# *Examining the Effect of Perceived Brand Innovativeness on Customer-Based Brand Equity*

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## *Abstract*

This research investigates the effects of Customer-perceived brand innovativeness (C.P.B.I.) on Customer-Based brand equity (C.B.B.E.). The research consists of four main phases. In the first step, the factors affecting the subject were extracted through the study of research literature. By studying the research literature and examining the theoretical framework, the influencing factors are divided into five dimensions of C.P.B.I., brand awareness, brand association, perceived quality of the brand, and brand loyalty. The concept of C.P.B.I. including 13 parameters and the concept of C.B.B.E. including 23 parameters were introduced as final factors. Therefore, the conceptual model of the research was presented based on the extracted factors. In the second step, the final research questionnaire was designed and distributed among 290 Iranian mobile phone users. Examining the results of completing the questionnaires and analyzing descriptive statistics data was done in the third step. Finally, using the structural equation method and SmartPLS 3 software, the factors' effect and the research model's validity were investigated. The first study of the effect of CPBI on CBBE with a wide scope is done in this research. Also, presenting the research model and checking the validation of the model adds to the value of the research.

*Keywords:* Perceived innovativeness, Customer-Based brand equity, Brand awareness, Brand associations, perceived quality, Brand loyalty

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## Introduction

The developments of the global society and the advancement of various technologies (Bel and Joseph 2018; Bilgili et al 2015; Sheoran 2012) are one of the main reasons for the occurrence of fundamental changes in the field of various businesses. The trend of consumer lifestyle changes (Boer et al 2021; Furihata et al, 2018) and the diversity of their tastes in choosing products have been among the things to consider in recent decades; This diversity of consumers' taste has created a more intense competitive environment in many businesses than in the past. Therefore, companies are present in the form of different brands in this competitive environment, and this trend is always increasing.

The trade name and logo (brand) are the intangible assets of companies that can play a significant role in their growth and profitability in the long term (Şahin et al 2011). Brands play important roles; They differentiate products and services and communicate with consumers (Faber and O'Guinn 2018; Oh et al 2020). A worthy brand gives satisfaction and confidence to the company's customers and employees and can increase market awareness of new products; It can also accelerate the entry of products into the markets and ultimately lead to an increase in market share(Ha et al 2011; Keller and Swaminathan 2019)

Brand equity was also first defined by Aaker as follows: "The set of five groups of assets and obligations of the brand that is connected to the name or symbol of the brand. This collection adds or reduces the value of a product or service for a company or its consumers." (Faber and O'Guinn 2018; Oh et al 2020). To be active in different markets, companies must pay attention to brand equity, especially Customer-Based brand equity (C.B.B.E.) in their related fields.

Today's powerful activity in the competitive business environment requires proper knowledge of C.B.B.E. and the factors affecting it (Keller and Swaminathan 2019; Tiwari 2010). Accurately knowing the factors affecting C.B.B.E. and improving them helps companies take necessary measures to meet their needs by accurately identifying customers' needs.

In addition to financial advantages and increasing sales of companies, paying attention to C.B.B.E. and improving it will also highlight the brand position of companies in customers' minds. On the opposite point, companies' lack of attention to C.B.B.E. will face fundamental problems in realizing their goals at different levels; Senior managers will also see the diminution of their company's activity in competitive markets. Therefore, various companies and organizations are considering increasing awareness of C.B.B.E.; For this reason, they are trying to get familiar with the tools and methods for improving C.B.B.E. and its constituent factors.

Aaker is one of the researchers who has carried out effective activities in this field. Brand equity in Aaker's model consists of five dimensions: Brand awareness, perceived quality of the brand, mental association of the brand, loyalty to the brand, and other proprietary assets of the brand, such as privileges and trademark registration rights(Chen and Tsai 2007). In the following years, other models based on Aaker's model were presented to measure Customer-Based brand equity (C.B.B.E.). One of these models was the model developed by Fayrene and Lee (Fayrene and Lee 2011).

Researchers point out in their research that brand equity can be created, protected, and even developed by strengthening its dimensions. For example, every marketing activity has the potential to affect brand equity; Because

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these activities show the effect of marketing investments made on the brand.

In the conducted research, the impact of various factors such as brand communication (Arya et al 2022; Chandrakamal and Pandithasekara, 2022), brand gender (Machado, Vacas-de-Carvalho, Azar, André, and dos Santos, 2019), brand experiences (Hoiriyah et al, 2022; Pina and Dias, 2020), celebrity endorsement credibility (Dwivedi et al, 2015) and family (Gil et al, 2007) on C.B.B.E. has been investigated to improve the quality of brand equity. Examining the results of this type of research has helped a lot in knowing the beneficiaries of C.B.B.E.

In addition to all methods and factors affecting C.B.B.E., attention to innovativeness will be another effective factor in increasing and improving C.B.B.E. Innovativeness is defined as the organization's ability to implement innovation (Galunic and Rodan, 1998) repeatedly. Different dimensions of innovativeness can be seen in the existing literature. Such as innovativeness from the management perspective and innovativeness from the Customer's perspective. Also, innovativeness exists at different levels, such as organization, brand, and Customer. In this research, innovativeness is defined from the Customer's point of view and at the brand level. Shams and her colleagues define the Customer's perceived brand innovativeness (C.P.B.I.) as "the customer's perception of the brand's innovation in the brand's previous products, the degree of creativity and the brand's potential for innovative activities in the future of the market."(Shams et al, 2015).

Subjects such as brand innovation (Chou and Pai, 2017; Hariandja and Sartika, 2022; Liu, 2022; Nguyen et al, 2016), Customer perceived innovativeness of the brand (J. Kim et al, 2015; Y. Wang et al, 2013; S. I. Wu and Ho, 2014), have been investigated through numerous types of research. Also, some research activities have investigated the relationship of brand innovativeness with one or more dimensions of Aaker. In addition, in another group of research, very limited articles have been published on the relationship between C.P.B.I. and its impact on some dimensions of C.B.B.E. (French and Smith, 2013; Krishnan, 1996; Pappu et al, 2005; Pappu and Quester, 2016). For example, Pappu's research has investigated the relationship between C.P.B.I. and customer loyalty, considering the mediating role of perceived quality (Pappu and Quester, 2016). Another research investigated the relationship between perceived innovativeness, brand quality, and mental association (Baalbaki and Guzmán, 2016).

According to the reviews, the lack of comprehensive research to examine the relationship between C.P.B.I. and the entire conceptual structure of C.B.B.E. is felt. Also, in Iran (as the geographical area of research), observing very limited research related to this issue indicates the need for more extensive investigations related to this field.

It is necessary to look specifically at the issues of innovativeness and examine its effects on brand equity by researchers in this field and business owners; The expression of these issues is in line with the dynamics of business. Therefore, through the localization of Fayrene and Lee's model, the relationship between C.P.B.I. and C.B.B.E. in the domestic mobile phone market is investigated for several brands; The effects of C.P.B.I. as an independent variable on C.B.B.E. and its multiple dimensions are investigated for the first time.

The research gap can be improved by examining the relationship between two

variables. A better understanding of C.P.B.I.'s role in creating greater brand success will also be gained. Finally, it can be understood whether the Customer's perception of a brand's innovativeness can bring tangible value to the brand or not.

The output of this research project can help increase the understanding of Iran's market activity and increase the market share of domestic-related industries. In addition, the purpose of this scientific research in the dimension of scientific goals is to help expand the literature on innovation and connect innovation with the concepts of brand and branding as much as possible. Although innovation management needs to be expanded in all its abstract and conceptual dimensions, the connection of innovation with industry and business is inevitable for improving and promoting innovation and business concepts.

