- round(min(df_Inno$Dig_Inno), digits = 2)
Dig_Inno_Max <- round(max(df_Inno$Dig_Inno), digits = 2)
df_Inno$Dig_Inno <- 100*(df_Inno$Dig_Inno - Dig_Inno_Min)/(Dig_Inno_Max - Dig_Inno_Min)
```

```
#Grouping by firms


Output <- df_Inno %>%
  group_by(Firm) %>%
  summarise(
    Innovation = mean(Innovation),
    Dig_Inno = mean(Dig_Inno)
  ) %>%
  arrange(desc(Dig_Inno))


print(as_tibble(Output), n=86)
```

THE STRUCTURAL EQUATION MODEL

Like the measurement model, the code is modified to accommodate the structural relations.

1) Create files with polychoric correlations and asymptotic covariance matrix (Figure 3). Statistics => Output options => Moment Matrix (choose “Correlations”, tick “Save to file”) => name the file, add extension “.pm” => Asymptotic covariance matrix (tick “Save to file”) => name the file, add extension “.acp” => OK

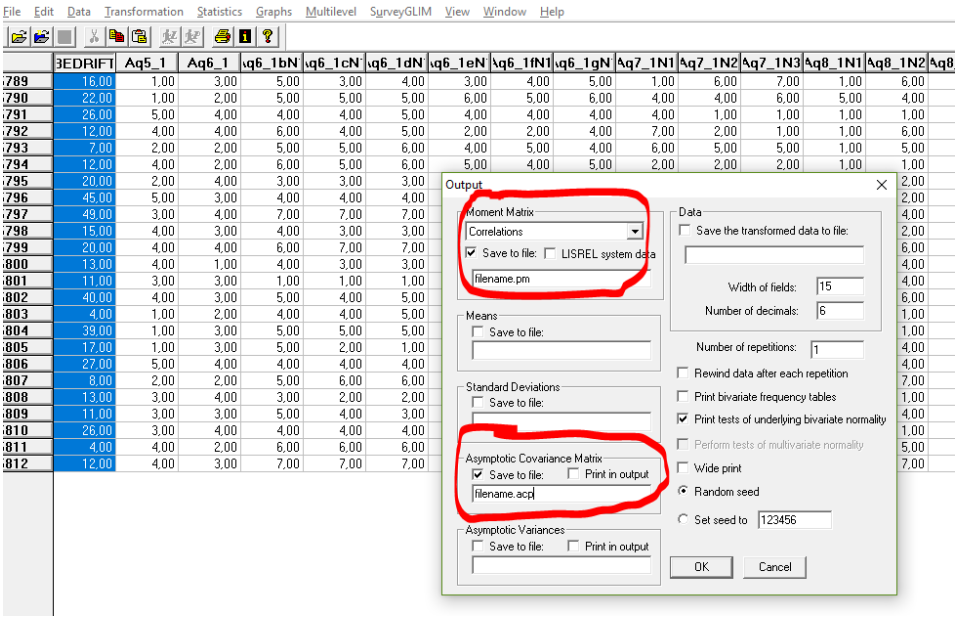

Figure 3. Creating matrices in Lisrel

Example of the LISREL syntax code for full model (corresponds to Figure 1)

```
DA NO=Numberofobservations NI=Numberofvariables MA=PM
PM FI=filename.pm
AC FI=filename.acp

MO NY=17 NX=13 NE=3 NK=4 TD=DI,FR TE=DI,FR BE=FU,FI

LK
ValProp ValReal RelExp IntSpace
LE
Loyalty RelAttr Inno

PA LX
1 0 0 0
1 0 0 0
1 0 0 0
0 1 0 0
0 1 0 0
```

```
0 1 0 0
0 1 0 0
0 0 1 0
0 0 1 0
0 0 1 0
0 0 0 1
0 0 0 1
0 0 0 1

PA LY
1 0 0
1 0 0
1 0 0
0 1 0
0 1 0
0 1 0
0 1 0
0 0 1
0 0 1
0 0 1
0 0 1

FR BE 1 2 BE 2 3 BE 3 4 BE 2 4 BE 2 5 BE 5 4
FI GA 2 1 GA 2 2 GA 2 3 GA 2 4 GA 1 1 GA 1 2 GA 1 3 GA 1 4 GA 3 1 GA 3 2 GA 3 3 GA 3 4

PD

OU MLR FT
```

RESULTS

Figure 4 presents the scores for perceived innovativeness, relative attractiveness, and customer loyalty from the 2021 NII (the respondents were 23802 consumers of 84 companies from 22 industries). The results demonstrate a strong, positive relationship between perceived innovativeness and relative attractiveness, as well as relative attractiveness and customer loyalty. We found exceptions in industries with little or no competition, where behavioral loyalty (i.e., repurchase or continuation of customer relationship) can be high despite low relative attractiveness and low perceived innovativeness.

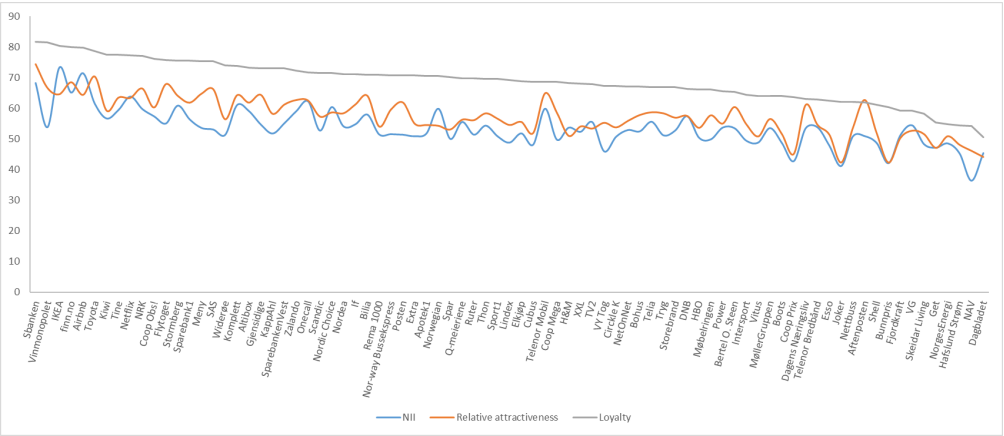

Figure 4. Mapping innovativeness, relative attractiveness, and customer loyalty

The Norwegian Customer Satisfaction Barometer (https://www.bi.no/forskning/norskkundebarometer/) has annually tracked customer satisfaction for more than 150 companies since 1996. Today, the index is well-established and serves as an important parameter and benchmark for Norwegian companies. The latter use it for marketing purposes as well. The Norwegian Customer Satisfaction Barometer relies on a similar method and procedure as other national customer satisfaction indices such as the American Customer Satisfaction Index. For documentation, see Johnson et al. (2001).

Perceived innovativeness vs Customer satisfaction

Customer satisfaction indices reflect the level and variance of the quality of companies' market offerings. The innovation index provides an insight into their creativity, innovativeness, and abilities to be a pioneer and change the market. Data from the Norwegian Innovation Index and the Norwegian Customer Satisfaction Barometer or equivalent, provide complementary data that can jointly provide interesting and important strategic insights.

When combining the satisfaction scores with the scores on perceived innovativeness – by mapping the satisfaction scores along the X axis and the perceived innovativeness scores along the Y axis – we get a 2 by 2 matrix (Figure 5). This illustrates four different situations companies can be in. Companies with

low scores on both customer satisfaction and perceived innovativeness are in, or close to, a critical situation and can only expect to stay in business as long as there are no other competitors, or the competitors are similarly mediocre.

Companies that score low on satisfaction but high on perceived innovativeness can be seen as “Impulsive” – they rush into the launch of new ideas without ensuring the quality of offerings.

We describe as “Reliable” those companies that ensure a relatively high quality of their market offerings but are conservative with innovation. They score high on customer satisfaction, but their activities do not excite their customers.

Finally, we see companies that succeed in providing high-quality new market offerings as “Market drivers”. Their customers are both excited about and satisfied with the companies’ value propositions.

Figure 6 presents the Norwegian industry-level data from 2021 according to this framework.

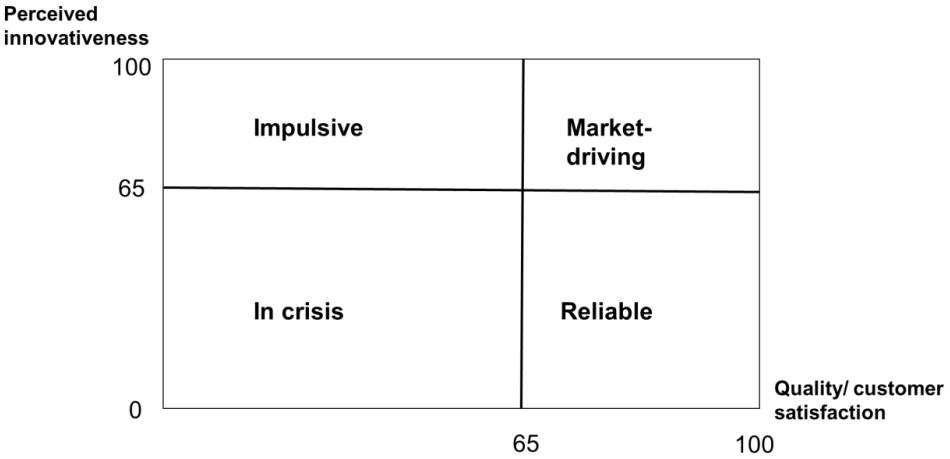

Figure 5. Perceived innovativeness and customer satisfaction

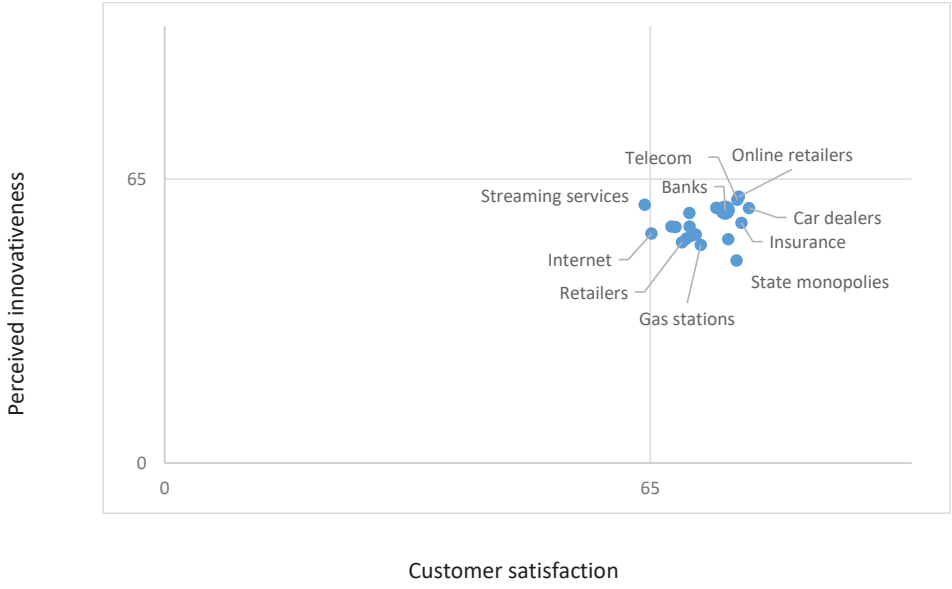

Figure 6. Perceived innovativeness and customer satisfaction: Norwegian industry-level data, 2021

SUB-SAMPLE ANALYSIS

Our data allow further analyses based on various sub-samples, such as customer segments, industries, or specific companies. For example, we differentiate between three customer segments, following Andreassen et al. (2015) who found three distinct life stages that reflect different needs, preferences, and frames of reference, defining customers' perceptions of the value creation process. The first life stage, "Young, free, and simple," describes young people who study or work and live by themselves or with their partner, typically without children. Their behavior is characterized by prioritizing quantity of life in the form of diverse activities and variety seeking in private, professional, and social arenas. The second life stage, "Chaos in my life," describes middle-aged people with dynamic professional and family life, typically with children. Finally, the life stage "Got my life back" describes elderly adults who tend to have a more stable and predictable lifestyle, with relatively more time, higher disposable income, and less price sensitivity. In the data set, we use age as a proxy, categorizing the respondents into three customer groups: young (under 30 years), middle-aged (30–59), and elderly (over 60). The cutoff of 30 years is based on the mean age of the parents at first birth in Norway (according to Statistics Norway).

When analyzing the results for smaller samples, we use SmartPLS 3.2.6. In our dataset, we do not have missing values, because respondents must answer all the questions, but if there are missing values in a dataset, one should apply casewise (listwise) deletion. We run the analyses in line with the recommendations provided by Hair et al. (2017) and Wong (2013).

Main steps when analyzing data in SmartPLS

1) Select the company or segment of interest, save the data file in .csv format, create a new project in SmartPLS (or, if applicable, open the csv. file used to create latent variables scores)
2) Draw model and link items to latent variables (Figure 7).

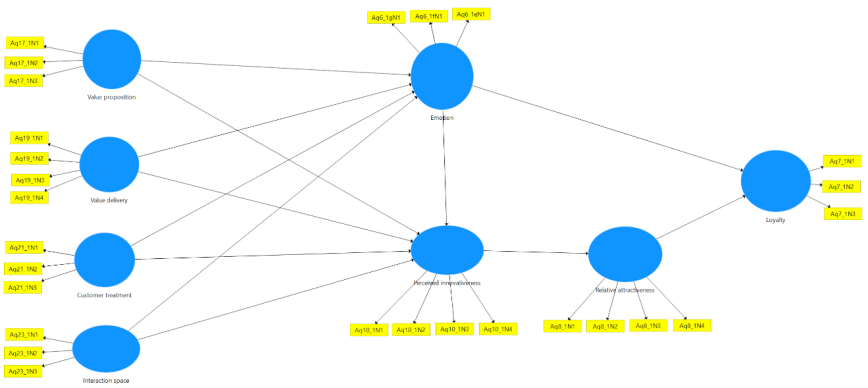

Figure 7. PLS model

3) Open Calculate menu and choose PLS Algorithm
4) Enter Basic settings (Figure 8), then Start calculations

Figure 8. Basic settings

5) Analyze output: Double-click path diagram and empirical model with path coefficients. Factor scores for items and Rsquare will appear. Enter Reports to the left and written reports will appear (Figure 9).

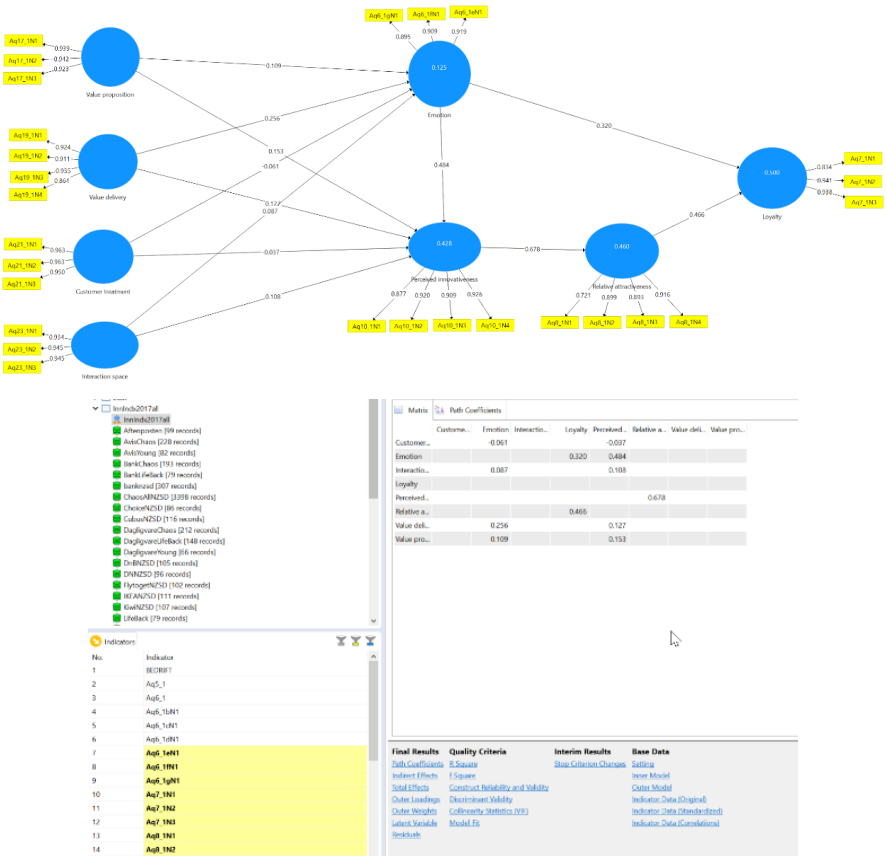

Figure 9. Analyzing output

6) Open Calculate menu and choose Bootstrapping, choose Basic setting (Figure 10), then Start to calculate

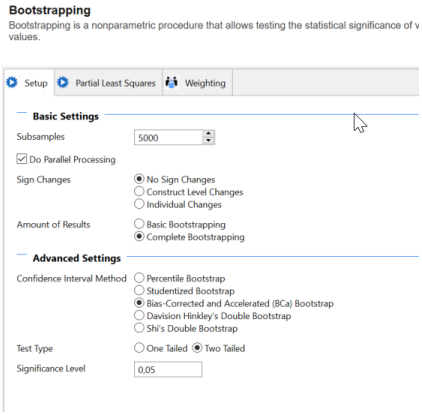

Figure 10. Bootstrapping

7) Analyze output: Double click path diagram and empirical model with t-values for the path coefficient, and items will appear (Figure 11). Enter Reports to the left and written reports will appear.