Also, studying the research results by industrial companies (in which innovation plays a prominent role) will help to know more about the Customer and how they perceive the quality of the company's output product. On the other hand, it is predicted that the output of this research will be useful in the field of industrial policy, institutions that accelerate innovation or innovation policy, research institutions or study institutions in the field of branding or innovation, professors and students in the field of management, as well as domestic companies that deal with innovation (especially domestic manufacturers of phones and computer equipment) will be effective.

## 2. Research Literature
### 2.1 Innovation
Innovation is the first attempt to implement the idea of a product or a process (Kahn, 2018; Timur and Antanas, 2017). The important point in correctly understanding the concept of innovation is to pay attention to the difference between innovation and invention. An invention can be considered as the appearance of an idea in a person's mind, But innovation means implementing an idea (Fagerberg et al, 2005; Singh and Aggarwal, 2022). Throughout history, many examples of inventions never reached the market and did not become successful innovations.

At the macro level, researchers consider innovation necessary for countries' economic growth (Risso and Carrera, 2018; Broughel and Thierer, 2019). In this regard, the greater capacity of innovation in North America (the most important factor) has created a different economic situation compared to South America and Europe (during similar economic conditions) (Cirera and Maloney, 2017).

Innovation can be the savior of companies in the competition of companies and today's complex and dynamic environment. Even some researchers believe that innovation has a close relationship with the survival and growth of the company (Dereli, 2015; Dustin et al, 2014; Ortiz-Villajos and Sotoca, 2018). However, it should be noted that the success of innovation may not be achieved easily and requires more resources than is usually thought, As in practice, few companies reach their research goals. For this reason, researchers have recommended a process-oriented approach to innovation for successful innovation (Dereli, 2015; Tidd et al, 1997). The innovation process is a central process for a business; Because it can revive the organization, offer new products and services, and change the way of creating and supplying products and services (Ortiz-Villajos and Sotoca, 2018).

Various research efforts have investigated the impact of innovation on businesses in different dimensions; The multiplicity of these researches on the

impact of innovation in different sectors shows the importance of this issue. Different fields of innovation in business models (Bouncken et al, 2021), technology innovation (Chege et al, 2019; Galende, 2006; Q. Wang et al, 2019), brand innovation (Hariandja and Sartika, 2022; Liu, 2022), advertising innovation (El-Gohary and Raghubansie, 2021; Mendelová and Zaušková, 2015) are some of the research fields related to the impact of innovation in businesses. Through the review of various research on innovation and its effects on business, it is concluded that an organized look at innovation and its ability to learn and manage it in different fields will be possible as a process. Therefore, companies should learn and manage innovation to gain a competitive advantage (Dereli, 2015; Tidd et al., 1997; Timur and Antanas, 2017). Because companies with better innovation capacity can implement innovation more effectively, and their innovation performance will be richer.

### 2.1.1 Innovativeness Perceived by The Customer

Perception is how people organize and interpret their sensory perceptions to understand their surroundings. Nevertheless, people's understanding of reality is very different from objective facts. People's behavior is formed based on their perception of reality, not reality itself (McDonald, 2011; O.U., 2017); This is why perception is important for organizational behavior. On the other hand, innovativeness repeatedly refers to an organization's ability to implement innovation (Fu, 2022; Organ and Ryan, 1995; Ruvio et al, 2014). By reviewing the existing subject literature and according to Figure 1, innovativeness has been discussed from the Customer's perspective or management and at the levels of organizations and brands

(Damanpour, 2017; Shams et al., 2015). The present study examines innovativeness from the Customer's perspective and at the brand level. Shams and her colleagues define C.P.B.I. as the Customer's perception of a brand's history in product innovation, the degree of creativity, and the brand's potential to continue innovative activities in the future in a specific market (Shams et al., 2015).
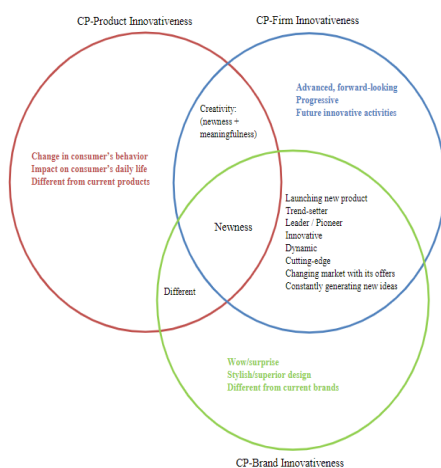
Brand innovativeness (J. Lin et al, 2017; Pappu and Quester, 2016), product innovativeness ( Calantone et al, 2006; Talke et al, 2009), and organizational innovativeness (Crossan and Apaydin, 2010; Damanpour, 2017) are similar concepts, but they are categorized at different levels of abstraction(Pappu and Quester, 2016). An organic achieve a high degree of organizational innovativeness by implementing innovation within itself, But this is not the case for all its brands. Organizational innovativeness can introduce an organization in the Customer's mind as an innovative organization by introducing innovative products and brands in terms of the target market (Crossan and Apaydin, 2010; Damanpour, 2017). The difference between brand innovativeness and product innovation is that a brand can offer different products with different degrees of innovation.

Organizational-level concepts such as innovation-oriented and innovation capability are required to have brand innovativeness. When an organization is oriented towards innovativeness, it is influenced by several characteristics of organizational culture. These characteristics mphasize collaborative decision-making, learning, power sharing, encouragement, and teamwork (Hurley and Hult, 1998; Jiménez and Cegarra-Navarro, 2007; Paladino, 2007). Innovativeness ability consists of the

necessary and sufficient expertise and skill to absorb, learn and advance current technologies. It should be noted that in creating the perception of brand innovativeness, the organization must be able to communicate the existence of this concept in its brand in an efficient way to its target customers( Menidjel et al, 2017; Pappu and Quester, 2016).

Since C.P.B.I. is a subjective judgment perceived by the Customer, it can arise from a completely new product or service, a new feature in the product, or an extension of the brand (J. Kim et al., 2015; Y. Wang et al., 2013; Wu and Ho, 2014). But Brown and Dacin believe that the essence and characteristics of a brand must remain constant over time to create a perception of innovativeness in the Customer (Brown and Dacin, 1997; Shams et al., 2015). Therefore, organizations should be able to direct their innovation activities toward products and services based on fixed principles; This issue can be done with the help of the models presented in the research.

**FIGURE 1    Customer perceived innovativeness associations (Shams et al., 2015)**



Although most recent researches refer to the model presented by Shams et al. (Nørskov et al, 2015; Pappu and Quester, 2016), before that, Eisingerich and

Rubera defined brand innovativeness as "the degree to which a customer believes that a brand can provide new and useful solutions for his new needs"(Eisingerich and Rubera, 2010) .Emphasis on responding to the needs of consumers is the difference between this definition and the definition presented by Shams and her colleagues. Meanwhile, Shams and her colleagues believe that people can consider a brand as an innovative brand even if they do not need the products of a brand (Shams et al., 2015). For example, Google is known as an innovative company, while people may not need projects like Google's self-driving car right now.

## 2.2 Customer-Based brand equity

Branding uses a name, symbol, design, or experience related to a product or service by presenting images and experiences related to products, services, and organizations (Neumeier, 2005; Schmitt, 1999; Swaminathan et al, 2020). Appropriate branding strategies can help the organization create long-term success and build sustainable competitive advantage ( Kumar et al, 2003; Liu, 2022). Therefore, a strong brand gives value to its organization, which can be seen in brand equity (Pina and Dias, 2020). Knowing how to build, measure and manage brand equity is essential and vital for an organization (Kapferer, 2012; Keller, 1993). Brand equity can be evaluated from two different perspectives: from the Customer's point of view or the economic-organizational point of view. This study will focus on Customer-Based brand equity (C.B.B.E.); Because the most key capital of any brand is its customers, and a large part of a brand's success depends on paying special attention to customers (Hoiriyah et al., 2022; Keller, 2001; Pina and Dias, 2020).