Presenting the results

When presenting the results from the SmartPLS analyses, we use the path diagrams recreated in PowerPoint. Only significant paths are included in the presentation, the strength of each path is indicated by the thickness of the line drawn between the variables.

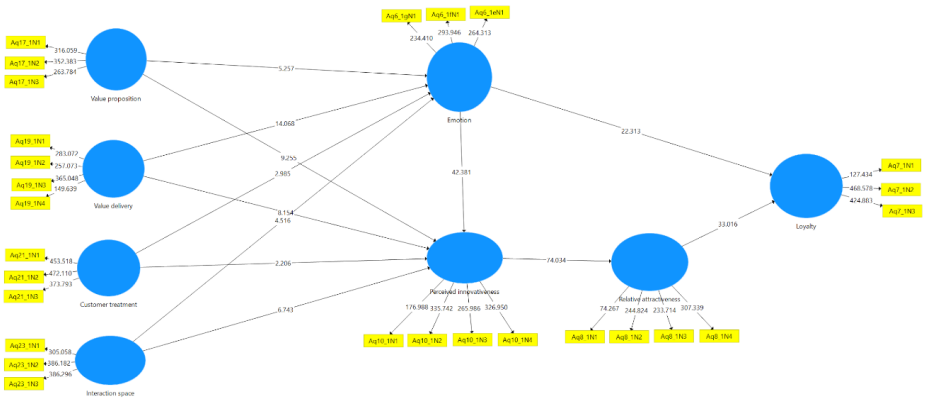

Figure 11. PLS results after bootstrapping

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QUESTIONNAIRE

B2C, including versions for private and public companies

Main variables

Perceived innovativeness (Kunz et al., 2011): ***Version for private companies***

To what extent do you agree or disagree with the following statements:

- X changes the market with its offers
- X is a very creative company
- X is a pioneer in its category
- X is an innovative company

Perceived innovativeness (Kunz et al., 2011): ***Version for public organizations***

To what extent do you agree or disagree with the following statements:

- X is future-oriented in its solutions
- X is a very creative organization
- X is early on with new solutions
- X is an innovative organization

Digital innovation (developed for NIII)

To what extent:

- Would you describe X's products and services as digital?
- Do you apply digital technology when you buy and use X's offerings?
- Do you associate X with advanced digital technologies?

Social innovation (the first three questions are from the American Innovation Index, and the last one is an additional question developed for NII).

To what extent do you agree or disagree with the following statements:

- X has innovative offerings that benefit society and the environment
- Benefiting society and the environment is a priority for X
- X regularly comes up with innovative solutions to social and environmental problems
- In the development of new products and services, the environment and society are as important to X as profitability

Relative attractiveness (Andreassen & Olsen, 2008)

Please compare X with other companies that offer similar products and services. To what extent

- Does X provide products and services of better value than other similar companies?
- Does X provide products and services of better quality than other similar companies?
- Does X have a better reputation than other similar companies?
- Is X more attractive than other similar companies?

Customer loyalty (Johnson et al., 2001; Zeithaml et al., 1996)

- How likely or unlikely is it that you will continue being a customer of X?
- How likely or unlikely is it that you will recommend X to someone who seeks your advice?
- How likely or unlikely is it that you say positive things about X to other people?

Change in the value proposition

Think about X's market offerings. During the last few months, to what extent has there been a change in

- How do X's offerings match your wants?
- How do X's offerings meet your needs?
- In X's overall market offering?

Change in value actualization

Think about your experience with getting what X offers. During the last few months, to what extent has there been a change in

- The way X delivers what it offers?
- How easy it is to make use of X's offerings?
- How quickly X delivers what it offers?
- Your efforts when making use of X's offerings?

Change in relationship experience

Think about your experience with how X takes care of their customers. During the last months, to what extent has there been a change in

- The way X treats you as a customer?
- The way X takes care of you as a customer?
- The way X communicates with you?

Change in interaction space

Think about your experience with X's physical and digital facilities. During the last months, to what extent has there been a change in

- The appearance of X's web page or interiors?
- The design of physical surroundings or digital solutions?
- The visual appeal of X's facilities?

Additional variables

How long have been X's customer?

- less than 1 year
- 1-2 years
- 3-5 years
- More than 5 years
- Don't remember

How often do you use X's products or services?

- daily
- weekly
- monthly
- yearly

Which products or services you had in mind most of the time while you were answering? (open-ended question)

What changes, if you have noticed any, were introduced by X to address the current economic situation?

What is your household's gross income?

- up to 300 000 kr
- 300 000 – 499 999 kr
- 500 000 – 799 999 kr
- 800 000 – 999 999 kr
- 1000 000 – 1 499 999 kr
- over 1 500 000 kr
- don't want to indicate
- don't know

*How much does your household monthly use on X's products and services?**

**the choice of the range depends on the industry*

- 0-99 kr (0-999 kr) (0-99 999 kr)
- 100-199 kr (1000-1999 kr) (100 000-199 000 kr)
- 200-399 kr (2000-3999 kr) (200 000-499 999 kr)
- 400-649 kr (4000-6999 kr) (500 000-1 mln kr)
- 650-999 kr (7000-9999 kr) (1-2 M kr)
- over 1000 kr (over 10 000 kr) (over 2 M kr)
- don't want to indicate
- don't know

What is your post number? (open-ended question)

What is your main occupation?

Do you work full-time or part-time?

Age

Sex

What is your highest education level?

What is your marital status?

QUESTIONNAIRE

B2B (example of a consulting company)

NB: The respondents are those who indicated that their employer uses the consulting company's services. They are asked to fill out the questionnaire based on their experience with the consulting company.

Perceived innovativeness:

To what extent do you agree or disagree with the following statements:

- X changes the consulting market with their way of work
- X is a very creative company
- X is a pioneer in its category
- X is an innovative organization

Digital innovation (developed for NIII)

To what extent:

- Would you describe X's way of work as digital?
- Do you apply digital technology when you buy and use X's offerings?
- Do you associate X with advanced digital technologies?

Social innovation (the first three questions are from the American Innovation Index, and the last one is an additional question developed for NII).

To what extent do you agree or disagree with the following statements:

- X has innovative offerings that benefit society and the environment
- Benefiting society and the environment is a priority for X
- X regularly comes up with innovative solutions to social and environmental problems
- In the development of new services, the environment and society are as important to X as profitability

Relative attractiveness (Andreassen & Olsen, 2008)

Please compare X with other companies that offer similar services. To what extent

- Is their work of better value than other consulting companies?
- Is their work of better quality than other consulting companies?
- Does X have a better reputation than other consulting companies?
- Is X more attractive than other consulting companies?

Customer loyalty

To what extent do you agree with the following statements:

- My firm should continue to use X
- I will recommend X if someone seeks my advice
- I will say positive things about X to other people

Change in the value proposition

Think about X's market offerings. During the last few months, to what extent has there been a change in

- How do X's services match your wants?
- How do X's services meet your needs?
- In X's overall market offering?

Change in value actualization

Think about your experience with getting what X offers. During the last few months, to what extent has there been a change in

- The way X delivers what it offers?
- How easy it is to make use of X's services?
- How quickly X delivers what it offers?
- Your efforts when making use of X's services?

Change in relationship experience

Think about your experience with how X takes care of their customers. During the last months, to what extent has there been a change in

- The way X treats you as a customer?
- The way X takes care of you as a customer?
- The way X communicates with you?

Change in interaction space

Think about your experience with X's physical and digital facilities. During the last months, to what extent has there been a change in

- The X's service design?
- The visual appeal of X's services?
- The design of physical surroundings or digital solutions?

Appendix A

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Competing through innovation: Let the customer judge!

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ABSTRACT

Although customers are the final judges of innovations, their opinions on firms' innovations are rarely listened to. In this article, we developed a novel model for examining the antecedents and consequences of perceived firm innovativeness. We argue that when customers cognitively register changes in the value creation introduced by a firm, they perceive the firm as more innovative and, consequently, more attractive than its competitors. Using two waves of data from nationally representative samples (1,293 and 1,583 responses), we developed measures for examining changes in value creation that firms introduce and customers can perceive. We tested our theory by applying structural equation modeling to data from a nationally representative sample (5,812 responses). We found that firms that introduced changes affecting value proposition, value actualization, and interaction space were perceived as more innovative and more attractive than their competitors. Surprisingly, changes in relationship experience are negatively associated with perceived innovativeness and contribute to lower relative attractiveness in the market. One explanation is that firms introduce relationship innovations to safeguard future cash flows, which customers do not necessarily see as innovative.

1. Introduction

Since its earliest conceptualization, innovation has been considered the source of new value creation (Schumpeter, 1934). Initially characterized by firms' activities (Porter, 1985), value creation has evolved into the customer-centric notion defined as "the customer's process of extracting value from the usage of resources" (Grönroos & Gummerus, 2014, p. 209). However, much of the academic literature still views innovation as defined within the organizational domain in which managers have the strongest voice (Mendoza-Silva, 2020; Saunila, 2020). For example, in the Community Innovation Survey, which has served as an important data source for many researchers (e.g., Battisti & Stoneman, 2010; Laursen & Salter, 2006), managers assess whether what their firms have launched is a significant improvement. Managerial perceptions and reports also constitute the basis for our current understanding of innovation performance and its links to market performance (Gök & Peker, 2017; Mendoza-Silva, 2020). In some studies, managers even evaluate the extent to which their firms deliver "exactly what customers want" or what "exceeds customers' expectations" (Ngo & O'Cass, 2013, p. 1,139).

Such a firm-centric view inevitably leads to a focus on what is observable and possible to report for managers, such as changes in technical or functional characteristics, whereas customers' experiences of innovations remain underexplored (Andreassen, Lervik-Olsen, & Kurtmollaiev, 2017; Gustafsson, Snyder, & Witell, 2020; Christensen, Hall, Dillon, & Duncan, 2016). More importantly, the firm-centric view is inconsistent with contemporary value creation theories (e.g., Grönroos & Voima, 2013; Vargo & Lusch, 2004), because it overemphasizes firms' activities constituting the provider sphere that is by definition closed to the customer and where no real value is created (Grönroos, 2017). Firms' innovation efforts that occur in the provider sphere are instead congruous with the notion of invention, and inventions become innovations only when they are commercialized and put into practice (Gustafsson et al., 2020; Schumpeter, 1934); that is, when they enter the joint sphere encompassing direct interactions between the firm and the customer (Grönroos, 2017; Grönroos & Ravald, 2011). Currently, the understanding of customers' innovation-related perceptions is limited to satisfaction with and loyalty to firms that customers perceive as innovative, whereas large-scale, generalizable research on customers' perceptions of firms' innovation efforts is lacking

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(Ghanbarpour & Gustafsson, 2022; Kunz, Schmitt, & Meyer, 2011). This situation is unfortunate given that customers are the actual recipients and evaluators of innovations, and innovations often directly influence customers' lives and well-being (Anderson et al., 2013). Furthermore, customers are key to firms' future revenue and cash flows (Tsai & Yang, 2013). Therefore, gaining a better understanding of customers' perceptions of firms' innovativeness can both enrich existing theoretical knowledge and provide strategic information to decision makers in firms.

In line with calls for novel approaches to studying innovations (Gustafsson et al., 2020; Ostrom, Parasuraman, Bowen, Lia, & Voss, 2015), we developed a customer-based framework to analyze firms' innovation efforts and investigated the antecedents and consequences of perceived firm innovativeness. Our point of departure was twofold: 1) customers—not managers or experts—are the users and thus the best judges of innovations (Gustafsson et al., 2020), and 2) the primary means of influencing the customer's perceptions of the firm's innovations and innovativeness is introducing changes in the joint sphere through the commercialization of new solutions (Grönroos, 2017; Grönroos & Voima, 2013). Consequently, we theorized that firms' innovation efforts taking place in the provider sphere are implemented through changes in the joint sphere, where they affect customers' perceptions and experiences. We also hypothesized that firms that are perceived as more innovative by their customers are perceived as more attractive than their competitors. We built a theoretically derived measurement instrument, tested it on two waves of data from nationally representative samples (1,293 and 1,583 responses), and, finally, used a nationally representative sample of customers (5,812 responses) to test our model.

This study makes several contributions to the innovation and marketing literature. Arguing that customers tend to form perceptions based on their overall experiences with firms rather than specific characteristics of concrete products, this study is the first to investigate the antecedents of perceived firm innovativeness from the value creation perspective based on service logic (Grönroos, 2011; Grönroos & Voima, 2013). We also provide a new theoretically derived and empirically validated instrument for measuring customers' perceptions of firms' innovations from a value-creation perspective. Moreover, the study offers novel insights into the consequences of perceived firm innovativeness other than the traditional satisfaction–loyalty link. Taking up the idea that customers' assessments of a focal firm should be seen in relation to other market players (Keiningham, Aksoy, & Williams, 2015), this study is the first to show that customers' perceptions of firm innovativeness guide their comparisons of competing firms. Finally, the study provides strategic insights into the central role of the customer-based measure of innovativeness in resource allocation, which firms can use in combination with existing and well established customer-based performance measures, such as customer satisfaction (e.g., Fornell, Johnson, Anderson, Cha, & Bryant, 1996).

2. Theoretical framework

2.1. Firm-centric and customer-centric views of innovativeness

The academic literature on firm innovativeness presents two distinct views on how to conceptualize and study firm innovativeness: an inside-out, firm-centric view and an outside-in, customer-centric view (Ghanbarpour & Gustafsson, 2022). Although both views see firm innovativeness as reflecting the frequency and extent of innovation-related activities, their analytic foci differ considerably, as shown in Table 1.

The firm-centric view builds on management theories and favors effort intensity (e.g., R&D expenditure, R&D manpower, patent applications, number of patents, product introductions, and share of new products). Its main focus is on how various characteristics of firm processes affect innovation and performance (Table 2). However, cumulative evidence suggests that these characteristics may have a low impact on new product performance levels (Henard & Szymanski, 2001). As customers are the users and final "judges" of innovations, many marketing researchers have recognized the importance of including the customer perspective on innovation and innovativeness (e.g., Barone & Jewell, 2013; Hubert et al., 2017; Lowe & Alpert, 2015; Shams, Alpert, & Brown, 2015). The fundamental idea is that in the space between what firms do (e.g., launching a new product) and what firms receive (e.g., financial results), there are often the neglected factors of what customers think (e.g., perception of innovativeness) and what customers do (e.g., purchase behavior) (Gupta & Zeithaml, 2006). Correspondingly, the customer-centric view emphasizes customers' subjective assessments of firms' innovation outputs in relation to customers' own needs and expectations (Table 2).

Table 1
Firm-centric and customer-centric views of innovation and innovativeness.

	Firm-centric view	Customer-centric view
Basic philosophy	Innovation is defined within the provider sphere; success in innovation is determined by organizational factors	Innovation is defined within the joint sphere; success in innovation is determined by customers' experiences and perceptions
Interpretation of innovation	A discrete novel solution (e.g., new product/service, process, and business model)	A change in how customers and firms co-create value (e.g., a new way of fulfilling a "job-to-be-done")
Interpretation of innovativeness	A firm's ability to develop and introduce new products and services	A firm's ability to continuously address consumers' needs and preferences in a novel way
Research focus	The influence of various organizational characteristics on innovativeness and performance (antecedents of firm innovativeness)	The influence of firm innovativeness on customers' attitudinal and behavioral responses (consequences of firm innovativeness)
Measurement of innovativeness	The frequency of launching novel solutions by the firm and/or their radicalness	The customers' overall perception of the firm as creative and market driving
Main data source	Managers (e.g., *Community Innovation Survey;* Danneels & Kleinschmidt, 2001; Laursen & Salter, 2006; Rubera & Kirca, 2012; Rubera & Kirca, 2017) and experts (e.g., Chandy & Tellis, 2000; Sorescu, Chandy, & Prabhu, 2003)	Customers (e.g., Ghanbarpour & Gustafsson, 2022; Kunz et al., 2011; Hubert et al., 2017; Sirdeshmukh et al., 2018; Pappu & Quester, 2016)

Although the existing literature on the customer-centric view undoubtedly enriches the understanding of innovativeness, it remains confined to the traditional satisfaction–loyalty link, which overlooks the fact that in the market with competing players, customers' perceptions of a specific firm relative to the firm's competitors is a more important indicator of success than customer satisfaction (Keiningham et al., 2015). More importantly, studies within the customer-centric view tend to neglect the antecedents of perceived firm innovativeness (Table 2) and do not capture theoretical developments in value-creation research. Instead, the existing literature builds on traditional approaches relying on the assumption that customers perceive and evaluate innovations as context-independent distinct outputs at the attribute or product level (Gustafsson et al., 2020). For example, this assumption is central to such common approaches as asking customers to evaluate the degree of product newness or Rogers' (1962) product attributes of relative advantage, compatibility, complexity, trialability, and observability (Danneels & Kleinschmidt, 2001; Shams et al., 2015). Such approaches essentially imply that customers evaluate innovations based on clear perceptions of all existing and new elements in a company's product portfolio (e.g., Hubert et al., 2017; Sweeney & Soutar, 2001; Zolfagharian & Paswan, 2008). However, as a growing body of research has suggested, this assumption is rather simplistic because customers tend to form perceptions of value based on their overall experiences with

Table 2
Antecedents and consequences of firm innovativeness in previous research.

Study	View	Key concept	Definition	Antecedents	Consequences
Lawson and Samson (2001)	Firm-centric	Innovation capability	The ability to continuously transform knowledge and ideas into new products, processes, and systems for the benefit of the firm and its stakeholders	Vision and strategy, competence base, organizational intelligence, creativity and idea management, organizational structure and systems, culture and climate, technology management	Innovation performance, firm performance
Calantone, Cavusgil, and Zhao (2002)	Firm-centric	Firm innovativeness	The rate of innovation adoption by the firm and the firm's willingness to change	Learning orientation	Firm performance
Deshpande and Farley (2004)	Firm-centric	Organizational innovativeness	Being first to market, avoiding late entry and stable markets, and being at the cutting edge of technology	–	Firm performance
Hult, Hurley, and Knight (2004)	Firm-centric	Innovativeness	The firm's capacity to engage in innovation—that is, the introduction of new processes, products, or ideas in the organization	Market orientation, entrepreneurial orientation, learning orientation	Business performance
Tajeddini, Trueman, and Larsen (2006)	Firm-centric	Innovativeness	The willingness and ability to adopt, imitate, or implement new technologies, processes, and ideas and commercialize them to offer new, unique products and services before most competitors	Customer orientation, competition orientation, interfunctional coordination	Performance
Henard and Dacin (2010)	Customer-centric	Reputation for product innovation	A constituent-specific perception of a firm's track record of product innovations, degree of creativity, and potential for continued innovative activity in the future	–	Customer involvement, excitement toward the firm, overall firm image, propensity to pay price premiums, loyalty to the firm, tolerance for occasional failure
Kunz et al. (2011)	Customer-centric	Perceived firm innovativeness	A consumer's perception of an enduring firm capability that results in novel, creative, and impactful ideas and solutions for the market	–	Functional competence, positive affect, cognitive satisfaction, emotional satisfaction, customer loyalty
Rubera and Kirca (2012)	Firm-centric	Firm innovativeness	A firm's receptivity and inclination to adopt new ideas that lead to the development and launch of new products	–	Market position, financial position, firm value
Dotzel et al. (2013)	Firm-centric	Service innovativeness	The organizational capability or propensity to introduce innovations	Effort intensity, organizational slack, financial leverage, firm size and age, market size and growth	Customer satisfaction, firm value, firm risk
Ngo and O'Cass (2013)	Firm-centric	Innovation capability	The application of knowledge and skills embedded within the routines and processes of the firm to perform innovation activities	–	Customer participation, service quality, firm performance
Tsai and Yang (2013)	Firm-centric	Firm innovativeness	A firm's willingness to adopt new ideas.	–	Business performance
Dibrell, Fairclough, and Davis (2015)	Firm-centric	Firm innovativeness	The creation of innovative products, services, or processes	External and internal entrainment	–
Lai, Lin, and Wang (2015)	Firm-centric	Corporate innovation capability	–	Organizational strategy and structure, R&D talent and technology, environmental uncertainty, stakeholders	Corporate sustainability
Lin (2015)	Customer-centric	Perceived retailer innovativeness	A customer's perception of a firm's ability to provide new products, services, and promotions.	–	Satisfaction, reputation, purchase intentions
Alexiev, Volberda, and van den Bosch (2016)	Firm-centric	Firm innovativeness	The capacity to introduce new products and services	Environmental turbulence, market heterogeneity, competitive intensity, interorganizational collaboration	–
Foroudi, Jin, Gupta, Melewar, and Foroudi (2016)	Customer-centric	Innovation capability	The ability of a company offering a product or a service to create a strong position in a high-potential market	–	Reputation, loyalty
Lin (2016)	Customer-centric	Perceived retailer innovativeness	A convenience retailer's ability to innovate.	–	Perceived value, patronage intentions
Pappu and Quester (2016)	Customer-centric	Brand innovativeness	The degree to which consumers perceive a brand to be innovative	–	Perceived quality, brand loyalty
Yeh (2016)	Customer-centric	Service innovation	A firm's receptivity and inclination to adopt novel ideas that lead to developing and launching new products	–	Customer advocacy, customer participation, relationship quality, customer-perceived value
Filser et al. (2018)	Firm-centric	Firm innovativeness	A firm's ability or capacity to innovate	Family functionality, socioemotional wealth	–
Hubert et al. (2017)	Customer-centric	Perceived brand innovativeness	Consumers' subjective assessments of a brand as being innovative	Perceived flagship product innovativeness, perceived typicality	Intention to buy, willingness to pay
Wang and Dass (2017)	Firm-centric	Innovation capability		Top management innovativeness, firm resources, industry competition	Firm performance

(*continued on next page*)

Table 2 (*continued*)

Study	View	Key concept	Definition	Antecedents	Consequences
			A firm's ability to generate, accept, and implement new ideas, processes, products, or services		
Bairrada et al. (2018)	Customer-centric	Brand innovativeness	Consumers' perceptions of a brand as innovative due to its systematic approach to the generation of creative solutions to market opportunities, such as introducing new designs, product attributes and marketing approaches	–	Brand uniqueness, brand prestige, perceived value, brand love, brand loyalty, word of mouth, willingness to pay a price premium
Sirdeshmukh et al. (2018)	Customer-centric	Search engine reputation for innovation	A consumer's overall evaluation of a provider's creativity and novelty	Search engine value, aesthetic performance	Loyalty intention, user commitment
Strohmeyer, Tonoyan, & Jennings (2018)	Firm-centric	Firm innovativeness	The number of different domains in which a firm has developed something new and the frequency and novelty of its offerings	Entrepreneur's gender	–
Alegre and Pasamar (2018)	Firm-centric	Firms innovativeness	A firm's capacity to engage in innovation—that is, introduction of new products, new processes, or new marketing or organizational methods	–	–
Kim et al. (2018)	Customer-centric	Perceived restaurant innovativeness	A business's broad activities that show capability and willingness to consider and institute "unique" and "meaningfully different" ideas, services, and promotions from customers' perspectives when selected from alternative activities	–	Customer satisfaction
Lin (2019)	Customer-centric	Perceived retailer service innovativeness	The degree to which a consumer perceives a retailer's ability to offer service innovations	–	Perceived service advantage, customer emotional satisfaction, customer attitude, patronage intentions
Stock, Groß, and Xin (2019)	Firm-centric	Product program newness	The extent to which a firm's product program differs from the existing alternatives	Top executives' selfism, hypercore self-evaluation, overconfidence, and innovative work behavior	–
Ozdemir, Kandemir, Eng, and Gupta (2020)	Firm-centric	Firm innovativeness	Firms' capability of introducing new products in the market	Legal bonds, technological turbulence, vertical stakeholder integration, operational linkages	New product performance, firm performance
Wrede and Dauth (2020)	Firm-centric	Firms innovativeness	A firm's tendency to engage in and support new ideas, novelty, experimentation, and creative processes that may result in new products, services, or technological processes	Top management team internalization, CEO age	–
Ghanbarpour and Gustafsson (2022)	Customer-centric	Perceived firm innovativeness	A firm's ability to continuously address consumers' needs and preferences	–	Customer satisfaction, financial performance

companies rather than specific characteristics of concrete products (e.g., Gustafsson et al., 2020; Höflinger, Nagel, & Sandner, 2018; Kim, Tang, & Bosselman, 2018; Lemon & Verhoef, 2016; Lin, 2015). As customer experience consists of cognitive, emotional, behavioral, sensorial, and social responses to interactions with the firm and its offerings (Lemon & Verhoef, 2016), shaping these interactions provides possibilities for the firm to influence the customer's value creation process (Grönroos, 2011; Grönroos & Voima, 2013) and hence the customer's perceptions of the firm's innovativeness and relative attractiveness in the market.

2.2. Theoretical model and hypotheses

In our study, we follow the customer-centric view that builds on the value creation literature, where innovation is conceptualized as a customer-perceived change in how customers and firms co-create value (Michel et al., 2008a, 2008b), with value being the customer's overall assessment of "consequences arising from a solution that facilitate or hinder achievement of the customer's goals" (Macdonald, Kleinaltenkamp, & Wilson, 2016, p. 96). Customer-perceived value can be either positive or negative (Echeverri & Skålén, 2011), and it emerges in the value creation process that comprises three spheres: 1) the provider sphere (closed to customers), where firms produce resources to be used by customers; 2) the customer sphere (closed to firms), where customers use resources and create actual value for themselves; and 3) the joint sphere (the intersection of the provider and the customer spheres), where firms and customers co-create value, that is, together create value in interactions (Grönroos & Voima, 2013). With respect to innovation, the provider sphere functions as an arena for developing new solutions of potential value, whereas the customer sphere covers the customer's use of new solutions independently of the firm (Grönroos, 2017). As innovations by definition imply changes in the joint sphere, the introduction of such changes becomes the firm's means of directly and actively influencing the customer's value creation (Grönroos, 2017; Grönroos & Gummerus, 2014).

The value creation literature suggests that firms can introduce changes in the joint sphere by (1) proposing new value to customers, (2) changing the way in which customers actualize value, (3) (re)configuring relationships with customers, and (4) (re)designing the physical/virtual space of interaction (Grönroos & Voima, 2013; Gummesson, 2007; Holmqvist, Visconti, Grönroos, Guais, & Kessous, 2020; Michel, Brown, & Gallan, 2008b; Payne & Frow, 2014; Payne, Storbacka, Frow, & Knox, 2009). These four dimensions of the joint sphere (i.e., value proposition, value actualization, relationship experience, and interaction space) address the *what*, *how*, *who*, and *where* of the joint sphere and resonate well with specific dimensions that have been identified in particular contexts. For example, in the retail industry, customers

perceive differences between product-related innovations (e.g., new product assortment), service-related innovations (e.g., new self-service technology), promotion-related innovations (e.g., new promotions), and experience-related innovations (e.g., new shopping atmosphere) (Lin, 2015; Omar, Kassim, Shah Alam, & Zainol, 2021). In the restaurant industry, the corresponding dimensions include menu innovativeness (e.g., new menu items), technology-based service innovativeness (e.g., online ordering tools), promotional innovativeness (e.g., a new rewards program), and experiential innovativeness (e.g., a new physical design) (Kim et al., 2018; Teng & Chen, 2021).

In this study, we hypothesize that customers' perceptions of changes along the four dimensions of the joint sphere affect their perceptions of firms' innovativeness. Furthermore, we hypothesize that perceived changes in the joint sphere and perceived firm innovativeness affect customers' perceptions of firms' relative attractiveness. Fig. 1 depicts our overall research model, while the following subsections present in detail the theoretical reasoning behind the hypothesized links.

Importantly, we do not make any assumptions about change valence in the joint sphere for two reasons. First, the fundamental innovation characteristics are the novelty and extent of the change, not its positive or negative outcomes (e.g., Schumpeter, 1934). Second, defining innovation as a positive change would exclude changes that customers dislike and introduce customer satisfaction as a confounding notion into the concept of innovation. Although innovations are often seen as improvements from the managerial perspective (assuming that managers do not purposefully introduce negative outcomes or failures), this may not be the case from the customer perspective. Furthermore, it is not reasonable to expect that even when customers "uniformly" recognize a change in the joint sphere, they should also share a uniform opinion of the change's valence.

2.2.1. Effects of perceived changes in the joint sphere on perceived firm innovativeness

Changes in value proposition. From a firm perspective, value proposition is the promise of the benefits of value that customers will receive (Payne & Frow, 2014). Being presented in the joint sphere by a firm, a value proposition reflects the potential of a transaction, but it is up to the customer to determine whether a specific value proposition corresponds to their needs and results in the value they expect (Vargo & Lusch, 2004). Accordingly, from the customer perspective, value proposition is a subjective assessment of a firm's offer to address one's specific wants and needs (Rintamäki, Kuusela, & Mitronen, 2007). This implies that customers assess the consequences of interacting with a company relative to their goals (Macdonald et al., 2016) or to the fundamental issues they need to resolve in a given situation (Christensen et al., 2016).

Companies often innovate to create or enhance their value propositions by improving the characteristics or performance of their offerings (Aaker, 2007). When a firm introduces changes at the product or attribute level, this may affect customers' perceptions of the firm's value proposition (Varadarajan, 2018). As value proposition is the main reason behind customer–firm interactions, it is likely that when customers perceive changes in a firm's value proposition, they adjust their perception of the firm's innovativeness. We expect that firms that introduce new solutions (e.g., expanding the range of services and launching new products) or significantly modify their existing solutions (e.g., adding new functions) to the extent that customers notice significant changes in the firms' value propositions will be perceived as more innovative.

H1. Perceived changes in value proposition are positively associated with customers' perceptions of firms' innovativeness.

Changes in value actualization. As a symbol of prospective benefits, a value proposition "exists" only as a potential to be actualized (Gummesson, 2007). This actualization implies the deployment, or integration, of resources to create value. From the firm perspective, value

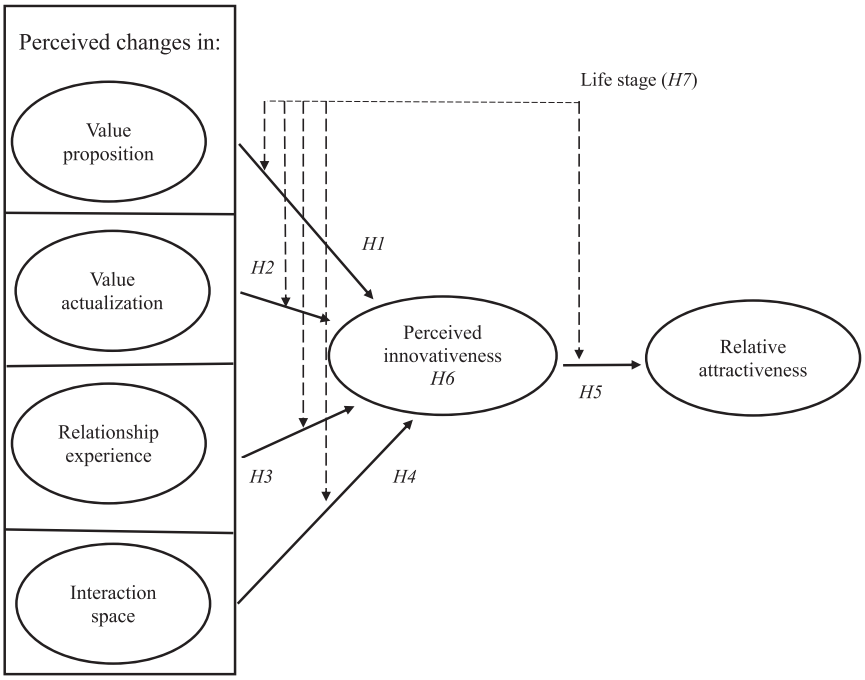

Fig. 1. Antecedents and consequences of perceived firm innovativeness.

actualization primarily occurs through firm processes, such as production, logistics, marketing and sales, and customer service (e.g., Porter, 1985). From the customer perspective, however, value is actualized in the customer usage process through resource integration (Gummesson, 2007; Payne, Storbacka, & Frow, 2008; Vargo & Lusch, 2004).