According to Lassar, Mittal, and Sharma, C.B.B.E. is the ability to attach perceived

values and customer press to the brand through offering products and services ( Lassar et al, 1995). A strong C.B.B.E. manifests itself as increased business power, reduced organizational threats, and increased profit margins ( Bendixen et al, 2004; De Chernatony and Cottam, 2006; Kim et al, 2003). Simon and Sullivan define economic or organizational brand equity as the incremental cash flow generated by branded products (in addition to the flow generated by unbranded products.) (Simon and Sullivan, 1993).

Although customer perception of brand innovativeness is an important factor in increasing brand success, there are few empirical studies about its relationship with all dimensions of C.B.B.E. (Brunello et al, 2014; Guceri-Ucar, 2014). Some researches indicate that the Customer's perception of brand innovativeness positively affects customers' attitude towards the brand (Gürhan-Canli and Batra, 2004; O'Cass and Ngo, 2011). Also, the positive relationship between customer perception of brand innovativeness and brand commitment is the result of related research (Eisingerich and Rubera, 2010). Falkenreck and Wagner also show that the Customer's perception of brand innovation positively affects the stability of the seller-buyer relationship (Falkenreck and Wagner, 2011). On the other hand, innovative brand experiences will positively affect C.B.B.E. and brand satisfaction, according to research (Y. H. Lin, 2015).

## 3. Theoretical framework

Customer perception of brand innovativeness and brand innovative experiences are similar concepts, While these concepts differ. Customer perception of brand innovativeness is a subjective evaluation based on customer perception. At the same time, brand-related stimuli evoke a brand experience, emotions, cognitions, and behavioral responses. These drivers are part of the brand's design, identity, communication, and surrounding environment (Pina and Dias, 2020; Şahin et al., 2011). Innovative brand experiences occur when the Customer perceives these stimuli as innovative. Ambler, Bhattacharya, Edell, Keller, Lemon, and Mittal, argue that brand experience occurs when customers use the brand, share their opinions with others about it, and collect information about it (Ambler et al., 2002). Therefore, another difference can be seen between the Customer's perception of brand innovativeness and innovative experiences. In the concept of innovative experiences, the Customer must face the brand himself, While in the Customer's perception of brand innovativeness, this is not required. Finally, by reviewing the research literature related to the topics of customer perception, C.B.B.E., and brand innovativeness, the first research hypothesis is presented:

***Hypothesis 1: Customer perception of brand innovativeness has a positive effect on C.B.B.E.***

A detailed investigation of the relationship between customer perception of brand innovativeness and C.B.B.E. is required. For this purpose, examining various C.B.B.E. measurement methods will help to identify different factors in the C.B.B.E. subset. Finally, the examination of measurement models will complete the assumptions and increase the accuracy of the conceptual model.

By examining C.B.B.E. measurement methods, different formats for C.B.B.E. measurement are observed (Baalbaki and Guzmán, 2016; Christodoulides and de Chernatony, 2010; French and Smith, 2013; Pappu et al, 2005). According to De Chernatony and Cottam's research, instead of a comprehensive model for evaluating brand success, a range of

economic and non-economic measurements provide the necessary insight (De Chernatony and Cottam, 2006).

Generally, there are two methods to measure eigenvalue. Direct and indirect method (Agarwal and Rao, 1996): The direct method tries to calculate the brand's added value and thereby defines the special value (Keller, 1993). While the indirect approach seeks to identify potential sources of equity; Because having a proper understanding of these resources for the company's brand and its competitors' brands is vital for brand management (Keller, 1993). Aaker and Keller provide a wide range of measures and indirect methods for estimating C.B.B.E. (Agarwal and Rao, 1996; Buil et al, 2008; Christodoulides and de Chernatony, 2010).

For example, Aaker suggests that measures of repurchase rate, switching costs, satisfaction, brand preference, and perceived quality be used to evaluate equity over a range of products and services (Aaker, 1991). Also, Keller suggests that subjective preference recall, free associations, ratings of evaluations, and association beliefs are used as measures of brand knowledge (Keller, 1993; Keller and Swaminathan, 2019). According to researchers, developing insight into measuring C.B.B.E. will be important to achieve a competitive advantage in marketing activities (Christodoulides et al, 2015; Pappu et al., 2005). On the other hand, measuring brand equity is also very important. According to Keller's C.B.B.E. model, it is influenced by buyers' knowledge about a brand and consumers' favorable and unique connections with the brand(Keller, 1993; Keller and Swaminathan, 2019).

Keller defines C.B.B.E. as "the differential effect of brand knowledge on customer response to brand marketing activities." Also, he considers brand knowledge to consist of two components: brand awareness, which in his opinion, is the degree of availability of the brand in the memory and refers to the recall and recognition of the brand by the product. The second component is the mental image of the brand, which is a series of associations that the consumer creates in his mind with the brand(Keller, 1993). Keller's model is introduced in four steps and builds a brand ladder. The start of each step depends on the success of the previous step. These four steps include six blocks and several subsets. In each of these four steps, questions related to that section are answered (Keller, 2001).

Fayrene and Lee have conducted other studies, and the result is the presentation of a model according to Figure 4 and based on the development of Aaker's model. This research will measure C.B.B.E. through four components of brand awareness, brand association, perceived quality, and brand loyalty(Fayrene and Lee, 2011)

**FIGURE 2** *Fayrene and Lee's C.B.B.E. model for measurement framework (Fayrene and Lee, 2011)*

**FIGURE 2**
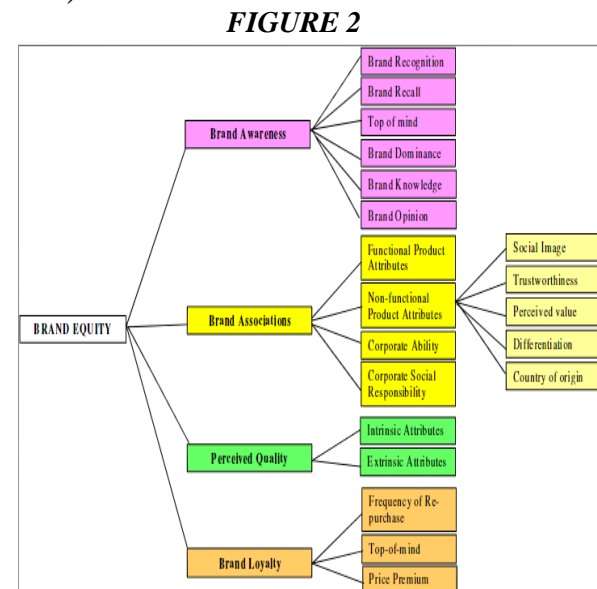
In most C.B.B.E. models, brand awareness is identified as a key determinant (Faber and O'Guinn, 2018; Oh et al., 2020; Swaminathan et al., 2020). Keller considers awareness as the ability of customers to recognize and remember the brand, which originates from the ability of customers to identify the brand in different situations (Keller, 2003; Oh et al., 2020).