When a firm introduces changes affecting the resource integration process in the joint sphere, this may have a considerable impact on customers' judgments, competencies, and activities (Dotzel, Shankar, & Berry, 2013; Macdonald et al., 2016; Varadarajan, 2018). For example, changes in service operations due to the introduction of novel mechanisms of service delivery, such as self-service, often influence customers' perceptions of ease, convenience, and efficiency (Meuter, Bitner, Ostrom, & Brown, 2005; Wirtz & Lovelock, 2016). Conversely, customers tend to perceive firms that adhere to outdated processes as being inflexible and having inertia (Macdonald et al., 2016). Therefore, we theorize that firms that modify their resources and processes to the extent that customers notice significant changes in value actualization will be perceived as more innovative.

H2. Perceived changes in value actualization are positively associated with customers' perceptions of firms' innovativeness.

Changes in relationship experience. The main prerequisite for value creation in the joint sphere is that a firm and a customer engage in a relationship (Walter, Ritter, & Gemünden, 2001). From a firm perspective, relationships with customers manifest themselves in building customer loyalty to increase shareholder value (Payne & Frow, 2005; Rust, Lemon, & Zeithaml, 2004). From the customer perspective, however, relationships with firms emerge from experiences of how firms establish, maintain, and enhance interactions with customers (Fournier, 1998; Grönroos, 2004).

Many firms take an active, formal approach to initiating and fostering customer relationships by introducing changes to relationship management and marketing practices (Jarratt, 2008; Morgan & Hunt, 1994; Reinartz, Krafft, & Hoyer, 2004). Such changes may take the form of various marketing and communication programs, notably financial relationship marketing programs (e.g., discounts and free products), social relationship marketing programs (e.g., special treatment, entertainment, and personalized information), and structural relationship marketing programs (e.g., dedicated personnel and customization) (Palmatier, Gopalakrishna, & Houston, 2006). For customers, these changes tend to be emotionally and cognitively engaging, thus influencing their opinions of firms and willingness to actively participate in interactions (Dotzel et al., 2013; Payne et al., 2009). We theorize that firms that innovate in their customer relationship practices to the extent that customers notice changes in relationship experiences will be perceived as more innovative.

H3. Perceived changes in relationship experience are positively associated with customers' perceptions of firms' innovativeness.

Changes in interaction space. From the firm's perspective, the joint sphere requires a company to design a space where firms can interact with customers and directly facilitate their value creation (Grönroos & Voima, 2013; Holmqvist et al., 2020). Historically, interaction space has been equated with the physical environment, where firms could embed various tangible cues in their products (Bloch, 1995) and facilities' exterior and interior (Bitner, 1992). With growing digitalization, interaction space has expanded to include cyberspace (Koernig, 2003), as well as different combinations of physical and virtual environments (van Krevelen & Poelman, 2010).

From the customer perspective, interaction space is the source of various stimuli (e.g., form, graphics, layout, style, and ambient conditions) that affect customers' emotions, cognitions, and behaviors (e.g., Bitner, 1992; Holmqvist et al., 2020; Pullman & Gross, 2004). Although most studies investigate various cues in a given interaction space, there is increasing recognition of the importance of new or modified interaction spaces in explaining the functional, cognitive, emotional, and social aspects of new offerings and in exciting customers (Eisenman, 2013). This implies that a firm can influence its customers' existing schemas and shape their interpretations of the firm and its products through specific design choices for an interaction space (Dion & Borraz, 2017; Rindova & Petkova, 2007). Therefore, we theorize that firms modifying aspects of their interaction spaces so that customers notice significant changes in physical or digital environments will be perceived as more innovative.

H4. Perceived changes in interaction space are positively associated with customers' perceptions of firms' innovativeness.

2.2.2. *Effect of perceived firm innovativeness on a firm's relative attractiveness*

For customers, higher degrees of innovativeness often elicit stronger beliefs about the excitement, utility, and hedonic benefits that a firm can offer through its new products and services (Lowe & Alpert, 2015). Empirical evidence also indicates that category leader and product leader brands tend to belong to more innovative firms (Beverland, Napoli, & Farrelly, 2010), suggesting that perceived innovativeness may serve as a major source of competitive advantage and define a firm's market position. As Aaker (2007) argued, a reputation for being innovative is desirable because it signals the firm's energy, success, and leadership—characteristics that customers are typically attracted to and respect. Innovativeness may also contribute to perceptions of uniqueness and prestige (Bairrada, Coelho, & Coelho, 2018), and regular demonstrations of innovativeness can help maintain and enhance brand equity (Barone & Jewell, 2013). Essentially, by continuously introducing new offerings or improving existing ones, firms influence customers' perceptions of real and future alternatives and, as a result, become more attractive than their competitors in customers' eyes (Andreassen & Lervik, 1999). Conversely, when a firm's competitors introduce innovations that are popular in the market, the firm becomes less attractive and its value decreases (Dotzel et al., 2013). Following this line of reasoning, we theorize that firms perceived as more innovative will also be perceived as more attractive than their competitors.

H5. Perceived firm innovativeness is positively associated with customers' perceptions of firms' relative attractiveness.

2.2.3. *The mediating effect of perceived innovativeness*

By developing and introducing new solutions, firms often aim to differentiate themselves from competitors and become customers' preferred choice (Ngo & O'Cass, 2013). Changes in value propositions can be an effective way of pursuing a competitive strategy, as they can help differentiate brands or even result in the creation of new subcategories, triggering customers' wants and needs (Aaker, 2007). Changes in value actualization can help create unique processes, shape interactions (Wirtz & Lovelock, 2016), and control access to the joint sphere, influencing customers' habits and preventing customer-switching behavior (Hartigh, Ortt, Van de Kaa, & Stolwijk, 2016). Changes in relationship experience can attract and retain customers by, for example, stimulating their feelings of trust, community, getting preferential treatment, or being special (Rust et al., 2004). Changes in interaction space provide immediate cues for differentiating firms, assist in brand recognition, and help create unique settings that are particularly attractive for customers (Bitner, 1992). However, extant literature (e.g., Barone & Jewell, 2013; Henard & Dacin, 2010; Kunz et al., 2011; Lin, 2019) strongly suggest that perceived firm innovativeness mediates the effect of innovations on firms' relative attractiveness, as it functions as a form of customer-based brand equity that increases following new launches and buffers the effects of occasional failures on customers' preference for the firm.

H6. Perceived firm innovativeness mediates the effect of perceived changes in the joint sphere on firms' relative attractiveness.

2.2.4. *Moderating effects of customers' life stages*

Existing research focusing on customers' attitudes toward innovation indicates that customers' age may influence the relationship between perceived firm innovativeness and relative attractiveness (e.g., Arts,

Frambach, & Bijmolt, 2011; Meuter et al., 2005;). However, evidence remains inconclusive, as studies have demonstrated both negative (Lambert-Pandraud & Laurent, 2010; Laukkanen, 2016) and positive (Peine, van Cooten, & Neven, 2017; Steenkamp & Burgess, 2002) effects of age in innovation contexts. Seeking to provide a socioeconomic rather than biological explanation, Andreassen, Lervik-Olsen, and Calabretta (2015) suggested that customers' life stages may be more salient than age in moderating customers' perceptions of innovation. They found three distinct life stages that reflect different needs, preferences, and frames of reference, defining customers' perceptions of the value creation process. The first life stage, "Young, free, and simple," describes young people who study or work and live by themselves or with their partner, typically without children. Their behavior is characterized by prioritizing quantity of life in the form of diverse activities and variety seeking in private, professional, and social arenas (Lambert-Pandraud & Laurent, 2010). Therefore, changes in value proposition may be the strongest factor in determining customers' consideration set and selection of providers in this life stage. The second life stage, "Chaos in my life," describes middle-aged people with dynamic professional and family life, typically with children. To be able to cope with the daily workload and family routines, these customers prefer efficiency and effectiveness in value creation (Andreassen et al., 2015). In this life stage, the strongest factor in determining firm innovativeness and attractiveness may be changes in value actualization. Finally, the life stage "Got my life back" describes elderly adults who tend to have a more stable and predictable lifestyle, with relatively more time, higher disposable income, and less price sensitivity. Their consumption of services and goods is dominated by preferences for quality of life and more stable relationships with companies (Helm & Landschulze, 2013). In this life stage, changes in relationship experience may be the strongest factor in determining firm innovativeness and attractiveness.

H7. Consumers' life stage moderates the relationships between perceived changes in the joint sphere, perceived firm innovativeness, and relative attractiveness.

3. Methods

3.1. Empirical context and data

As our ambition was to test the theoretical model in various contexts, we balanced our sampling strategy in terms of depth and breadth, ensuring the representativeness of both respondents and companies across time and markets. We collected our data in Norway in three phases—the pre-study, the pilot study, and the main study—beginning with surveys in the last quarter of 2015 and the first quarter of 2016, followed by a "rolling" survey that collected data throughout 2016. Norway has an advanced, open economy and a modern social democratic society with citizens who are well integrated internationally. The country is characterized by high demand for innovation, in large part due to high levels of income and purchasing power, which provide the population with the flexibility to try out new offerings while pushing firms to introduce new solutions to increase efficiency and decrease high labor costs (Organization for Economic Co-operation and Development, 2017).

We conducted all our data collection through Ipsos, one of the world's leading data collection agencies, whose respondent pool is well established and one of the largest in Norway. Our respondents formed a nationally representative sample of the Norwegian population aged 18 years or older. As all our constructs were experience-based, our respondents had to be customers of the companies that they were evaluating in the questionnaires. Therefore, each respondent first received a list of companies and had to indicate which companies they used. Based on their answers, they received the questionnaire from a maximum of three companies randomly selected from the list of the companies that they used. In all phases, we sampled approximately 100 respondents per company. Response quality was ensured by the collecting agency's internal procedures and routines; standard procedural remedies for common method bias, namely funneling, separating predictors and criteria, randomizing item order within thematic blocks, explaining the importance of providing conscientious answers, and ensuring a common understanding of the terms (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003); and additional screening for careless respondents (Meade & Craig, 2012).

For the pre-study, we selected four industries of immediate relevance to customers. In total, 1,293 customers participated in a survey that covered 11 companies with the highest market shares in retail (four companies), banking (three companies), telecommunications (three companies), and postal services (one company). For the pilot study phase, 1,583 respondents participated in a survey that covered 11 companies with the highest market shares in retail (four companies, the same as in the pre-study), telecommunications (three companies, the same as in the pre-study), and e-commerce (four companies).

For the main study, 5,812 respondents participated in a survey that covered 57 companies from 19 industries (including all companies from the previous phases, except for one substitution in banking for market penetration reasons). For feasibility reasons, we did not cover all existing companies in the country. When selecting companies, we relied on the following criteria: (1) companies had to represent industries with the highest proportion of household spending (according to Statistics Norway), jointly accounting for a minimum of 70 % of all household consumption, and (2) companies had to account for a minimum of 70 % of the respective markets in each of the selected industries. Although our approach did not address small entrepreneurial firms, it allowed us to cover companies with the most influence on the market and hence on customers' everyday lives. The final list included banks (three), filling station chains (three), car dealer chains (four), grocery chains (four), pharmacy chains (three), newspapers (four), taxi companies (three), airlines (three), insurance companies (four), hotels (three), furniture chains (four), a home appliance retail chain (one), e-commerce firms (three), public transportation companies (five), clothing retail chains (four), an alcoholic beverage retail chain (one), a postal service (one), a public welfare agency (one), and telecommunications companies (three).

Table 3 provides an overview of the survey respondents' characteristics.

3.2. Variables and measures

Perceived changes in the joint sphere. To operationalize the four dimensions of the joint sphere, we used a multistep procedure. First, we developed an initial set of items based on the existing literature (Bitner, 1992; Lin, 2015; Lovelock & Wright, 2002; Rintamäki et al. 2007; Seiders, Voss, Godfrey, & Grewal, 2007; Sureshchandar, Rajendran, & Anantharaman, 2002; Zolfagharian & Paswan, 2008). We then used nine iterative rounds of item sorting and focus group discussions with customers and academics (including a discussion with a language expert), as well as the first two surveys, to validate our constructs (1,293 and

Table 3
Sample characteristics.

Phases	Pre-test study	Pilot study	Main study
Sample size	1,293	1,583	5,812
Age (%)			
18–30 years	14.2	29.2	17.2
30–59 years	52.3	51.7	58.5
>59 years	33.6	19.0	24.3
Gender (%)			
Female	46.1	54.1	48.0
Male	53.9	45.9	52.0
Education (%)			
Basic	36.8	38.5	40.0
Higher	63.2	61.5	60.0

1,583 respondents, respectively). We purposely avoided positive wording and additionally indicated to the respondents that, in these items, we were asking about the extent of the changes rather than positive or negative evaluations. We also ensured that the wording in the introductory sections was not suggestive of episodic experiences. To reduce the respondents' cognitive load, we framed time in terms of the recent past and not the exact date/period (Bradburn, Rips, & Shevell, 1987; Zenetti & Klapper, 2016), while the survey's rolling nature ensured temporally balanced data collection.

In the questionnaires, we used a 7-point Likert scale for items reflecting latent constructs (Table 4). We measured changes in value proposition using three questions that reflected the extent of customer-perceived alterations in the correspondence between market offerings and customer demands. Four questions measuring changes in value actualization reflected the extent of alterations in the co-creation process (including firms' and customers' actions) as perceived by the customers. To assess changes in relationship experience, we asked three questions about the extent of perceived alterations in customer treatment and communication with the companies. We measured changes in interaction space using three questions about the extent of customer-perceived alterations in physical and digital elements between customers and companies.

Customers' perceptions of firms. To measure perceived firm innovativeness, we used four items from Kunz et al. (2010), reflecting the degree to which customers view a firm as being the first to implement new ideas and offer new solutions in a category or market. Finally, to assess the perceived relative attractiveness of firms, we used four items that indicated the respondents' evaluations of a firm and its offerings compared to those of other similar companies (Andreassen & Lervik-Olsen, 2008).

Moderator. To investigate the moderating effects of life stage, we followed Andreassen et al. (2015) and used age as a proxy, categorizing the respondents into three customer groups: young (under 30 years), middle-aged (30–59), and elderly (over 60). The cutoff of 30 years was based on the mean age of the parents at first birth in Norway (according to Statistics Norway).

Table 4
Measures and confirmatory factor analysis results.

Constructs and indicators	Factor loadings (standard errors)		
	Pre-test study	Pilot study	Main study
Relative attractiveness			
1. To what extent does [FIRM] provide products and services of better value than other similar companies?	0.59 (0.025)	0.55 (0.023)	0.62 (0.013)
2. To what extent does [FIRM] provide products and services of better quality than other similar companies?	0.84 (0.016)	0.81 (0.016)	0.90 (0.007)
3. To what extent does [FIRM] have a better reputation than other similar companies?	0.83 (0.018)	0.87 (0.012)	0.88 (0.007)
4. To what extent is [FIRM] more attractive than other similar companies?	0.81 (0.017)	0.89 (0.011)	0.90 (0.006)
Firm innovativeness			
5. [FIRM] changes the market with its offers.	0.79 (0.017)	0.77 (0.017)	0.84 (0.010)
6. [FIRM] is a very creative company.	0.88 (0.012)	0.89 (0.011)	0.92 (0.011)
7. [FIRM] is a pioneer in its category.	0.85 (0.013)	0.86 (0.013)	0.88 (0.018)
8. [FIRM] is an innovative company.	0.90 (0.012)	0.89 (0.020)	0.91 (0.017)
Changes in value proposition			
9. During the last few months, to what extent has there been a change in how [FIRM]'s offerings match your wants?	0.90 (0.014)	0.92 (0.012)	0.91 (0.009)
10. During the last few months, to what extent has there been a change in how [FIRM]'s offerings meet your needs?	0.88 (0.015)	0.91 (0.013)	0.92 (0.007)
11. During the last few months, to what extent has there been a change in [FIRM]'s overall market offering?	0.84 (0.016)	0.87 (0.015)	0.88 (0.009)
Changes in value actualization			
12. During the last few months, to what extent has there been a change in the way [FIRM] delivers what it offers?	0.90 (0.012)	0.92 (0.012)	0.91 (0.006)
13. During the last few months, to what extent has there been a change in how easy it is to make use of [FIRM]'s offerings?	0.88 (0.012)	0.91 (0.009)	0.89 (0.007)
14. During the last few months, to what extent has there been a change in how quickly [FIRM] delivers what it offers?	0.86 (0.016)	0.91 (0.012)	0.93 (0.005)
15. During the last few months, to what extent has there been a change in your efforts when making use of [FIRM]'s offerings?	0.80 (0.017)	0.81 (0.015)	0.82 (0.009)
Changes in relationship experience			
16. During the last few months, to what extent has there been a change in the way [FIRM] treats you as a customer?	0.92 (0.014)	0.91 (0.029)	0.93 (0.022)
17. During the last few months, to what extent has there been a change in the way [FIRM] takes care of you as a customer?	0.93 (0.017)	0.93 (0.024)	0.93 (0.019)
18. During the last few months, to what extent has there been a change in the way [FIRM] communicates with you?	0.89 (0.017)	0.92 (0.022)	0.92 (0.016)
Changes in interaction space			
19. During the last few months, to what extent has there been a change in the appearance of [FIRM]'s web page or interiors?	0.84 (0.018)	0.91 (0.015)	0.91 (0.007)
20. During the last few months, to what extent has there been a change in the design of [FIRM]'s physical surroundings or digital solutions?	0.83 (0.018)	0.92 (0.013)	0.92 (0.008)
21. During the last few months, to what extent has there been a change in the visual appeal of [FIRM]'s facilities?	0.93 (0.011)	0.92 (0.012)	0.93 (0.007)
	$\chi^2 = 357.35$; $df = 174$; RMSEA = 0.029; SRMR = 0.026; NNFI = 0.990	$\chi^2 = 329.91$; $df = 174$; RMSEA = 0.02; SRMR = 0.027; NNFI = 0.993	$\chi^2 = 543.80$; $df = 174$; RMSEA = 0.019; SRMR = 0.026; NNFI = 0.996

Note. χ^2 = chi-square; RMSEA = the root mean square error of approximation; SRMR = the standardized root mean square residual; NNFI = the non-normed fit index. All loadings are significant, $p < .001$.

4. Results

We applied confirmatory factor analysis and structural equation modeling with robust maximum likelihood estimation using LISREL 10.2 to test the hypothesized relationships (Jöreskog, Olsson, & Wallentin, 2016). Table 4 provides the results of the measurement model analysis for each study sample. All factor loadings were statistically significant (p <.001) and reasonably high (ranging from 0.62 to 0.93) in the final sample. All three models demonstrated an excellent fit, although chi-square statistics inevitably varied based on differences in sample size. The models posed no convergent or discriminant validity concerns, with composite reliability (CR) for all constructs well above the recommended value of 0.70, average variance extracted (AVE) much greater than 0.50, maximum shared variance lower than the AVE, and the square root of AVE greater than the inter-construct correlations (Hair, Black, Babin, & Anderson, 2010). Table 5 provides construct correlations (standard errors in parentheses) from the confirmatory factor analysis based on the main study sample.

We used the data from the first two studies primarily to establish the validity and reliability of our constructs. To test a causal model of the relationships between the constructs, we used data from the main study. The chi-square test and the alternative fit indices demonstrated an excellent fit ($\chi^2 = 564.56$, $df = 178$; RMSEA = 0.019; SRMR = 0.030; NNFI = 0.995). We followed the standard procedure for testing for mediation effects (Hair et al., 2010). Based on this analysis, we modified the model by including a path relating value actualization to relative attractiveness. The final model (further used in reporting) showed an improved fit ($\chi^2 = 552.11$, $df = 177$; RMSEA = 0.019; SRMR = 0.026; NNFI = 0.996).

As Table 6 shows, the results supported the positive relationships between perceived changes in value proposition (0.25, p <.001), value actualization (0.31, p <.001), and interaction space (0.19, p <.001) and firm innovativeness (Hypotheses 1, 2, and 4, respectively). The results also revealed a strong relationship between perceived firm innovativeness and relative attractiveness (0.70, p <.001), supporting Hypothesis 5. Regarding Hypothesis 3, the relationship between perceived changes in relationship experience and firm innovativeness was significant, but, contrary to the expected direction, negative (-0.16, p <.001). Regarding H6, we found a significant and positive direct effect of perceived changes in value actualization on relative attractiveness (0.08, p <.001), indicating that perceived firm innovativeness partially mediates the effect of changes in value actualization on relative attractiveness. The direct effects of changes in value proposition, relationship experience, and interaction space on relative attractiveness were not significant, indicating complete mediation by perceived firm innovativeness.

To investigate the hypothesized moderation effects (Hypothesis 7), we followed the standard procedure for multigroup analysis with maximum likelihood estimation (Jöreskog et al., 2016). Table 7 presents the main results. In addition to comparing the corresponding estimates across groups, we compared the relative importance of standardized parameter estimates within groups to analyze patterns of influence.

Most of the uncovered relationships between the variables in the model generally held across various customers' life stages. The exception providing partial support to the hypothesis was the association between perceived changes in value proposition and firm innovativeness, which was significantly larger in the "Young, free, and simple" group (0.30, p <.001) than in the "Chaos in my life" group (0.19, p <.001). Moreover, as we tested for differences between total effects within the groups, we found that there was a significant shift in the relative importance of factors within the groups, providing further support for the hypothesis. Although changes in value proposition and value actualization had a similar effect on both firm innovativeness (0.30, p <.001 and 0.24, p <.001, respectively) and relative attractiveness (0.19, p <.001 and 0.25, p <.001, respectively) for the "Young, free, and simple" group, changes in value actualization had a significantly higher positive effect than any other dimension on relative attractiveness for the "Chaos in my life" (0.27, p <.001) and the "Got my life back" groups (0.25, p <.001). For the latter two groups, changes in value actualization (0.28, p <.001 and 0.27, p <.001, respectively) also had a

Table 6
Structural parameter estimates.

Model element	Original model	Final model	Indirect effects (final model)	Total effects (final model)
Model fit				
χ^2	564.56	552.113		
Degrees of freedom	178	177		
RMSEA	0.019	0.019		
SRMR	0.030	0.026		
NNFI	0.995	0.996		
Standardized parameter estimates (with standard errors in parentheses)				
Value proposition → Firm innovativeness	0.25 (0.030)	0.25 (0.030)		0.25 (0.030)
Value proposition → Relative attractiveness			0.18 (0.022)	0.18 (0.022)
Value actualization → Firm innovativeness	0.32 (0.023)	0.31 (0.023)		0.31 (0.023)
Value actualization → Relative attractiveness		0.08 (0.015)	0.22 (0.018)	0.29 (0.021)
Relationship experience → Firm innovativeness	-0.16 (0.032)	-0.16 (0.032)		-0.16 (0.032)
Relationship experience → Relative attractiveness			-0.11 (0.023)	-0.11 (0.023)
Interaction space → Firm innovativeness	0.19 (0.026)	0.19 (0.026)		0.19 (0.026)
Interaction space → Relative attractiveness			0.14 (0.019)	0.14 (0.019)
Firm innovativeness → Relative attractiveness	0.74 (0.020)	0.70 (0.021)		0.70 (0.021)
R2				
Firm innovativeness	0.30	0.29		
Relative attractiveness	0.55	0.55		

Note. χ^2 = chi-square; RMSEA = the root mean square error of approximation; SRMR = the standardized root mean square residual; NNFI = the non-normed fit index.

Table 5
Construct correlations.

Variable	CR	1	2	3	4	5	6
1. Relative attractiveness	0.90	**0.83**					
2. Firm innovativeness	0.94	0.74 (0.010)	**0.89**				
3. Changes in value proposition	0.91	0.39 (0.016)	0.47 (0.015)	**0.88**			
4. Changes in value actualization	0.94	0.42 (0.014)	0.49 (0.014)	0.70 (0.012)	**0.89**		
5. Changes in relationship experience	0.95	0.31 (0.016)	0.38 (0.016)	0.75 (0.014)	0.67 (0.014)	**0.93**	
6. Changes in interaction space	0.94	0.32 (0.015)	0.42 (0.014)	0.64 (0.013)	0.60 (0.013)	0.73 (0.013)	**0.92**
Marker variable (Extent of reading)	–	0.11 (0.018)	0.09 (0.019)	0.02 (0.019)	0.02 (0.018)	-0.06 (0.018)	0.03 (0.018)

Note. CR = composite reliability; diagonal elements (bold) show the square root of the average variance extracted; p values in parentheses.

Table 7
The moderating effects of life stage.

	"Young, free, and simple" (LS 1) β (SE)	"Chaos in my life" (LS 2) β (SE)	"Got my life back" (LS 3) β (SE)	LS 1 vs LS 2 $\Delta\chi^2(1)$	*p*-value	LS 1 vs LS 3 $\Delta\chi^2(1)$	*p*-value	LS 2 vs LS 3 $\Delta\chi^2(1)$	*p*-value
Comparisons of standardized parameter estimates (with standard errors in parentheses) between groups									
Final model (including effects on FI):									
VP → FI	0.30 (0.049)	0.19 (0.028)	0.23 (0.038)	3.88	0.049	1.32	0.251	0.72	0.396
VA → FI	0.24 (0.046)	0.28 (0.026)	0.27 (0.035)	0.55	0.457	0.34	0.562	0.02	0.896
VA → RA	0.10 (0.031)	0.07 (0.015)	0.07 (0.024)	0.59	0.444	0.37	0.545	0.01	0.929
RE → FI	-0.08 (0.050)	-0.11 (0.028)	-0.14 (0.039)	0.22	0.642	0.76	0.384	0.35	0.556
IS → FI	0.18 (0.045)	0.18 (0.025)	0.13 (0.036)	0.01	0.929	0.77	0.381	1.07	0.300
FI → RA	0.64 (0.032)	0.70 (0.017)	0.67 (0.025)	3.71	0.054	1.51	0.219	0.41	0.522
Total effects on RA:									
VP → RA	0.19 (0.033)	0.13 (0.020)	0.16 (0.026)						
VA → RA	0.25 (0.040)	0.27 (0.022)	0.25 (0.031)						
RE → RA	-0.05 (0.032)	-0.08 (0.020)	-0.09 (0.027)						
IS → RA	0.12 (0.029)	0.12 (0.018)	0.09 (0.024)						

	VP vs VA		VP vs IS		VP vs RE		VA vs RE		VA vs IS		RE vs IS	
Comparisons of the relative importance of standardized parameter estimates (with standard errors in parentheses) within groups	Δβ	*p*-value	Δβ	*p*-value	Δβ	*p*-value	Δβ	*p*-value	Δβ	*p*-value	Δβ	*p*-value
"Young, free, and simple"												
Total effects on FI	0.060	0.375	0.122	0.066	0.387	< 0.001	0.327	< 0.001	0.062	0.335	-0.265	< 0.001
Total effects on RA	-0.057	0.270	0.078	0.073	0.247	< 0.001	0.304	< 0.001	0.135	0.006	-0.169	< 0.001
"Chaos in my life"												
Total effects on FI	-0.091	0.017	0.014	0.711	0.299	< 0.001	0.390	< 0.001	0.105	0.003	-0.285	< 0.001
Total effects on RA	-0.132	< 0.001	0.009	0.737	0.210	< 0.001	0.342	< 0.001	0.141	< 0.001	-0.201	< 0.001
"Got my life back"												
Total effects on FI	-0.044	0.394	0.099	0.058	0.379	< 0.001	0.414	< 0.001	0.143	0.005	-0.271	< 0.001
Total effects on RA	-0.098	0.017	0.067	0.060	0.249	< 0.001	0.347	< 0.001	0.165	< 0.001	-0.182	<.001

Notes. VP – value proposition; VA – value actualization; RE – relationship experience, IS – interaction space; FI – firm innovativeness, RA – relative attractiveness; LS – life stage; SE – standard error, χ2 – chi-square.

Table 8
Comparison of alternative models.

Model	BIC	χ^2 (*df*)	RMSEA	SRMR
Model 1 (the final model, Table 5)	1,020.18	552.11 (177)	0.019	0.026
Model 2 (Relative attractiveness → Firm innovativeness → Changes in the joint sphere)	4,017.45	3,610.06 (184)	0.057	0.191
Model 3 (Firm innovativeness → Relative attractiveness → Changes in the joint sphere)	11,889.500	4,162.96 (184)	0.061	0.215

Note. BIC = Bayesian Information Criterion; χ^2 = chi-square; *df* = degrees of freedom; RMSEA = the root mean square error of approximation; SRMR = the standardized root mean square residual.

significantly higher positive effect on perceived firm innovativeness than did changes in interaction space (0.18, p <.001 and 0.13, p <.001, respectively), while for the "Chaos in my life" group, value actualization had a significantly higher positive effect on firm innovativeness than did changes in value proposition (0.19, p <.001).

Assessing method bias and the potential reverse-causality problem. To detect potential method bias, we ran a single-factor model based on confirmatory factor analysis using a variant of Harman's single-factor test (Podsakoff et al., 2003). The model had an unacceptable fit (χ^2 = 21,626.69, *df* = 189; RMSEA = 0.140; SRMR = 0.158; NNFI = 0.761). Moreover, we applied the marker variable technique (Podsakoff et al., 2003; Williams, Hartman, & Cavazotte, 2010) using a variable that was selected a priori as a part of quality assurance and measured by asking respondents to indicate the extent of reading through all content (Table 5). In line with methodological recommendations (Williams et al., 2010), the variable was theoretically unrelated to substantive variables but was measured on the same scale and administered together with other items. Confirmatory factor analysis with the marker variable under the assumption of common method variance demonstrated a significantly worse fit ($\Delta\chi^2$ = 49.50; Δdf = 5; p <.001) and no change in factor loadings or construct correlations. These checks suggest that common method bias was unlikely to influence our results.

Considering the cross-sectional nature of our data, we also addressed the possibility of reverse causality by assessing competing non-nested models. Structural equation modeling is especially suitable for such model comparisons (Merkle, You, & Preacher, 2016). As the chi-square difference test does not directly apply to testing non-nested models, we followed the established tradition of using either the Akaike information criterion (AIC) or the Bayesian information criterion (BIC), with lower values indicating better models (Kline, 2011). We chose BIC because it is a stricter measure that penalizes for sample size and a lack of parsimony.

Table 8 presents two alternative models built using the hypothetical assumption that perceptions of changes in the joint sphere may potentially result from respondents' opinions of firms rather than vice versa (e.g., Kim, Kim, Garett, & Jung, 2015). More specifically, Model 2 assumes that customers might see a firm they are attracted to as being more innovative and, as a result, introducing more changes. Model 3 assumes that relative attractiveness drives stronger perceptions of perceived changes. As Table 8 further demonstrates, the model with the originally hypothesized directionality was clearly better than the two alternative models in terms of the BIC and the overall fit. Although such

a check cannot rival experimental designs, it provides additional support for the robustness of our theoretical underpinnings.[2]

5. Discussion

In contrast to the firm-centric view focusing on organizational antecedents of firm innovativeness (e.g., Mendoza-Silva, 2020; Saunila, 2020), customer-focused innovation research is driven by the idea that firm performance depends on what customers think about firms' innovation efforts (Ghanbarpour & Gustafsson, 2022). However, existing research has been limited to examining such customer responses as satisfaction and loyalty (e.g., Kunz et al., 2011; Pappu & Quester, 2016; Sirdeshmukh, Ahmad, Khan, & Ashill, 2018) and has explicitly or implicitly assumed that customers establish their perceptions of firm innovativeness by discerning new changes at the attribute or product level (Hubert et al., 2017; Zolfagharian & Paswan, 2008). In this study, we developed a novel approach to measuring innovations as customer-perceived changes in the joint sphere and examined their effects on customers' perceptions of firms' innovativeness and relative attractiveness. We demonstrated that changes in value proposition, value actualization, and interaction space positively influence perceived firm innovativeness, but changes in relationship experience have a negative effect. Perceived firm innovativeness, in turn, has a positive impact on firms' relative attractiveness.

5.1. Theoretical implications

Our study makes several contributions to the literature by broadening the emerging understanding of what happens in the customer space between firms launching their innovations and reaping the results. First, it offers a novel look at the antecedents of perceived firm innovativeness and firm attractiveness and is the first to do so from a value creation perspective. In particular, our study provides an empirically validated instrument for measuring customers' perceptions of changes in value creation introduced by firms in the joint sphere. In contrast to studies examining customers' perceptions of innovation in specific industries (Kim et al., 2018; Lin, 2015; Omar et al., 2021; Teng & Chen, 2021), our study's constructs and measurement instruments are industry-agnostic, which enables their broad use in future research. Moreover, in contrast to industry-specific studies, we analytically separated overall innovativeness and the dimensions in which innovative changes manifest themselves, which enables a more detailed examination of the mechanism underlying customers' responses to firms' innovations.

Second, this study offers a perspective that goes beyond the traditional one-on-one relationship between a customer and a firm and underlines satisfaction-based research on innovativeness. Using the starting point that customers' assessments of focal firms should be seen in relation to other market players (Keiningham et al., 2015), our study is the first to demonstrate that customers' perceptions of firm innovativeness guide their comparisons of competing firms. According to our findings, innovative firms are generally perceived as more attractive than their competitors, which suggests that perceived firm innovativeness should be regarded as providing firms with a major competitive advantage in terms of differentiation. Coupled with previous findings on the positive associations between perceived firm innovativeness, customer satisfaction, and loyalty (Kunz et al., 2011; Lin, 2015; Pappu & Quester, 2016), our study strongly supports the idea that perceived firm innovativeness is a critical driver of a firm's brand equity and customers' preference for a specific firm (Aaker, 2007; Beverland et al., 2010).