Also, the ability of customers to connect the name, logo, and symbol of a brand and a specific company in their mind is another part of this concept, according to Keller (Keller, 2003). Aaker identifies higher levels of awareness alongside recall and recognition and adds subjective preference, brand dominance, brand knowledge, and brand opinions to the former (Aaker, 1996; Faber and O'Guinn, 2018).

According to Aaker's research, for new or niche brands, recognition can be important, but for well-known brands, recall and subjective preference are more important and meaningful; Also, brand knowledge and brand opinions can be partially used to measure brand recall (Aaker, 1996; Oh et al., 2020). Aaker believes that brand awareness is the most important component of brand attachment; Because the Customer needs to be aware of the brand to associate the meanings of the brand (Aaker, 1996; Oh et al., 2020). In this regard, the second

*hypothesis is presented:*
***Hypothesis 2: Customer perception of brand innovativeness positively affects brand awareness.***
Brand association is the most accepted component of C.B.B.E. (Aaker, 1992; Buil et al., 2008; Christodoulides et al., 2015). Associations provide the basis for purchase decisions and brand loyalty(Aaker, 1991; Christodoulides et al., 2015). Brand associations include all thoughts, feelings, perceptions, images,

experiences, beliefs, and attitudes toward the brand. In other words, it includes everything associated with a brand mind ( Kotler et al, 2014).
Researchers have found different associations related to brand equity (Biel, 1992; Brown and Dacin, 1997; Farquhar and Herr, 1993; Oh et al., 2020). For example, Chen classifies two types of brand associations into product associations and organizational associations (Cheng-Hsui Chen, 2001). Based on the results of the review of the sources referring to the brand association, the third hypothesis of the research is presented:

***Hypothesis 3: Customer perception of brand innovation positively affects brand associations.***
Perceived quality is seen more as a separate dimension of C.B.B.E. than part of overall brand associations (Fayrene and Lee, 2011). The definition that researchers mainly express about perceived quality is the judgment of customers regarding a brand's advantage, superiority, credibility, and success compared to other competing brands (Kenyon and Sen, 2015).

Perceived quality affects other brand dimensions and the products' classification from the Customer's point of view (Aaker and Joachimsthaler, 2001; Weis and Huber, 2019). Perceived quality is the Customer's judgment about the advantage and superiority of the product, which is different from the concept of objective quality (Christodoulides et al., 2015; Pappu and Quester, 2016). Objective quality refers to the service or procedure and technical, measurable, and verifiable characteristics of the product; Objective quality does not necessarily participate in C.B.B.E. Since consumers can't make a complete and correct judgment about objective quality, they use the characteristics that they

consider about quality. Therefore, perceived quality is created to judge the product's or service's overall quality (Kenyon and Sen, 2015; Pappu and Quester, 2016; S. I. Wu and Ho, 2014). Researchers state that quality is directly affected by perception; They point out that consumers use quality attributes to infer the quality of an unfamiliar product. Therefore, it is important to note that the relevant quality attributes are related to C.B.B.E. (Fayrene and Lee, 2011; Kenyon and Sen, 2015).

The concept of perceived quality has been classified by some research into two groups with internal and external characteristic factors (Morar and Dumitrela, 2013; Solomon and Bamossy, 2016). Intrinsic characteristics relate to the physical aspects of the brand (such as color, taste, smell, form, and appearance). On the other hand, external characteristics refer to the non-physical components of the product (such as brand name, seal, quality, price, store, packaging, and product information)(Bernués et al, 2003). Since the characteristics of each product group are different, it is difficult to generalize the characteristics of one group to other product groups (Fayrene and Lee, 2011). Finally, by reviewing the research literature in the field of perceived quality and referring to the above explanations, the fourth hypothesis of the research is proposed:

*Hypothesis 4: Customer perception of brand innovation positively affects perceived quality.*

Loyalty is a central dimension of C.B.B.E. Aaker considers brand loyalty as an attachment that a customer attaches to a brand (Kadasah, 2022; J. Lin et al., 2017). Some researchers describe different levels of brand loyalty (Gremler and Brown, 1996; Rai and Srivastava, 2012). Behavioral loyalty is related to consumer behavior in the market,

determined by the number of repeated purchases or the commitment to repurchase the brand as the priority (Keller and Swaminathan, 2019). Cognitive loyalty is another level of loyalty that is created when a purchase decision is needed; Because the brand is the first thing that comes to the buyer's mind (Härtel and Russell-Bennett, 2010). Cognitive loyalty is very close to the highest level of brand awareness (subjective preference); This level indicates that a brand in a specific product group is the consumer's favorite and is the first reminder that comes to the consumer's mind. Therefore, a brand should be able to be recalled as the first choice (cognitive loyalty) and then purchased repeatedly (behavioral loyalty) (Keller and Swaminathan, 2019).

Chaudhuri and Holbrook state that brand loyalty is directly related to brand price (Chaudhuri and Holbrook, 2001). In another study, Aaker mentions that price premium is a basic indicator of loyalty. The price premium is the amount a customer pays for a brand compared to a brand offering the same benefits (Aaker, 1996; Netemeyer et al., 2004; Şahin et al., 2011). This value can be different depending on the two compared brands. By studying different sources in the field of brand loyalty and gaining a proper insight into the concept of loyalty, the final hypothesis of the research can be proposed:

*Hypothesis 5: Customer perception of brand innovativeness positively affects brand loyalty.*

The development of two key research concepts was done during the review of the research literature and the presentationof the theoretical framework. These concepts included"customer-perceived rand innovativeness" as the independent variable of the research and "Customer-Based brand equity" There are different theories for both

concepts; The review and summary of the indicators and factors proposed for these two concepts can be seen in Tables 1 and 2.

**TABLE 1 Presented components for the concept of C.P.B.I.**

| | Components | References |
|---|---|---|
| 1 | ...ness | (Danneels and Kleinschmidtb, 2001; Eisingerich and Rubera, 2010; Shams et al., 2015; Talke et al., 2009) |
| 2 | ...g a trendsetter | (Shams et al., 2015) |
| 3 | ...ership and being a pioneer | (Crossan and Apaydin, 2010) |
| 4 | ...g innovative | (Shams et al., 2015) |
| 5 | ...mism | (Dereli, 2015; Hariandja and Sartika, 2022; Shams et al., 2015) |
| 6 | ...ng Edge | (Kadasah, 2022; Shams et al., 2015) |
| 7 | ...ging market conditions with products | (Dereli, 2015; Shams et al., 2015) |
| 8 | ...ding new ideas continuously | (Berger et al., 2014; Shams et al., 2015) |
| 9 | ...rentiation | (Andersén, 2021) |
| 10 | ...! / Surprise | (Shams et al., 2015) |
| 11 | ...sh and unique design | (Shams et al., 2015; Talke et al., 2009) |
| 12 | ...g different from current brands | (Nørskov et al., 2015; Shams et al., 2015) |
| 13 | ...products | (Eisingerich and Rubera, 2010) |