Third, our study provides new insights into customers' views on the effectiveness of innovation. Firm-focused innovation studies have occasionally attempted to evaluate the effectiveness of different forms of innovation, most prominently product and process innovations (e.g., Gunday, Ulusoy, Kilic, & Alpkan, 2011; Lee, Lee, & Garrett, 2019). However, the results have been inconclusive because of complementarities between innovation forms (Ballot, Fakhfakh, Galia, & Salter, 2015). Instead of following the traditional form-based approach to differentiating innovations, our study used customers' experiences of changes in the joint sphere, which essentially shift the research focus from the form of innovation to its functional role in value creation. As our results show, changes in value actualization have the largest total effect on relative attractiveness, but the patterns of customer reactions to changes in the joint sphere vary across customers' life stages. The finding that customers at "Chaos in my life" and "Got my life back" life stages are particularly attracted to firms introducing changes in value actualization resonates well with the idea that in their choice behavior, these two age segments focus on the efficiency, effectiveness, and quality of solutions rather than their variety (Andreassen et al., 2015). In this regard, our findings contradict those of previous research, which suggests that age may negatively affect customers' appreciation of firm innovativeness (e.g., Gilly & Zeithaml, 1985; Im, Bayus, & Mason, 2003; Lambert-Pandraud & Laurent, 2010). In our study, customers across all life stages evaluated innovative firms as more attractive, but it appears that a life stage-related shift in customer views occurs regarding what "innovative" means, with "Chaos in my life" and "Got my life back" customers appreciating changes in the way value is actualized more than changes in the value proposition itself. This difference in meanings may explain earlier findings on mature customers preferring new solutions from familiar brands but increasingly neglecting new brand alternatives (e.g., Helm & Landschulze, 2013).

Moreover, our study uncovers the negative effects of changes in the relationship experience dimension, which might appear counterintuitive at first. However, given that building customer relations is a complex, time- and resource-consuming process (Payne et al., 2009), it may be logical that customers react negatively when established relations change significantly, probably prompting feelings of distrust. Previous research has already reported that, at least for customer loyalty, satisfaction with established customer relationships may matter more than perceived relationship improvements (Leverin & Liljander, 2006). In light of our valence-independent approach to innovation, our finding is even more striking and may indicate a mismatch between firms' relationship management efforts and customers' preferences, especially in the digital environment. Apparently, firms often introduce relationship innovations in their own interests—for example, by introducing switching barriers or using customer data and machine learning to nudge customers to buy more, buy more often, or lock in. This may not be what customers perceive as innovative. Our findings may also indicate customers' sensitivity and reluctance to accept changes regarding their personal space and information privacy—as also reflected in data misuse scandals, such as the Cambridge Analytica case—as well as increased public attention to data security (e.g., the implementation of the General Data Protection Regulation). To convince customers, managers often resort to marketing tools, but attempts to improve customers' perceptions of firm innovativeness through marketing efforts alone are inefficient and may be detrimental (Höflinger et al., 2018).

[2] Following feedback in the review process, we ran additional analyses with industry as a control variable, using a version based on the statistical industry classification reported in this article and a version based on sectoral categories from Castellacci (2008)'s taxonomy. The results remained robust, and differences in parameter estimates between the final model (Table 5) and each of these models were, on average, 0.02 and 0.01, respectively. However, we did not include industry control in the main study, as extant evidence suggests that customers classify industries differently than statistical services or researchers (e.g. Bowen, 1990), but a comprehensive customer-based industry classification is currently lacking. The results of the additional analyses can be obtained from the authors.

5.2. Managerial implications

Our study offers a customer-centric innovation resource allocation strategy for maximizing innovation benefits and, eventually, improving firm value. By investing and innovating in areas that facilitate positive customer reactions, firms may improve their perceptions as innovative companies, which strengthens the attractiveness of a company relative to its competitors and ensures the loyalty of existing customers, as well as the attraction of new ones. Over time, these positive mechanisms increase customer lifetime value and customer equity. However, when making decisions about how to allocate innovation funds, managers must consider customer segments and their value-creation processes. Particularly careful consideration should be given to the analysis of how innovation can potentially influence customers' perceptions of their relationship experiences with the firm. As our study shows, current marketing practices and innovation practices in relationship management worsen customers' perceptions of firms' innovativeness and consequently reduce firms' relative attractiveness. In theory, this may lead to further decreases in customer retention, customer lifetime value, customer equity, and firm value. However, our findings do not imply that customers do not want innovations in relationship experience; rather, they reflect a need for firms to adopt the role of an agent acting on customers' behalf. This implies that the firm (agent) should always aim to innovate in the customers' best interests, even if this entails sacrificing some immediate income. To succeed in achieving this aim, understanding how new products, services, and processes affect customers' perceptions and behaviors is essential.

Our findings suggest the importance of implementing a customer-based measure of innovativeness in assessing firms' innovation efforts. Such a measure can usefully complement traditional customer metrics centered on quality and satisfaction. Whereas customer satisfaction measures describe a static condition and reflect the quality-level variance of a company's market offerings, our customer-based innovation measure provides insights into the dynamic processes behind perceived changes in the joint sphere. Therefore, our measure may provide important strategic insights for managers and policymakers. Customer-based innovation indices that rely on our methodological approach have been implemented in Norway, the USA, Sweden, Finland, Denmark, Belgium, and Spain, with other countries showing interest. Combining the information from these customer-based innovation indices with data from customer satisfaction indices could provide a unique overview of a company's strategic position in the market, assisting in strategic decision making.

5.3. Limitations and future research

In designing our study, we followed the classic approach to investigating customers' perceptions of firms and brands (e.g., Fornell, Johnson, Anderson, Cha, & Bryant, 1996; Johnson, Gustafsson, Andreassen, Lervik, & Cha, 2001; Kunz et al., 2011). Although this approach is well established and provides solid support for our theory, future experimental studies can provide further and deeper insights into the causal relationships and mechanisms uncovered in our study. It would be particularly interesting to see studies using innovative solutions as treatments to understand how their attributes affect perceptions of changes in the joint sphere. Similarly, it would be interesting to investigate the impact of information cues and promotions related to innovation launches. Examining different innovation types could also be of interest. For example, digital, environmental, and social innovations deserve special attention in the age of digitalization and growing concerns for sustainability.

Given that we relied on the principle of parsimony in developing our research model, it would be interesting to explore the extensions of our model in future research. For example, future studies could investigate the role of emotions in mediating the effects of changes in co-creation dimensions on perceived firm innovativeness and relative attractiveness. Another research opportunity involves examining the financial consequences of a firm's relative attractiveness, especially compared to explanations based on the more traditional satisfaction–loyalty relationship (e.g., Ghanbarpour & Gustafsson, 2022).

Due to resource constraints, we prioritized the firms whose products families spend most of their household income on. Future research focusing on start-up companies and companies with low market penetration may help acquire broader knowledge of perceived firm innovativeness. Although the comparability of the Norwegian population to other populations in developed countries suggests the generalizability of results, we would encourage replication of the study in other contexts. In addition, our study focused only on life stage as a moderating variable; other demographic, psychographic, and socioeconomic characteristics—for example, ethnic identity, income, customers' technology readiness (Parasuraman, 2000), involvement (Zaichkowsky, 1985), and need for uniqueness (Tian, Bearden, & Hunter, 2001)—could serve as worthwhile moderating variables in future studies.

CRediT authorship contribution statement

Seidali Kurtmollaiev: Project administration, Methodology, Formal analysis, Conceptualization, Data curation, Writing – original draft, Writing – review & editing. **Line Lervik-Olsen:** Project administration, Conceptualization, Formal analysis, Methodology, Writing – review & editing. **Tor W. Andreassen:** Resources, Project administration, Conceptualization, Writing – review & editing.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix B

Honey or condensed milk? Improving relative brand attractiveness through commercial and social innovations

Seidali Kurtmollaiev, Line Lervik-Olsen, and Tor W. Andreassen

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ABSTRACT

By defining what a corporate brand is and stands for, managers influence the brand's attractiveness in the eyes of the customers. Although many corporate brands still follow the traditional price-quality positioning approach, the growing demand for innovative solutions, sustainable practices, and digital experiences has considerably challenged the established brand landscape. In two quantitative studies and one qualitative study, this chapter examines whether corporate brands can win over their competitors by prioritising one of these areas in their strategy.

The first study demonstrates that consumers perceive innovative brands as significantly more attractive than non-innovative brands. Although innovative brands are also more attractive than brands that are purely socially responsible, prioritizing investments in social and environmental innovations is the best strategy. The second study shows that brands using digital innovation to generate social innovations are in a better strategic position than brands prioritizing social innovation alone or brands implementing digital solutions for merely operational or commercial reasons.

The third study uncovers significant discrepancies in meanings and understandings regarding brand innovativeness between managers and consumers as well as among consumers. A solution lies in managers facilitating close cooperation throughout all stages of the innovation process, cultivating multiple forms of communication and evaluating social and environmental outcomes of innovation together with various stakeholders.

Honey or condensed milk? Improving relative brand attractiveness through commercial and social innovations

Seidali Kurtmollaiev, Line Lervik-Olsen, and Tor W. Andreassen

And when Rabbit said, 'Honey or condensed milk with your bread?' he was so excited that he said, 'Both,' and then, so as not to seem greedy, he added, 'But don't bother about the bread, please.'

– A. A. Milne, Winnie-the-Pooh

1. Introduction

On the one hand, corporate brands face daily market demands on innovation, especially in light of intensified competition. Consumers want novel and unique experiences, and letting competitors offer them that without a fight is the surest way out of the market for a brand. On the other hand, worsening social and environmental problems obligate all market players to actively take care of people and the planet.

In the first stage of the COVID-19 pandemic, many firms made radical changes in their market offerings and refocused their corporate brands to contribute to the common battle against the virus. For example, fashion brands like Louis Vuitton and Prada fabricated face masks and medical gowns, while alcohol and perfume brands like Pernod Ricard, Old Fourth Distillery, and Guerlain converted their production lines to produce hand sanitisers. In addition to helping local communities, such brands found an opportunity to efficiently counteract plummeting returns early in the pandemic. Another example of social responsiveness is many brands' support for Black Lives Matter, the social movement against racially motivated violence. Major market players such as Apple, Netflix, Twitter, Nike, and Citigroup took a clear stand on the issue, with Nike releasing a socially conscious message 'For once, don't do it,' which was reposted by other brands, including Converse and Nike's main competitor, Adidas. Although most corporate brands eventually return to their core value propositions, such activities reflect managers' increased understanding of the importance of socially responsible behaviour and its positive ripple effects. This demonstrates the long way modern companies have come since the first corporations, such as the Dutch East India Company and East India Company, which were actively involved in the slave trade, armed conflicts, corruption, and looting of resources.

Taking a stand may not be easy, especially when it concerns controversial issues (Schmidt et al., 2021). The negative responses that Gillette received for the campaign 'We Believe in the Best in Men' or Stormberg for its support of the World Wide Fund for Nature's 'Save Our Wolves' campaign in Norway are reminders of how complex and uncontrollable societal debates can be. They demonstrate that brand-associated social and environmental practices engage both consumers and non-consumers, which contrasts with more traditional relations between brands and individual consumers founded on sales and product usage. Moreover, society's growing

expectations for socially responsible business practices leave little doubt that merely taking a stand or running a campaign is not enough. Traditional corporate and social responsibility in the form of philanthropy or reactive attempts to address negative externalities caused by the firm's activities are also insufficient. Instead, society requires that sustainability be deeply ingrained in all business aspects, from operations to offerings. The notion of the 'triple bottom line,' coined in 1997 by John Elkington, seems to have finally left the realm of wishful thinking to instead reflect real-world practices.

Having a distinct, relevant, and desirable corporate brand is the keystone to a firm's survival as the whole purpose of branding is to attract consumers' attention by increasing the salience of corporate characteristics and forming corporate associations (Brown & Dacin, 1997; Keller, 1998). With approximately 300,000 and 700,000 trademarks registered every year in the United States and Europe, respectively (according to World Intellectual Property Organization), having a brand that is attractive to consumers is essential. An attractive brand engages consumers who may not only like the brand but even identify with it (Marin & de Maya, 2013; So et al., 2017). Consumers also tend to remain loyal to brands they are attracted to and downplay negative information about them, forgiving mistakes (Elbedweihy et al., 2016). In turn, consumers switching to another brand indicates that the original brand is failing to meet their expectations, which anticipates the firm's loss of income and market share (Al-Kwifi & Zafar, 2015).

Many studies have attempted to uncover the factors that make brands attractive. Evidence suggests that corporate brand attractiveness may increase when an organization explicitly constructs and communicates distinctive brand characteristics as if they were human personality traits – the so-called 'brand personality' – with the focus on expertise and competence (Brown & Dacin, 1997; Sophonsiri & Polyorat, 2009). For example, when a brand's target audience is homogeneous, a targeted way to improve brand attractiveness is to express brand personality and values congruent with the particular customer segment (Elbedweihy et al., 2016). In this chapter, we discuss how firms can build attractive corporate brands by expressing actual innovativeness and social and environmental responsibility. We introduce the notion of relative brand attractiveness, arguing that brand success is better explained when brand attractiveness is conceptualized in relative rather than absolute terms. We present three studies on relative brand attractiveness using empirical data from the Norwegian Innovation Index (NII) – the world's first customer-based ranking of innovative firms, which has been adopted in the United States (since 2018), Sweden (2019), Finland (2020), and Denmark (2021). Following a carefully designed procedure, the NII captures firms' innovations and customers' perceptions of changes in value co-creation resulting from these innovations. The main informants are a nationally representative sample of the Norwegian population aged 15 years or older. Through a professional bureau, our research team has collected more than 23,000 responses annually from customers of approximately 80 corporate brands in 20 industries since 2016. The publicly available result is the annual rating and ranking of major corporate brands in Norway across various sectors based on innovativeness, relative attractiveness, and customer loyalty. Although the NII builds upon the assertion that the customer is the final judge of innovations, it also acknowledges that innovations are launched by firms. To capture firms' actual launches, the NII team annually conducts an additional qualitative study in which the marketing directors of firms on the ranking list present concrete changes they made in the previous

year. Customers participating in the main quantitative study also have an opportunity to share their thoughts on companies' activities in a text field, allowing direct comparison of managers' and customers' perspectives on innovation based on the actors' own reflections and vocabulary.

In the first study, based on quantitative data, we show that innovative corporate brands are more attractive than their competitors and that sustainability initiatives increase the brand's chances of being perceived as innovative. In the second study, also based on quantitative data, we find that social innovations generally have a stronger relationship with perceived innovativeness than digital innovations, but that digital innovations have a positive impact on social innovations. In the third study, based on qualitative data, we explain why innovations that managers believe will be interesting and relevant for consumers are often not viewed as such by the consumers. Finally, we discuss the sustainable approach to building an innovative corporate brand and the role of shared understanding in this process.

2. Building relative brand attractiveness: being first or doing right?

2.1. Defining relative brand attractiveness

Brand attractiveness refers to consumers' positive evaluation of a brand's distinctive and relatively enduring characteristics (Bhattacharya & Sen, 2003; Currás-Pérez et al., 2009). According to Bhattacharya and Sen (2003), consumers are likely to perceive a brand as attractive when it satisfies one of their self-definitional needs – that is, self-continuity (maintaining a stable and consistent sense of self), self-distinctiveness (distinguishing the self from others in social contexts), and self-enhancement (seeing the self in a positive light). The authors suggest that managers can make a brand attractive by ensuring its similarity to consumers' identities, its distinctiveness in characteristics valuable to consumers and its prestige. Firms with appealing brands can charge premium prices, achieve higher profitability and better access to investments, and attract stronger job applicants (Fombrun & Shanley, 1990). Consumers are also typically more satisfied with such brands and tend to trust and praise them (Walsh & Beatty, 2007). As a result, it has traditionally been assumed that by creating an attractive brand and ensuring consumer satisfaction, firms can reduce incentives for brand switching and gain more loyal consumers (Bhattacharya & Sen, 2003; Johnson et al., 2001).

Although this assumption seems intuitive, it omits the fact that the market includes multiple players and that consumers form associations and derive experiences based on their interactions with many firms on the market. A brand can be attractive in itself, but consumers will be less loyal if competing brands are equally or more attractive (Sirohi et al., 1998). Therefore, instead of thinking about brand attractiveness in absolute terms, it is crucial to focus on the brand's relative superiority with respect to its competitors (Andreassen & Lervik, 1999). As the literature suggests, relative brand attractiveness may play a major role in resisting brand-switching behaviour (Al-Kwifi & Zafar, 2015) and be more efficient in securing the firm's market share and share of wallet than product usage and customer satisfaction (Shukla, 2004; Keiningham et al., 2015).