### TABLE 2 Presented components for the concept of C.B.B.E

| | | Components | References |
|---|---|---|---|
| | ١ | Repurchase rate | (Aaker, 1991, 1996; Farjam et al., 2015; Fayrene and Lee, 2011; L. Y. Wu et al., 2014) |
| | ٢ | Switching Costs | (Biedenbach et al., 2015; Thompson et al., 2019) |
| | ٣ | Satisfaction Level | (Aaker, 1996; Pappu and Quester, 2016) |
| | ٤ | Brand Preferences | (Aaker, 1996; Baalbaki and Guzmán, 2016; Cobb-Walgren et al., 1995; Farjam et al., 2015) |
| | ٥ | Perceived Quality | (Aaker, 1991, 1996; Buil et al., 2008; Christodoulides et al., 2015; Gil et al., 2007; Ha et al., 2011; H. B. Kim et al., 2003; H. B. Kim and Kim, 2005; R. B. Kim and Chao, 2018; Netemeyer et al., 2004) |
| | ٦ | Top of Mind | (Farjam et al., 2015; Fayrene and Lee, 2011; Keller, 1993) |
| | ٧ | Brand awareness | (Aaker, 1996; Biedenbach et al., 2015; Buil et al., 2008; Christodoulides et al., 2015; Buzdar, Janjua, and Khurshid, 2016; Fayrene and Lee, 2011; Gil et al., 2007; Keller, 1993; H. B. Kim et al., 2003; H. B. Kim and Kim, 2005; R. B. Kim and Chao, 2018; Pappu et al., 2005) |
| | ٨ | Performance (Relative to requirement) | (Aghaei et al., 2013; Keller, 1993) |
| | ٩ | Mental imagery (Perceptual performance) | (Aghaei et al., 2013; Keller, 1993) |
| | ١٠ | Judgments (Overall Brand Performance) | (Aghaei et al., 2013; Keller, 1993) |
| | ١١ | Alignment with the brand | (Keller, 1993; Keller and Swaminathan, 2019) |
| | ١٢ | Price premium | (Aaker, 1996; Fayrene and Lee, 2011; Netemeyer et al., 2004; Şahin et al., 2011) |
| | ١٣ | Brand Recognition | (Aghaei et al., 2013; Farjam et al., 2015; Fayrene and Lee, 2011; Keller, 1993; Nofal et al., 2020) |
| | ١٤ | Brand Recall | (Aaker, 1991, 1996; Fayrene and Lee, 2011; Gil et al., 2007; R. B. Kim and Chao, 2018) |
| | ١٥ | Brand knowledge | (Farjam et al., 2015; Fayrene and Lee, 2011; Keller, 1993, 2003; Md Jamshed and Prashad Pathak, 2019; ur Rehman and Kausar, 2016) |
| | ١٦ | Functional Product Attributes | (Christodoulides and de Chernatony, 2010; Fayrene and Lee, 2011) |
| | ١٧ | Nonfunctional Product Attributes | (Christodoulides and de Chernatony, 2010; Fayrene and Lee, 2011) |
| | ١٨ | Social Image | (Buzdar et al., 2016; Fayrene and Lee, 2011) |
| | ١٩ | Trustworthiness | (Buzdar et al., 2016; Fayrene and Lee, 2011; Li et al., 2017) |
| | ٢٠ | Perceived value | (Fayrene and Lee, 2011; Hoiriyah et al., 2022; Netemeyer et al., 2004) |
| | ٢١ | Differentiation | (Fayrene and Lee, 2011; Pina and Dias, 2020) |
| | ٢٢ | Country of origin | (Fayrene and Lee, 2011; R. B. Kim and Chao, 2018) |
| | ٢٣ | Corporate Social Responsibility | (Berens et al., 2007; Grayson and Hodges, 2017; Shamma, 2022) |
| | 24 | Corporate Ability | (Berens et al., 2007; Brammer et al., 2014) |
| | ٢5 | Intrinsic Attributes | (Md Jamshed and Prashad Pathak, 2019; ur Rehman and Kausar, 2016) |
| | ٢٦ | Extrinsic Attributes | (Md Jamshed and Prashad Pathak, 2019; ur Rehman and Kausar, 2016) |

As a result of the studies, five hypotheses related to the research topic were presented and mentioned throughout the chapter. As a good conclusion of the theoretical framework, a conceptual model related to the research topic (Figure 3) is presented by reviewing and studying the research literature and applying the research hypotheses. Figure 3 displays the five factors (C.P.B.I., brand awareness, brand association, perceived quality, and customer loyalty) along with their constituent parameters.

***Insert Figure 3 about here***
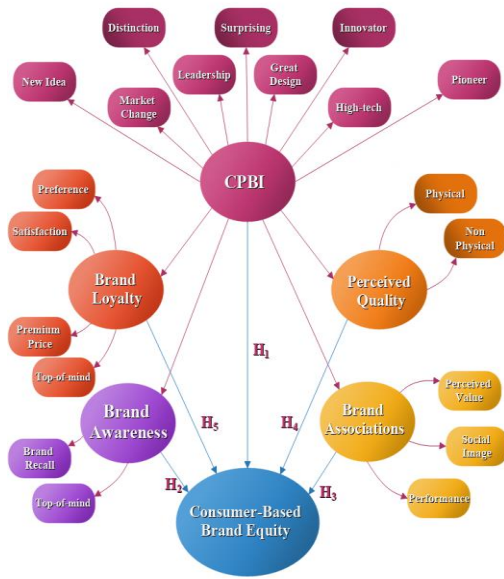


## 4. Methodology

In the review of research literature, domestic and international research related to the fields of "Customer Perceived Innovativeness (C.P.B.I.)" as an independent research variable and "Customer-Based brand equity (C.P.B.E.)" were examined. Also, the theoretical framework of the research, based on the conducted studies, was dedicated to introducing and providing the necessary explanations about the five research hypotheses. Finally, the influencing factors on the formation of C.P.B.I. and C.B.B.E. concepts were fully mentioned in Tables 1 and 2. Also, the conceptual model of the research was presented in Figure 3 by summarizing the studies, and C.B.B.E. models, extracting influential factors (Tables 1 and 2), and applying the research hypotheses.

After presenting the research model, the extracted influencing factors were given to 28 people randomly through an initial questionnaire. The participants were asked to determine the appropriateness and ambiguity of each questionnaire item in the C.B.B.E. and C.P.B.I. sections on a 5-point Likert scale. This action resulted in benefiting from the participants' opinions and conducting the Face validity of the research.

After checking the obtained answers, the average of the answers was calculated for each question, and two indices with averages below three were removed; Also, after doing this step and getting the necessary feedback, it was decided to remove the question related to "the company's ability to produce quality products," because this item is mentioned more extensively in the quality questions of the internal and external characteristics of brand products. In Table 3, you can see the questions removed at this stage.

*Insert Table 3 about here*
### TABLE 3 Factors removed in the face validity assessment stage

| * | Factors | References |
|---|---------|-----------|
| 1 | Switching Costs | (Biedenbach et al., 2015; Thompson et al., 2019) |
| 2 | Corporate Social Responsibility | (Berens et al., 2007; Grayson and Hodges, 2017; Shamma, 2022) |
| 3 | Corporate Ability | (Berens et al., 2007; Brammer et al., 2014) |

By examining the results of the initial questionnaire and after removing the factors in Table 3, the factors affecting the research topic are ready to design the final questionnaire.

The objectives of the test were explained to the experts, and the operational definitions of the research questions were presented to them. As a result, the content validity ratio (CVR) index was determined by examining experts' opinions (using the focus group method). Finally, the content validity index was calculated for each question. It should be noted that at this stage, the views of five experts related to the subject were used, and the appropriate amount of CVR was examined.

In addition, the reliability of the research was evaluated using the composite reliability criterion (C.R.). The number of this index for each hidden variable is above 0.7, and the average variance extracted is more than 0.5; For this reason, the reliability of the hidden variables of this research is desirable (Bagozzi and Yi, 2011; Fornell and Larcker, 1981). Table 4 refers to the results of the composite reliability test.

*Insert Table 4 about here*

**TABLE 4 Composite reliability through C.R. and AVE**

| * | Average Variance Extracted(AVE) | Composite Reliability |
|---|---|---|
| Awareness | 0.721 | 0.838 |
| CBBE | 0.613 | 0.94 |
| Association | 0.684 | 0.866 |
| CPBI | 0.619 | 0.935 |
| Loyalty | 0.742 | 0.919 |
| Perceived quality | 0.832 | 0.909 |

Finally, the effect of C.P.B.I. factors, brand awareness, brand association, perceived quality, and customer loyalty on C.B.B.E. is investigated using structural equation modeling. Structural equation modeling is considered a quantitative method that helps researchers to organize research (from theoretical studies and their compilation to the analysis of experimental data) in a multivariate format.

Accordingly, the research model (Figure 3) is evaluated using the P.L.S. method and Smart P.L.S. software (version 3.2). Also, the coefficients of the influencing factors will be obtained after implementing the P.L.S. algorithm on the research model.

All smartphone owners in Iran are the statistical population of the research. One of the well-known rules for determining the minimum number of samples required for the P.L.S. method is provided by Barclay and his colleagues (Barclay et al, 1995). According to Figure 3, the C.P.B.I. variable is measured with nine components; Therefore, based on the mentioned research, the number of 90 people is required as the minimum statistical sample.

The questions related to the research about the influential factors were completed. In this regard, the research literature and experts' opinions have been used after performing the above steps and applying the necessary changes in the questions and variables. A questionnaire containing questions related to influential factors was designed to evaluate the hypotheses. The sampling tool is an online questionnaire; In terms of distribution, it is classified as simple random sampling. Questionnaires were given to 290 mobile phone users as a statistical sample. These people were

asked to determine the effectiveness of were evaluated in the form of a Likert scale. Table 5 shows information related.

each factor. For this purpose, factors to the members of the statistical sample

*TABLE 5 Demographic characteristics of statistical sample members*

| Items | N | % |
|---|---|---|
| **Gender** | | |
| Male | 146 | 50.34 |
| Female | 144 | 49.66 |
| **Education** | | |
| Elementary& Middle School | 4 | 1.37 |
| High School diploma | 15 | 5.17 |
| Associate degree | ١٢ | 4.14 |
| Bachelor's degree | ١٠٨ | 37.24 |
| Master's degree | ١٢۶ | 43.45 |
| Doctoral Degree | ٢۵ | 8.62 |
| **Age** | | |
| Below 18 | 5 | 1.72 |
| 18-25 | 66 | 22.76 |
| 26-35 | 165 | 56.90 |
| 36-45 | 47 | 16.21 |
| Above 46 | 7 | 2.41 |
| **The most used mobile phone brands** | | |
| Samsung | 137 | 47.24 |
| Apple | 67 | 23.10 |
| Huawei | 35 | 12.07 |
| Sony | 19 | 6.55 |
| LG | 18 | 6.21 |
| HTC | 1 | 4.83 |

## 5. Results

The members of the statistical sample completed the distributed questionnaires, and the descriptive statistics analysis process was performed based on Table 5. In the next step, the model related to the

subject was implemented in SmartPLS software; The results of implementing the P.L.S. algorithm on the model can be seen in Figure 4.

*FIGURE 4  The results of running the P.L.S. algorithm on the model*
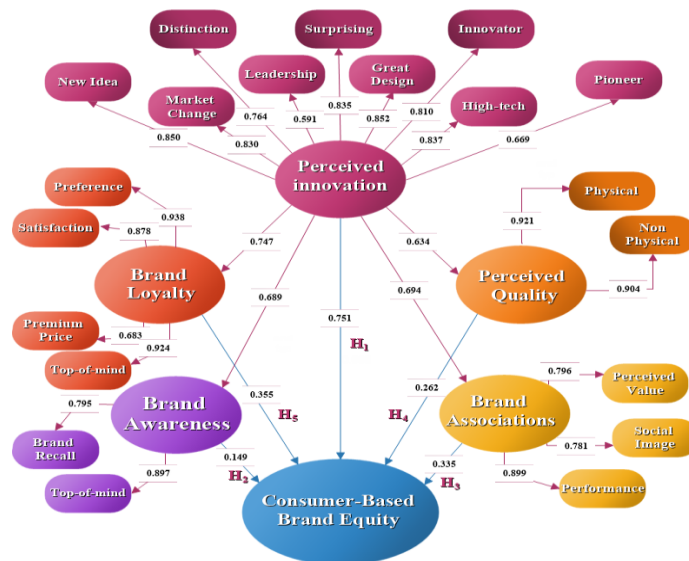
## 5.1 Quality analysis of the research model

It will be necessary to check the results of the P.L.S. to achieve a suitable and high-quality model and algorithm implementation on the model. For this purpose, a complete review of the obtained outputs is performed after the P.L.S. algorithm is implemented. Correct analysis of software outputs can be useful in checking the validity and generalizability of the model.

### 5.1.1 Path coefficients

Based on Figure 4, Table 6 shows the path coefficients between the two variables. It should be noted that the closer the path coefficient is to one, the higher the correlation between the path variables. Table 6 shows the highest correlation between C.P.B.I. and C.B.B.E. among the main hypotheses of the research. This result means that increasing C.P.B.I. will significantly increase C.B.B.E.

*insert Table 6 about here*

|  | Brand Awareness | C.B.B.E. | Brand Associations | C.P.B.I. | Brand Loyalty | Perceived Quality |
|---|---|---|---|---|---|---|
| Brand Awareness |  | 0.149 |  |  |  |  |
| Brand Associations |  | 0.335 |  |  |  |  |
| CPBI | 0.689 | 0.751 | 0.694 |  | 0.747 | 0.634 |
| Brand Loyalty |  | 0.355 |  |  |  |  |
| Perceived Quality |  | 0.262 |  |  |  |  |

### 5.1.2 External factor loads

The best analysis of the model can be realized by examining external factor loadings. Therefore, Table 7 displays the separated regression coefficients (direct effects between manifest variables under each hidden variable, with the desired hidden variable).

*TABLE 7 Table of External factor loads*

|  | Components | Brand Awareness | C.B.B.E. | Brand Associations | C.P.B.I. | Brand Loyalty | Perceived Quality |
|---|---|---|---|---|---|---|---|
| 1 | Recall | 0.795 |  |  |  |  |  |
| 2 | New Idea |  |  |  | 0.850 |  |  |
| 3 | Perceived value |  |  | 0.796 |  |  |  |
| 4 | Social Image |  |  | 0.781 |  |  |  |
| 5 | Performance |  |  | 0.899 |  |  |  |
| 6 | Market Change |  |  |  | 0.830 |  |  |
| 7 | Distinction |  |  |  | 0.764 |  |  |
| 8 | Leadership |  |  |  | 0.591 |  |  |
| 9 | Surprising |  |  |  | 0.835 |  |  |
| 10 | Great Design |  |  |  | 0.852 |  |  |
| 11 | Innovator |  |  |  | 0.810 |  |  |
| 12 | High-Tech |  |  |  | 0.837 |  |  |
| 13 | Preference |  |  |  |  | 0.938 |  |
| 14 | Satisfaction |  |  |  |  | 0.878 |  |
| 15 | Premium |  |  |  |  | 0.683 |  |
| 16 | Top of Mind (> Awareness) | 0.897 |  |  |  |  |  |
| 17 | Top of Mind (> Loyalty) |  |  |  |  | 0.924 |  |
| 18 | Non-Physical |  |  |  |  |  | 0.904 |
| 19 | Physical |  |  |  |  |  | 0.921 |
| 20 | Pioneer |  |  |  | 0.669 |  |  |

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If the values of the factor loadings between the questions of the questionnaire and the hidden variables are greater than 0.7, it is concluded that the question related to that structure has measured the hidden variable well (Al-Gasawneh and Al-Adamat, 2020; Nofal et al, 2020; Yang, 2013); Otherwise, the variable can be removed from the model. Accordingly, the questions related to leadership and being a leader can be removed from the total of C.P.B.I. questions (according to Table 7); Also, in the brand loyalty section, the question related to Price Premium has these conditions. It should be noted that according to some sources, if the composite reliability and average variance extracted are higher than 0.7 and 0.5, respectively, the acceptable external factor loading is 0.4 (Igbaria et al, 2015).