We define relative brand attractiveness as the extent of consumers' positive evaluation of the brand's distinctive and relatively enduring characteristics in relation to competing brands. As a subjective, perception-based measure, this concept describes a consumer attitude that is holistic

and not necessarily in accordance with specific objective data. For example, consumers may evaluate a brand as more attractive even when competing offerings have lower prices, higher quality, or more stylish designs because the focal brand has a better congruence with the consumers' beliefs or context of use. As Vargo and Lusch (2016) state, 'value is always uniquely and phenomenologically determined by the beneficiary' (p. 8).

2.2. Innovation as a way to increase brand attractiveness

Innovation is the principal motor behind the creation and maintenance of the most distinctive brand characteristics, and the association between brand distinctiveness and innovativeness tends to be empirically strong (e.g., Wong & Merrilees, 2008; Corkindale & Belder, 2009). Essentially, brands provide strategic focus to the development of new solutions and support the introduction and adoption of innovations, while innovations influence brand perception and attitude (Brexendorf et al., 2015). As an enduring characteristic, corporate brand innovativeness does not build upon specific and singular product launches or product attributes but upon regular innovation activities over time (Kunz et al., 2011), reflecting the firm's reputation in reliably developing and introducing creative solutions (Brexendorf & Keller, 2017). For corporate brands, being perceived as innovative often equates to being modern and up-to-date (Gürhan-Canli & Batra, 2004; Henard & Dacin, 2010). An innovative brand signals characteristics such as energy, leadership, success, and a pioneering nature, which are typically attractive and desirable to consumers (Aaker, 2007). Innovativeness also signals higher utility and various positive emotions, including excitement, astonishment, adventurousness, happiness, delight, and satisfaction, that consumers may experience when they interact with the brand (Kunz et al., 2011; Lowe & Alpert, 2015; Thompson et al., 2005). Moreover, an innovative brand engages its consumers, who start to identify with it, feel passionate about it, and actively participate in its community (Yen et al., 2020). They may even forgive or positively view the brand's deviations from category norms and regard these deviations as a positive sign of innovation efforts (Barone & Jewell, 2013).

Many corporate brands explicitly try to position themselves as innovative to increase customer loyalty (Henard & Dacin, 2010). Yet when a brand regularly introduces new offerings, consumers assess them against competing alternatives. If the novel characteristics are more valuable than what is on the market, consumers may see the brand as more attractive than its competitors (Andreassen & Lervik, 1999). Conversely, when competing brands launch successful innovations, the focal brand becomes less attractive (Dotzel et al., 2013). Existing theory suggests, therefore, that corporate brand innovativeness may play a key role in building and maintaining relative brand attractiveness.

In addition to having expectations about innovation, consumers are becoming conscious of the negative effects of the products they buy and use. They want to contribute to responsible production and consumption and, as evidence suggests, are increasingly attracted to brands that are socially responsible (e.g., Marin & Ruiz, 2007; Currás-Pérez et al., 2009). Some consumers use ethical values to construct their identities, associating themselves with an ethical consumption community and avoiding brands that embody the values of consumerist society (Papaoikonomou et al., 2016). Accordingly, Kay (2006) has suggested that a corporate brand's first step to becoming strong, attractive, and connected to consumer values should be creating a link to social

responsibility. Many businesses already recognize that they must become more sustainable to avoid being ignored or outright rejected by their stakeholders. According to the Global Sustainable Investment Alliance, in 2019, the sustainable investment market reached USD 30.7 trillion in developed countries alone (68% increase since 2012), indicating the attractiveness of sustainable brands to not only customers but also investors.

2.3. Innovation vs. social responsibility

Neither innovation nor social responsibility comes for free, and a firm with limited resources may find it challenging to decide which of these areas to prioritize in resource allocation. To test which investment strategy focus – innovation or social responsibility – is the most effective in increasing brand attractiveness, we used structural equation modelling on the 2016–2017 NII data from 2,612 respondents. The respondents answered questions about their perceptions of the 15 largest Norwegian brands in five consumer-facing industries (banking, telecommunication, retail, online shopping, and postal services). To measure perceived brand innovativeness and social and environmental responsibility, we used items from Kunz et al. (2011) and Walsh and Beatty (2007), respectively. For relative brand attractiveness, we relied on Andreassen and Lervik-Olsen (2008), asking respondents to compare the brand of interest to competing brands and indicate the extent to which it offered better-value and higher-quality products and services, had a stronger reputation, and was more attractive.

Our finding is that the direct effect of perceived innovativeness on relative brand attractiveness is much stronger than that of perceived social responsibility, with standardized beta b = .62 (standard error S.E. = .09) and b = .17 (S.E. = .04), respectively. Innovative brands are simply more attractive. However, this does not mean that innovativeness trumps social responsibility. Although the modest effect size of perceived social responsibility aligns with previous findings on the relationship between brand ethicality and brand equity (Iglesias et al., 2019), our result comes with a twist. While the direct effect of brand social responsibility on relative brand attractiveness is not remarkably high, the total effect is about three times larger because, as our data show, consumers tend to perceive socially responsible brands as more innovative (b = .57, S.E. = .06). In other words, perceived innovativeness partially mediates the effect of perceived social responsibility on relative brand attractiveness. Although prioritizing innovation in general may seem to be a good strategy, firms that prioritize investments in responsible innovation may achieve higher yields due to the combined effects of being perceived as both socially responsible and innovative.

This finding raises another question: can firms strategically aim for this effect by focusing on the areas in which consumers are best able to discern responsible innovation? When firms innovate for consumers, they introduce significant changes in their market offerings, which, in turn, primarily affect consumer perceptions of brand innovativeness, social responsibility, and attractiveness. To test these effects in our study, we concentrated on two major areas in which consumers could experience changes directly – value proposition and interaction space. Value proposition – the promise of benefits that a brand offers to satisfy consumer needs or, from the customer perspective, the promise of an experience that consumers will receive from engaging with the brand (Payne et al., 2017) – is the cornerstone of the relationship between brand and consumer. Examples of such benefits and experiences are eventual knowledge and employment in

the case of educational institutions, positive emotions, and memories in the case of amusement parks or a low-cost, environmentally friendly transfer between locations in the case of public transportation. We use the term interaction space to describe all physical and digital touchpoints that contribute to the brand experience, such as physical surroundings and products, equipment, webpages, and mobile applications.

According to our analysis, changes in value proposition have positive effects on both perceived brand innovativeness (b = .20, S.E. = .03) and social responsibility (b = .27, S.E. = .04), with the latter effect being larger. This suggests that changes in value proposition do not have to be about the environment or society to prompt perceptions of brand innovativeness (and, hence, attractiveness). If they are, however, the total effect is considerably larger. Moreover, changes in interaction space do not have a significant direct effect on innovativeness, but they positively affect the perception of social responsibility (b = .22, S.E. = .04), indirectly influencing perceived innovativeness. This means that firms have a better chance of succeeding if they, for example, change the design of their brand-related physical and digital environment for environmental or social reasons rather than for purely aesthetic ones. The latter type of change may have no noticeable effect on brand attractiveness.

Overall, responsible innovation seems to be a winning strategy for increasing brand attractiveness in relation to competing brands.

3. Bits and bytes or people and rights?

3.1. Digital innovation

Building a brand's innovative image is not easy. 'Innovativeness' as a brand characteristic is intangible and hard to evaluate, and as a notion, it has multiple interpretations. The most straightforward and reliable way to influence consumers' perceptions of a brand's innovativeness is to regularly launch innovations that consumers can experience. As we have shown, prioritizing socially responsible innovation may be a good choice for corporate brand strategy, which may not come as a surprise as society increasingly expects and demands companies to invest in social innovation. However, recent years have also witnessed an unprecedented increase in the scope and scale of digital transformation, which has prompted society's expectations and demands regarding the use of digital technologies and solutions. The COVID-19 pandemic has demonstrated that the general population has matured regarding the use of digital solutions, whether to order items online for home delivery, run professional meetings and social events, or visit museums. In addition to solving consumer problems and enabling new brand experiences, digitalization offers opportunities for cost-cutting and efficiency improvement, mainly due to the steadily decreasing costs of digital components and broad diffusion of digital devices (Fichman et al., 2014). In fact, digital innovation is becoming the primary driver of business innovation, and a number of companies have strategically stated that they are prioritizing digitalization to achieve their business goals (Nylen & Holmström, 2015). Could focusing on digital innovation rather than social innovation be a better choice when building the image of an innovative corporate brand?

In a broad sense, digital innovation involves a new product, process, or business model embodied in or enabled by information technology (Fichman et al., 2014). This embodying or enabling can

take various forms, with information technology playing a facilitating role (e.g., enabling access to information and communication or simplifying transactions), serving as the context (e.g., e-commerce) or being a product or service itself (e.g., software, cloud services) (Huang & Rust, 2013). Most firms pursue digital innovation to optimize their operations and/or improve brand experience, which makes the firm's production and sales the focus areas for digital innovation. Firms that embrace social innovation have a broader focus on various stakeholders and even non-stakeholders, including actors who are outside the target audience of the brand's value proposition, non-human animals and natural environments.

Although both digital and social innovation are important, the discrepancy between the amount of digital innovations and the amount of social innovations, the tremendous success of digital players (e.g., Google, Amazon, Facebook, Uber) and the popularization of terms such as digitalization, digital transformation, digital revolution, and industry 4.0 demonstrate where business priorities currently lie. Even a simple Google Images search with the keyword innovations results in images that represent digital, not social, advances. From the traditional managerial perspective, it may seem easy to decide between investing limited resources in something with clear economic benefits (e.g., cost reduction, product improvement, the creation of new revenue streams) and something that may have only a potential social or environmental impact and no apparent economic returns. The decision becomes easier when managers consider a reporting timeframe: the impact of digital innovations is likely to be visible much sooner. In the eye of the profit-oriented manager, digital innovations are simply a better choice. In some cases, they have even become a requirement, for example, due to government regulations or industry standards.

Digital innovation has had a tremendous impact on consumers as well, and it is hard to find a single aspect of their everyday lives that it has left untouched. Easy access, low switching costs, and countless alternatives are some reasons why digital innovations have prompted a new type of consumption – the 'liquid consumption' (Bardhi & Eckhardt, 2017). In contrast to the more traditional, 'solid' consumption, with its focus on owning brands with a stable performance, liquid consumption relies on renting and sharing, and it favours accessibility over stability. Examples include consumers choosing online music streaming platforms over CD and MP3 players or bicycle-sharing and carsharing systems over owned vehicles.

Despite the omnipresence of digital innovations, little is known about how they affect brand associations. Digital environments can be conducive for cultivating relationships between consumers and brands as well as among consumers considering the numerous possibilities for establishing and maintaining one-to-one, one-to-many, and many-to-many communication patterns. Nowadays, having a webpage that allows consumer feedback (e.g., comments, ratings) or engaging with consumers through community fora is commonplace. Yet the same environment can also be destructive for brand relationships given the burgeoning variety of alternatives 'just one click away,' the virality of electronic word-of-mouth and little incentive to remain loyal to online brands (Olsen, 2018). In this context, ensuring high relative brand attractiveness through innovation becomes crucial not only to entice new consumers but also to retain existing ones. By regularly launching new digital solutions, brands have the chance to keep pace with a changing market and stay innovative in the eyes of the consumer. It is also reasonable to assume that

consumers who perceive their current brand of choice to be innovative and at the forefront of technological development will have less feeling of 'the grass being greener on the other side.'

3.2. Digital innovation vs. social innovation

By nature, digital innovation differs from social innovation in how it influences brand positioning. As new digital solutions primarily provide functional gains (e.g., timesaving, cost-cutting, increased ease of use, seamlessness), by engaging in digitalization, firms essentially secure and strengthen the functional positioning of their brands. Digital innovations may also contribute to the elaboration of brands with experiential concepts. Social innovations, however, can offer little, if any, functional or experiential benefits to individual consumers directly. For example, a typical household in the United States using Unilever products may see no personal benefit in Unilever and Acumen's joint initiative 'Social Innovation Challenge on Plastics,' which focuses on lifting waste pickers in other countries out of poverty. Similarly, Patagonia's free reparation of damaged clothing to promote environmental protection may bother some consumers because of logistical inconveniences, waiting time or the fact of having to wear repaired clothes. Instead of individual consumers' needs, social innovations target broader social, cultural, economic, and environmental conditions, producing positive outcomes predominantly at the aggregate level (Pol & Ville, 2009). Such positive outcomes include improved education and environmental quality, longer life expectancy, greater gender equality, community development, and poverty alleviation. Consequently, instead of functional benefits or direct personal gains, individual consumers typically associate social innovations with the common good and emotional benefits (e.g., warm-glowing), which creates a foundation for symbolic and emotional brand positioning (Bhat & Reddy, 1998; Hartmann et al., 2005).

It has long been assumed that brand management should focus on a specific concept (e.g., functional or symbolic) and rely on a corresponding positioning strategy and marketing mix (Park et al., 1986). For example, it has been regarded as inappropriate to apply a brand positioning strategy suitable for managing a brand with a functional concept to managing a brand with a symbolic concept or to combine several concepts because such inconsistent branding could lead to consumer confusion and poor differentiation from competitors. Empirical evidence on this issue remains inconclusive, with some studies favouring a focused approach (e.g., Esmaeilpour, 2015; Delgado-Ballester & Sabiote, 2015) and others finding a combination of several strategies more advantageous (Hartmann et al., 2005).

To test how positioning brands as regularly introducing digital or social innovations affects brand innovativeness and relative brand attractiveness, we used structural equation modelling on the 2019 NII data, consisting of 10,836 responses to 79 corporate brands in 19 industries. We measured associations related to digital innovations with items that indicated the extent to which the firm's product and services could be described as digital, the extent to which the respondents applied digital technology when they bought and used the firm's offerings, the extent to which digital solutions were used in the communication between the respondent and the firm, and the extent to which the respondent associated the firm with advanced digital technologies. To capture associations related to social innovation, we relied on items that described the degree to which corporate brands provided solutions positive for the environment and society, prioritized doing

good for the environment and society and regularly presents new solutions to social and environmental problems. To measure perceived brand innovativeness and relative brand attractiveness, we used Kunz et al. (2011) and Andreassen and Lervik-Olsen (2008).

The analysis confirmed our previous finding that perceived brand innovativeness is a critical success factor for relative brand attractiveness (b = .78, S.E. = .01). We also find that, in line with existing theory, both digital and social innovations positively affect perceived brand innovativeness. We were, however, surprised to find that, concerning brand innovativeness, the effect size for social innovations is more than five times larger than the effect size for digital innovations: the standardized coefficients are .73 (S.E. = .03) and 0.14 (S.E. = .02), respectively. With minor variability, this finding holds across various industries and consumer age groups, providing evidence for social innovations as a highly effective focus of corporate brand strategy.

Does this mean that corporate brands should abandon focusing on digital innovation in favour of social innovation? Our analysis indicates that the answer is 'no' because digital innovation significantly and positively impacts social innovation (b = .58, S.E. = .01). In other words, digital innovation can increase the chances of succeeding with social innovation, and using digital innovation to generate and diffuse social innovations is a much better strategy than either implementing digital solutions for merely operational and commercial reasons or prioritizing social innovation alone. Mediated by social innovation, the indirect effect of digital innovation on perceived brand innovativeness (b = .42, S.E. = .02) is three times higher than its direct effect. Corporate brands that have the best of both worlds treat digital and social innovations not as mutually exclusive but as complementary.

4. Getting it right

4.1. Juxtaposing manager and consumer views on innovativeness

A history of successful innovations is a prerequisite for a corporate brand to develop an innovative reputation. While managers do not introduce innovations with the objective of making them fail, up to 70–90% of new fast-moving consumer goods disappear from the market within one year after launch (Gourville, 2006). For most corporate brands, any innovation flop risks inducing a storm of negative reactions and significant losses, including reputational damage (Barone & Jewell, 2013). Although managers tend to justify innovation failures by blaming consumers for demonstrating low demand for new products and services (Eurostat, n.d.), we see the actual reason for the mismatch between how managers and consumers interpret innovation.

Innovation practice and research have traditionally prioritized the managerial perspective, but there have long been calls to cover both external and internal stakeholders' perceptions in the analysis of corporate brands (Morsing & Kristensen, 2001). These calls have led to the emergence of a stakeholder-driven perspective that rejects the old-fashioned view of managers as having full control over brand identity and instead considers corporate brand meanings as co-created by multiple stakeholders (Iglesias et al., 2020). Consumers in particular have received a more central place, being recognized as active brand value co-creators (Merz et al., 2009). Often, consumers perceive different values in the same brand (Michel, 2017) and construct their own contexts in

both physical and digital spaces in ways that brand managers may have not even considered (Ramaswamy & Ozcan, 2016).