### 5.1.3 Determination factor or R square

Paying attention to the determination or detection coefficients (correlation square) is another important factor in measuring the model's quality. This coefficient for each hidden variable shows how many percent of the variable's variances can be described.

The determination coefficient is known as the most famous measure of goodness of fit for the model. According to the definition of the correlation coefficient, this coefficient is between -1 and 1; Therefore, $R^2$ as the square of the correlation coefficient will be between 0 and 1.

A high correlation indicates a good fit of the model to the data. At the same time, the low correlation (close to zero) indicates that the model does not provide a good fit for the data. It can be seen in Table 8 that the determination coefficients are at an acceptable level.

***TABLE 8 Table of determination coefficients***

|  | R Square |
|---|---|
| Brand Awareness | 0.472 |
| CBBE | 0.564 |
| Brand Associations | 0.481 |
| Brand Loyalty | 0.560 |
| Perceived Quality | 0.4۰3 |

***TABLE 9 Table of determination coefficients***

|  | P Values | T Statistics (|O/STDEV|) | Standard Deviation (S.T.D.E.V.) |
|---|---|---|---|
| Brand Awareness => C.B.B.E. | 0.01۲ | 13.9۱۷ | 0 |
| Brand Associations => C.B.B.E. | 0.01۱ | 36.73۱ | 0 |
| CPBI => Brand Awareness | 0.04۳ | 18.6۷۷ | 0 |
| CPBI => CBBE | 0.03۱ | 29.9۰۸ | 0 |
| CPBI => Brand Associations | 0.04۲ | 19.57۲ | 0 |
| CPBI => Brand Loyalty | 0.03۵ | 22.13۰ | 0 |
| CPBI => Perceived Quality | 0.04۲ | 16.14۳ | 0 |
| Brand Loyalty => C.B.B.E. | 0.01۴ | 25.7۵۹ | 0 |
| Perceived Quality => C.B.B.E. | 0.01۱ | ۲۲,۰۰۳ | 0 |

### 5.1.4 Model generalization capability

The T value and P value are considered to check the model's generalizability. Since the confidence level is 95%, If the T values are between -1.96 and +1.96, the relationship between the two hidden variables will not be accepted; otherwise, the relationship is acceptable. Also, this acceptance can be checked based on P-value; If the P-value is above 0.05, the relationship will not be accepted. Based on this, the T and P values in Table 9 are completed within the acceptable range.

At this stage, the set of different outputs was analyzed in SmartPLS software after implementing the research model. As a result of this part, it is inferred that the model has high and desirable qualifications based on the observations and review of all the tables related to the quality of the model.

## 5.2 Examining the research findings

After examining the descriptive and relational statistics, the proof or disproof of the main hypotheses of the research is evaluated. The use of structural equation modeling by the method of partial least squares and SmartPLS software (due to the advantages of this software) has received much attention from researchers, professors, and students. As mentioned, the value of T statistic and path coefficients (factor loadings) are provided to the user as two important outputs of using this software.

It was mentioned earlier that according to some sources, if the external factor load between the questions of the questionnaire and the hidden variable is more than 0.4, we conclude that the question we have used for that construct has measured the hidden variable well.

Also, if the value of the path coefficient between the independent variable and the dependent variable is positive, with the increase of the independent variable, we will see an increase in the dependent variable. On the other hand, if the value of the path coefficient between the independent variable and the dependent variable is negative, the increase in the independent variable leads to a decrease in the dependent variable.

Also, the value of the T statistic will be the main criterion for confirming or rejecting the hypotheses. If this statistic value exceeds 1.64, 1.96, and 2.58, we conclude that the corresponding hypothesis is confirmed at 90, 95, and 99 percent levels. Path coefficients and T statistic values are listed in Tables 6 and 9; According to the explanations provided and based on these two outputs, the proof or disproof of the main hypotheses of the research is checked.

***Hypothesis 1 Perceived innovativeness of the brand has a positive effect on C.B.B.E.***
The path coefficient between C.P.B.I. and C.B.B.E., which can be seen in Figure 4 and Table 6, is equal to 0.751 and shows a positive and significant correlation. This correlation means that increasing C.P.B.I. will significantly increase C.B.B.E. On the other hand, the T statistic extracted from Table 9 for this research is equal to 29.908, which is greater than 1.96; therefore, the above hypothesis is confirmed.

***Hypothesis 2 Perceived innovativeness of the brand has a positive effect on brand awareness.***
According to Figure 4 and Table 6, the path coefficient between C.P.B.I. and brand awareness is equal to 0.689; This number shows a positive and significant correlation between C.P.B.I. and brand awareness. It also points out that increasing C.P.B.I. significantly increases brand awareness. According to Table 9, the value of the related T statistic is also equal to 18.677, which is greater than 1.96 and therefore confirms the above hypothesis.

***Hypothesis 3 Perceived innovativeness of the brand has a positive effect on brand association.***
The path coefficient between C.P.B.I. and brand association (according to Figure 4 and Table 6) equals 0.694 and shows a positive and significant correlation. Also, this value indicates that the increase of C.P.B.I. significantly leads to increased brand association. The value of the T statistic displayed in Table 9 is also equal to 19.572 for this research, confirming the above hypothesis.

*Hypothesis 4 Perceived innovativeness of the brand has a positive effect on the perceived quality of the brand.*

Figure 4 and Table 6 show the coefficient of the path between C.P.B.I. and the perceived quality of the equal brand as 0.634. This number expresses a positive and significant correlation between C.P.B.I. and the brand's perceived quality. This value also indicates that increasing C.P.B.I. has a significant role in increasing the brand's perceived quality. On the other hand, the value of the relevant T statistic shown in Table 9 is equal to 16.143, and therefore the above hypothesis is confirmed.

*Hypothesis 5 Customer's perceived innovativeness of the brand has a positive effect on brand loyalty.*

Based on Figure 4 and Table 6, the path coefficient between C.P.B.I. and brand loyalty is 0.747, among the highest path coefficients in the entire model. This value indicates a positive and significant correlation between C.P.B.I. and brand loyalty, and it means that an increase in C.P.B.I. significantly leads to an increase in brand awareness. On the other hand, according to Table 9, the value of the T statistic extracted for this hypothesis is equal to 22.130, which is greater than the number 1.96; therefore, the above hypothesis is confirmed.

## 6. Discussions and review

This research will help to understand the effect of C.P.B.I. on C.B.B.E. As mentioned earlier, topics such as brand innovation (Chou and Pai, 2017; Hariandja and Sartika, 2022; Liu, 2022), Customer perceived innovativeness of the brand (J. Kim et al., 2015; S. I. Wu and Ho, 2014) and Customer-Based brand equity (Chandrakamal and Pandithasekara, 2022; Hoiriyah et al., 2022) had been investigated by various types of research. Also, research activities on a more limited scale have

been published on the relationship of C.P.B.I. and its impact on some dimensions of C.B.B.E. (French and Smith, 2013; Pappu et al., 2005; Pappu and Quester, 2016). But despite all this extensive research, the lack of comprehensive research to examine the relationship between C.P.B.I. and the entire conceptual structure of C.B.B.E. in the research space of this field has been quite noticeable. On the other hand, the leadings of the research topic, the extent of the factors extracted from how to influence, and the presentation of the appropriate research model are other aspects of distinguishing this research from past studies.