To analyse how consumers and managers construct meanings about brand innovativeness, we conducted a qualitative study using the 2016 and 2017 NII data (Kurtmollaiev et al., 2018). We examined nine main players in three different industries in Norway: the airline industry (Scandinavian Airlines, Norwegian, Widerøe), banking industry (DNB, Nordea, Sbanken), and retail industry (Meny, Rema 1000, Coop Extra). For each corporate brand, we compared qualitative interviews with marketing directors with the qualitative part of the NII survey of consumers. We interviewed the directors about what kind of innovations they launched in their corporate brands and when, while consumers provided descriptions of their experiences with the brands and commented on observed changes. In total, we analysed comments from 1,255 airline passengers, 1,229 bank consumers, 1,683 retailing consumers, as well as one marketing director from each market player. In addition to value proposition and interaction space, we also considered two further dimensions of value co-creation – value realization and relationship experience. Value realization refers to the co-creation of value through the resource integration process, which includes how products and services are delivered and how consumers use them. For a bank, examples of value realization would be the various processes it uses to deliver its services to consumers through online banking, ATM or front office, as well efforts that consumers make, including the use of various devices and self-service solutions. Relationship experience reflects the extent to which consumers feel taken care of and how a corporate brand communicates with its consumers. For a retail store, examples of relationship experience include loyalty programs, employees' behaviour towards consumers, and the company's communication strategy (e.g., tone of voice). Table 13.1 summarizes the study examples of the companies' innovations and the consumers' perceptions of the changes in the respective dimensions of value co-creation.

Table 13.1 The comparison of the firm's innovation activities and the consumers' perceptions of innovations

Dimensions of value co-creation	Industry	Firm's innovations	Consumers' perceptions of firm's innovations
Value proposition	Bank	Upgrade of stock trade	'The bank's new solution for buying and selling stocks was very bad in the beginning. Now it is better.' 'Stock trading has become too difficult on a tablet.'
	Retail	Change in the assortment of products	'Richer selection of vegetarian and healthy food.' 'Vegan selection.' 'They have expanded the selection of vegetarian and vegan food considerably.'
	Airline	New destinations	'They have started new routes.' 'New routes, but also shutdown of some of the existing routes.' 'They have destinations that I want to travel to. It is possible that I will adjust my travel plans based on where they fly directly to.'
Value realization	Bank	Update and streamlining of processes, the removal of several manual processes, efficiency improvements	'They are faceless to me, and we do most of the work ourselves.' 'Services go by themselves.'
	Retail	Online ordering system, home delivery, self-checkouts	'New self-checkouts. Online store.' 'Have started to shop a lot in the online store.' 'They have a self-service solution for payments. It means they are going to reduce the number of employees. Many young people have got jobs and work experience through working in stores. I would rather pay a few kroners extra than to allow store jobs to be removed for the younger generation.'
	Airline	Digitalization, automatization, more self-service online, and the efficiency improvements in the complaint process	'Little progress in online solutions. Poor feedback in the complaint process.' 'Easier and more intuitive online solutions.' 'Better and faster solution on expense refunds for cancellations.'
Relationships experience	Bank	New customer segmentation ('from younger to older, from those with significant money to those with less	'I shall go away from this bank who is not interested in having me as a customer.' 'The client managers did not take care of me as a VERY loyal customer.'

Dimensions of value co-creation	Industry	Firm's innovations	Consumers' perceptions of firm's innovations
		money'), changed service delivery in physical branches	'They have introduced "office hours," which irritates me terribly. After all, without their consumers, the bank can just forget it all!' 'Closed doors and booking of appointments to get into the bank.'
	Retail	Change of the existing communication form, bonus solutions for users, more active online interaction	'Discounts in the app.' 'Coupons, the app's discounts.' 'Over-polite staff that says 'bye' before I have even packed my purchase.'
	Airline	Transition to a consolidated operational customer relationship management for all sellers, support and customer service	'The fantastic chat-function that is available 24/7 from everywhere in the world.' 'Service and safety, good communication with customers and with other airline companies.'
Interaction space	Bank	Reduction in the number of physical branches	'Shutdowns of local branches.' 'They have moved out of the city centre.' 'They close down local branches in excess.' 'Closed offices, and, therefore, they are bankrupt in my eyes.'
	Retail	New design of the app, the continuous refurbishment of the stores	'The store is very changed, and the app is updated.'
	Airline	webpage has received new design and better and smarter solutions	'The dreadful, ugly and useless new webpage.' 'They have got a CONSIDERABLY worse webpage and online solutions!' 'The webpage. They are totally tragic. Went from bad to worse!'

4.2. What managers do is not what consumers see

As we find, the way consumers recognize and perceive innovations is neither one-sided nor straightforward. Although consumers notice changes, they may not register them as separate innovations but associate them with changes in either the total brand experience or parts of it. More importantly, the perception of changes can vary significantly between not only consumers and managers but also consumers. This is largely because consumers see changes in a particular context that includes social and natural surroundings, the consumers' backgrounds, and the consequences of the changes. In this context, consumers may develop such strong attitudes and emotional reactions that they start engaging for or against changes. Although this engagement tends to decrease gradually over time, it can have a considerable impact on the corporate brand reputation, as well as the firm's financial results and even survival.

The perception of the distinctiveness of change

Unless a change occurs in the whole business model, innovations normally take the form of a specific outcome, such as the removal of a manual process, change of the assortment, introduction of a new loyalty programme, or launch of new webpage. In some cases, novel solutions replace existing ones, whereas in other cases, the old and the new elements coexist. Regardless of the form, managers retain a clear distinction between the 'old' and 'new' in their products, services, processes, programmes, and facilities. However, although consumers notice changes (and may even mention specific examples), they do not see innovations 'in a vacuum.' Instead, they evaluate how their experience with the brand changes as a result of those innovations. For example, they evaluate a new webpage based on how much faster and easier it is to obtain information or place orders, a new stock trade system as more or less complicated, and updated processes as allowing slower or faster problem-solving. Overall, customers assess the change based on the extent to which they perceive that the execution of a 'job-to-be-done' (Christensen, 2016) is better or worse than before. This evaluation is crucial for consumers' perceptions of a corporate brand as creative and innovative.

Consumers' emotional reactions to change

In most cases, consumers not only notice innovations cognitively but also experience emotional reactions, which are sometimes strong. What is interesting from both theoretical and practical perspectives is that consumers may have similar perceptions of the type and extent of change, but their emotional responses to it can be very diverse. For example, most consumers notice when a firm increases its degree of self-service. Some consumers respond positively to the change, feeling that it gives them more control and causes less interaction with the firm's employees. However, for the same reasons, other consumers may perceive the change as negative: they lose the opportunity to interact with people, making the corporate brand faceless in their eyes. Differences in interpretations invoke an entire spectrum of emotions. For example, some consumers react calmly to changes in their bank service, perceiving the changes as a natural and logical development and banks as everyday things 'like milk and bread' to which they 'have no emotional relations.' Other consumers can be so 'terribly irritated' that they describe their banks using strong vocabulary and eventually end their customer relationship.

Duration of the effect of a change on consumers' emotional reactions and perceptions

When we analyse consumers' reactions over time (since we collect our data on a rolling basis), we observe that the intensity of emotions decreases and subdues after a while. For example, when the Norwegian grocery chain REMA 1000 launched its mobile app Æ in January 2017, it had a considerable impact on our respondents. In a pre-launch campaign, the brand tried to build suspense in an Apple-like manner but failed to deliver a unique value proposition. This led to a stream of negative reactions from users, despite the fact that the app was of good quality. Almost all respondents reacted with dissatisfaction and anger after the launch. Yet our data indicate that the number of Æ-related comments gradually decreased during the year, being replaced with comments about the firm's offerings, physical surroundings in the stores, price, and customer service. The app has remained part of the REMA 1000 shopping experience. A similar example is

Scandinavian Airlines' launch of a new webpage in spring 2017. Consumers initially described the new webpage in a negative manner, but after several months, they started to focus on other aspects of the company's service.

Differences in interpretations of change between consumers and managers

Our data show that managers and consumers can interpret (and frame) changes very differently. Usually, managers see their innovations in a positive light, but consumers' views are more varied. For example, managers typically communicate automatization and digitalization as optimization, whereas consumers interpret them as cost-cutting, using consumers as a free labour force, and as a sign of organizational greed. Managers may present segmentation as the opening of a new market, whereas consumers may interpret it as discrimination and neglect. In addition to such qualitative differences in interpretations, we observe differences in the perceptions of the extent and amount of changes. While managers often claim that they introduce numerous innovations, consumers assert that there are too few change attempts in corporate brands.

The role of context in perceiving changes

These differences are the result of a bigger phenomenon: the impact of context on the perception of changes. For managers, the innovations that they launch are mainly related to one context – their operations and sales – which also defines employees' beliefs, attitudes, and interpretations. Consumers, however, find themselves in different situations and use the same products and services from different starting points, with their situations, backgrounds, and relationships having a critical effect on their perception of changes. When consumers evaluate brand innovativeness, they tend to merge the evaluation of the change with its consequences. This holistic evaluation depends on consumers' backgrounds and social relations. Consumers may associate changes in value position (for example, the introduction of new food products by grocery chains or new destinations by airlines) with either disregard or support for local environments and communities. They may interpret changes in value realization (for example, the introduction of self-service solutions) based on labour market situations and unemployment rates. They may see changes in relationship experience (for example, new communication forms) in light of common assumptions about corporate strategy and managers' intentions and evaluate changes in interaction space (for example, new webpage design) with respect to contemporary aesthetic standards and expectations of functionality.

What do these differences in managers' and consumers' perceptions mean for corporate branding? A corporate brand that engages in numerous innovation initiatives is not necessarily viewed as innovative by its consumers. In some cases, the intended effect does not reach consumers simply because corporate brands poorly communicate their innovations. For example, in many cases, consumers need not only information about new offerings but also 'training' in how and when to use new solutions. The main reason for weaker brand innovativeness, however, is that consumers find meaning not in innovation initiatives per se but in their results in a context. Hence, corporate brands that are able to introduce changes that improve the total brand experience are perceived as more innovative. To achieve this, managers need to recognize consumers' beliefs, preferences, and emotions in a wider social context and learn how to communicate using consumers' own language,

which implies taking an 'outside-in' perspective. Conversely, innovating without regard to the customer perspective may have damaging effects on customers' perceptions of brand innovativeness.

When managers plan to introduce an innovation, they need to evaluate what effect it will have on the total brand experience. As with any other change, innovations can provoke strong emotional reactions, which can vary along both positive-negative and active-passive dimensions. There is a difference between a dissatisfied customer and an angry customer, as well as between a satisfied customer and an excited customer. These variations often have a strong impact on brand reputation and a firm's financial results. Even cautious consumers can become excited when they see and understand the benefits of innovations. Yet this strategy works only if consumers' and managers' perceptions of innovations align. If consumers and managers have conflicting views about changes, excited consumers can easily become angry consumers, which usually has a negative impact on the corporate brand. This effect can aggravate if managers intentionally create excitement around the launch, but the extent and relevance of the innovation is low from the customers' perspective, as happened in the case of REMA 1000's shopping app.

Although it might seem that managers can influence consumers' perceptions of changes relatively easily through marketing communication, this alone is not sufficient. Often, the change is defined not only by the choice of words and communication form but also by the consumers' own interpretations of the change in light of various contexts. This implies that the success of innovation depends on a deep understanding of individual and social circumstances. Managers can develop such an understanding through direct observations and interviews with consumers in particular contexts, which also require an open mind-set and empathy (Leonard & Rayport, 1997; Brown, 2008). By recognizing the uniqueness of each customer's interpretation and building a conversational space in which individual customers and the organization come together, managers can strategically capitalize on the multiplicity of views, suggestions, and ideas (Iglesias et al., 2013). In cases where the managers have insufficient knowledge about consumer contexts, it may be wise to reduce innovation visibility or introduce changes gradually.

5. Conclusions: finding balance in brand innovativeness

Few, if any, now believe that an economy in which we extract resources from the planet and process them in factories to create goods that we throw away after use is sustainable. Yet that is what we have done and still do. Today's mass production of cheap consumer goods produces substantial waste – more than ever – and the quantities are growing. According to the World Bank, the total amount of waste in 2016 was approximately two billion tons and is estimated to be 3.4 billion tons in 2050. Of this, only 16% is recycled. No less disturbing is the slow progress in solving social challenges. About 10% of the world's population lives in poverty and is undernourished, and 30% is without safely managed drinking water. Income inequality within and between countries, violence, political instability, and armed conflicts are on the rise, whereas access to quality education and job opportunities remains very limited.

In this context, innovation is a somewhat double-edged sword. It has, in many ways, contributed to the development of an unequal, 'throw-away' society worldwide by multiplying offerings,

triggering consumer wants and needs and affecting income distribution (e.g., Aghion et al., 2019). At the same time, innovation is also the best available tool to improve our lives and eradicate social and environmental challenges. These two sides – commercial and social – are nearly impossible to separate, and our analysis indicates that there is little to gain in trying to do so. Commercial and social innovations are like Winnie-the-Pooh's honey and condensed milk, with consumers preferring to have both.

As Figure 13.1 illustrates, focusing on either commercial (including digital) or social innovation is myopic, whereas engaging in neither suggests stagnation. A sustainable strategy is to balance commercial and social innovations: after all, economic viability, social equity, and environmental protection are the three pillars of sustainability. The balanced approach can take the form of using knowledge, experience, and resources gained from commercial innovation in social innovation initiatives. It may also involve initiating only commercial innovation projects that have clearly defined positive outcomes for society and the environment. From the corporate branding perspective, this approach clearly pays off because the most innovative brands, in the eye of the consumer, are those with a sustainable innovation strategy. Consumers consider such brands more attractive than competing brands. Hence, brands that regularly launch both commercial and social innovations have a higher chance of becoming the consumer's first choice and enjoying high customer loyalty.

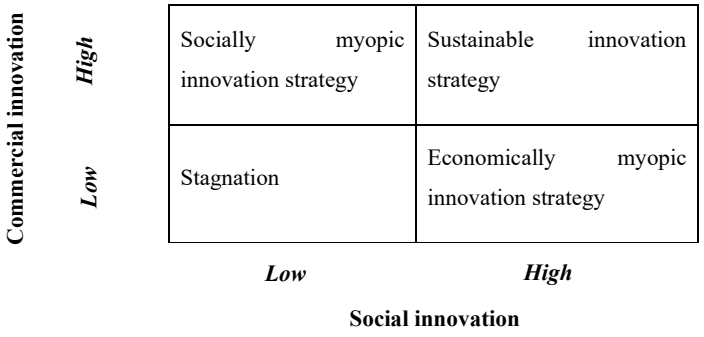

Figure 13.1 Innovation strategies depending on innovation type

It is important, however, to remember that managers and consumers may have different understandings of innovation. A commercial innovation that managers see as unanimously and universally positive may provoke anger and frustration in consumers looking at it through their social lenses. A social innovation that managers may dismiss because it does not promise immediate pecuniary results could secure consumers' loyalty in the long run. Realizing the importance of social innovations but unwilling to fully embrace them, many brands resort to deceptive communication as an easy fix: so as not to seem greedy, they try to appear innovative and concerned about the environment or society. A typical example is 'colourwashing' (e.g., greenwashing, pinkwashing, brownwashing) – that is, the practice of communicating

unsubstantiated values in activities, products, and services to become more attractive to socially and environmentally aware consumers. Such practices grossly underestimate consumers. As our analysis shows, consumers are relatively good at perceiving innovations, even those related to the corporate backstage, and are not only able to detect fraudulent communication but also much better at contextualizing innovations than managers. This means that managers have to be genuine and more diligent in embracing a conscientious approach to addressing market needs, desires, and feedback (Iglesias & Ind, 2020). Instead of maintaining the illusion of having full control over the development of innovation and brand meanings, managers should aim to effectively facilitate the co-creation of meaning through multiple stakeholders (Iglesias & Bonet, 2012). This can be done by strategically using conversational spaces specifically designed to promote collaborative interactions among stakeholders. As previous evidence suggests, stakeholders often gladly engage in co-creation because it provides them with an opportunity to find fulfilment, create shared meaning and socialize (Ind et al., 2013). By closely cooperating throughout all stages of the innovation process, cultivating multiple forms of communication and diligently evaluating social and environmental outcomes of innovation together with various stakeholders, managers can significantly improve their corporate brands' positioning and odds of market success (Ind et al., 2017). More importantly, such cooperation can genuinely contribute to creating a better future for all.

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"If you cannot measure it, you cannot manage it" is an old management saying. On the national level, the existing sources of systematic information on innovation efforts and innovation performance typically rely on macroeconomic indicators. This top-down and inside-out perspective neglects the experiences and opinions of innovation recipients. Recognizing that it is customers' adoption and usage decisions that determine the success of new products and, ultimately, of innovators themselves, a research team at NHH – Norwegian School of Economics and the research center Digital Innovations for Sustainable Growth (DIG) developed the world's first outside-in and bottom-up approach to evaluating innovation efforts – the Norwegian Innovation Index (NII), which was launched in 2016.

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