At the beginning of the research, it was devoted to the literature review in the field of C.P.B.I. Also, the contents related to C.B.B.E. were reviewed and collected among valid scientific references and articles, valid frameworks, and theories. At this stage, the topics were examined from the viewpoints of different researchers to get a complete view of the subject. The output of the first steps was the extraction of C.P.B.I. measurement indices (table 1) and C.B.B.E. measurement indices (according to table 2). In addition, five hypotheses were proposed, including the positive effect of C.P.B.I. on C.B.B.E., brand awareness, brand association, perceived brand quality, and brand loyalty. Finally, as a good conclusion of the theoretical framework, the conceptual model of the research was presented based on the extracted hypotheses and factors.

The next step was to choose the appropriate research method based on the opinion of professors in this field. Then it was time to prepare the research questionnaire; In this regard, to confirm the face validity, a preliminary questionnaire was distributed randomly to solve the possible ambiguities in the

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original questionnaire while checking the theoretical adequacy. Finally, the main questionnaire was prepared and distributed by examining the opinions of the professors (using the focus group method) and using the output of the previous steps.

By collecting 290 completed questionnaires, the analysis work on the obtained data began. First, using descriptive statistics, the respondents' age, gender, and education were described and analyzed in Table 5. By examining and performing the test, the obtained data were found to be normal, and SmartPLS 3 software was selected as the appropriate tool to continue the research process. Then, using the proposed assumptions, the research model was implemented in the software; The accuracy, validity of the research structure, and generalizability of the model were checked with inferential statistics tools and tests of the software. The output of this stage showed the confirmation of the conceptual model of the research, its results, and its assumptions at an acceptable level.

The results related to the research hypotheses indicate that the factor load of the model in the first hypothesis (the positive effect of C.P.B.I. on C.B.B.E.) is equal to 0.751, which shows a positive and significant correlation; This means that an increase in C.P.B.I. significantly leads to an increase in C.B.B.E. On the other hand, the value of the T statistic also confirms the validity of the first hypothesis. It seems that this effect is caused by the positive effect of the perception of innovativeness in the human mind on the components of C.B.B.E.

By examining the factor loadings between C.P.B.I. and C.B.B.E. components, among the C.B.B.E. components, C.P.B.I. has the greatest impact on customers' brand loyalty. This

observation shows that customers' perception of a product's innovativeness will determine their loyalty to the related brand. After loyalty, the greatest impact of C.P.B.I. is on brand association and increasing awareness among customers; Therefore, in addition to the fact that people search for and follow a brand more because of its innovativeness, the innovativeness factor has a positive effect on their feelings and perceptions towards the brand. Finally, C.P.B.I. has the least effect on the Customer's perceived quality of the brand; This case seems obvious because part of the perception of quality is related to the perception of the quality of a brand's physical and tangible components products. Therefore, this perception among people is usually done by using that brand and touching it.

## 6.1 Applications of research

As mentioned, companies' brand is considered one of its most important intangible assets. Creating and maintaining a desirable brand in customers' minds can play a significant role in the growth and profitability of companies in the long term; Because brands differentiate products and services. Also, the representative brand of the company communicates with the consumer at first glance.

The importance of creating and maintaining a suitable brand forces companies to take a closer look at C.B.B.E. and the innovativeness of their work area for a powerful presence in different markets. Companies with a proper understanding of C.B.B.E. (one of the types of brand equity) and the factors affecting it will find the potential for active presence in today's competitive business environment. Therefore, using the results of this research can be beneficial for the survival and growth of companies (especially local companies

and mobile phone manufacturing companies).

Another achievement of this research will be for universities and scientific institutions as well as professors and students active in innovation-related studies. Necessary research activities have been carried out to create a clear picture of innovation's value and value creation for this group of people. Although there have been various research efforts in the field of C.B.B.E. and its influencing factors; However, the lack of comprehensive research in the field of investigating the effect of C.P.B.I. on C.B.B.E. is felt. Therefore, this research can help researchers in this field as leading researchers.

On a broader level, the output of this research can be useful in the field of industrial policies and institutions that accelerate or make innovation policies. The attention of these institutions to the research in the field of innovation increases the accuracy and intelligent look for the approval of laws in the field of innovation in all industries of the country. It also facilitates the achievement of innovation at all levels.

## 6.2 Research limitations

The statistical sample of this research is mainly composed of mobile phone users in Tehran. Also, the statistical population is all potential and actual users of mobile phones throughout the country. The geographical dispersion of the statistical sample allows the researcher to examine the general behavior of the statistical population with higher precision. Therefore, in future research, considering the geographical dispersion of the statistical sample can effectively increase the accuracy of generalizing the results to the entire statistical population.

Another point is to use various methods of questionnaire distribution. The research questionnaires were provided to the sample members entirely virtually; However, the simultaneous use of different questionnaire distribution methods (including the traditional method) will be effective in realizing the age and educational distribution of the sample members; It also creates more confidence for the researcher to generalize the results to the whole society.

In addition to geographic dispersion and adopting different questionnaire distribution methods, using more members in the statistical sample will make the research results more accurate for the entire society. For this reason, it is hoped that future research will be conducted with a larger number of sample members to improve the quality of the results further.

## 6.3 Suggestions for future research

Most of the design and implementation of this research were done in the autumn and winter of 201٩. In this period, various factors caused the domestic market of digital products (especially mobile phones) to face high price fluctuations. Necessary efforts were made to minimize the influence of secondary factors on this research. However, it is impossible to speak with certainty about the lack of objective and psychological effects of extreme price fluctuations in the market and the change of judgment to brands and their origin. Therefore, it is suggested to conduct similar research in period and provide a deeper insight into the stakeholders of this field, along with comparing the results of the outputs.

In the field of research, generalizability, although generalizability indicators and research quality indicators are at a good level, the results of this research cannot be generalized to all digital and non-digital product markets. Therefore, it is suggested to conduct similar research in

digital appliances such as television or wearable gadgets or the market of non-digital appliances such as clothes or cars. In the research method section, there are still debates regarding the superiority of methods based on parametric statistics compared to methods based on non-parametric statistics; For this reason, it is suggested that another research based on parametric statistics methods and tools be designed and implemented on a wider statistical community. Also, the majority of the statistical population of the participants in this research are educated people, so it is suggested to use more respondents with little or no academic education in future research.

## 7 Conclusion

Investigating the impact of perceived brand innovation (C.P.B.I.) on Customer-Based brand equity (C.B.B.E.) was the main goal of the upcoming research. In this regard, effective factors were extracted by studying the research literature and benefiting from experts' opinions. The extracted factors are under the five dimensions of C.P.B.I., brand awareness, brand association, perceived brand quality, and brand loyalty. These factors will positively affect C.B.B.E. in the form of research hypotheses.

In the following, the conceptual model of the research was presented based on the extracted factors and research hypotheses. It was concluded that the conceptual model has a desirable and significant quality after examining the outputs of the P.L.S. algorithm in the smartPLS software environment. Also, the research hypotheses were confirmed by examining two important outputs of the software, the value of the T statistic and path coefficients (factor loadings). According to the survey results, increasing C.P.B.I. significantly leads to increasing C.B.B.E. Also, among the components of C.B.B.E., C.P.B.I. has the greatest effect on customer loyalty to the brand. After brand loyalty, brand association, brand awareness, and lastly, the Customer's perceived quality of the brand are in the next ranks.

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