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Branding wooden multi-storey construction – Real-estate agents as gatekeepers for enhancing consumer value in housing

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Abstract

Understanding of consumer value expectations in the Finnish multi-storey construction (MSC) markets is limited. Even less information exists on branding in the MSC businesses. Real-estate agents are powerful actors in the housing markets through their intermediary role between construction sector businesses and home purchasers. Despite this, their perceptions on the consumer value expectations or branding possibilities in the MSC markets has not been previously addressed.

In our pilot study, by employing data gathered from real-estate agents from Finland in 2018 (n=65, response rate 14%) we address the following questions: Based on real-estate agents' perceptions, what are the housing value expectations of consumers in the Finnish multi-storey housing markets? Are there branding possibilities in those markets? Could wood be a source for branding in the MSC businesses? The quantitative and qualitative analysis show that branding opportunities exist. However, branding requires enhancing differentiation above traditional product-service thinking, which currently dominates MSC businesses.

Keywords

Binary logistic regression, Business ecosystems, Consumer choices, Differentiation, Housing expectations, Marketing

1. Introduction

Despite long traditions of building detached houses with wood in Finland (e.g., Jussila and Lähtinen 2020), large-scale industrial multi-storey construction (MSC) with wooden structures is a relatively new phenomenon. The reasons for this have been the path dependencies in the construction businesses, and bans of urban wood building by regulation, which since the early 1900s led to practices promoting the usage of concrete in multi-storey construction (e.g., Waugh, 2015, p. 110; Kuzman and Sandberg, 2017; Goh and Loosemoore, 2017).

However, since the 1990s changes the regulation allowing the usage of wood also in the MSC, and the changes in building regulation and development of industrial wood building technologies have been potential drivers for changes in business logics construction businesses. For example, advanced technical innovations in the engineered mass-timber wood products (e.g., cross-laminated timber CLT, laminated veneer lumber LVL), and development of modular building technologies combined with better understanding on fire behaviour, have driven changes in the regulations, which further have opened up possibilities for wooden MSC (Frangi, 2009; Osaragi, 2013; Lindgren and Emmitt, 2017; Lazarevic *et al.*, 2020; Pelli and Lähtinen, 2020).

From the perspective of construction businesses, climate change challenge and urbanization have led to increasing demand for sustainable infrastructures in building and the need for innovations in construction, as the sector accounts for as much as 39% of all carbon emissions in the world (United Nations, 2017). Especially in the urban areas, one reason for the environmental sustainability challenges in building is the usage of concrete, which is non-renewable and energy-intensive (e.g., material manufacturing, transportation) material (Gustavsson and Sathre, 2006).

Since wood is a renewable material storing carbon over the building's life cycle, timber structures have beneficial climate impacts compared to other construction materials (Geng *et al.*, 2017; Hafner and Schäfer, 2017; Hildebrand *et al.*, 2017; Peñaloza *et al.*, 2016; NBHBP, 2019). Furthermore, societal pressures increase the need to develop and scale up building solutions that can better respond to social, economic and environmental sustainability goals, including the global climate change challenge (Lindblad and Schaurte, 2017; Mark-Herbert *et al.*, 2019).

Like many other countries, Finland is also aiming at the transition towards circular bioeconomy. For achieving this goal through renewal of industrial systems, timber-based value-chains including wooden MSC provide prominent opportunities (e.g., Pelli and Lähtinen, 2020). In addition, from the perspective of urbanization, built environments characterized by wooden buildings and the use of renewable construction materials are among top activities in this respect (Bosman and Rotmans, 2016). In Finland, the benefits of wood in urban construction have been concretized also in official national programmes, and for instance the Finnish Government has set a goal to double the use of wood in construction in the next few years (Programme of Prime Minister Sanna Marin's Government, 2019.)

According to Statistics Finland (2020), in the Finnish housing stock, the proportion of detached houses and apartments in multi-storey houses is for both types of dwellings approximately 40%, and the remaining 20% comprises other types of dwellings such as row houses and townhouses. For the past decade multi-storey apartments have been the dominant housing type for new construction in Finland, and for example in 2019 more than 31.500 out of 42.000 dwellings completed were apartments in multi-storey houses (75% of completed dwellings). In Finland owner-occupied housing dominates the markets: over 60% of the dwellings are owner-occupied (both detached houses and multi-storey buildings) and one-third of them are rented (for general descriptions on the ownership structures, see Andersson *et al.*, 2007).

As a judicial arrangement, ownership of multi-storey apartments in Finland organized through housing companies, and the owner-inhabitants are shareholders of these limited liability companies (Lujanen, 2010). Due to this, abreast with power to participate in the management of housing companies, all shareholders are in a position of investors obligated also to take financial responsibilities on their maintenance operations (Lujanen, 2010; Puustinen *et al.*, 2017). Thus, the perceived risks and benefits among home purchasers may strongly affect the market diffusion potential of the wooden MSC in Finland (e.g., Lähtinen *et al.*, 2019).

Academic understanding on the preferences of Finnish homeowners in multi-storey apartments is very narrow, which also reflects in the possibilities of enhancing the wooden MSC market diffusion potential through increase in consumer value creation for urban dwellers. The low interest in the preferences of the homeowners in multi-storey houses has been partly caused by the historical policies and educational work made by non-governmental organizations in the 1900s promoting living in a detached house as “a housing ideal”

(Ruonavaara, 1996). Although the quality of Finnish housing has been found to be of a good quality regardless the type of housing (Norris and Domanski, 2009), path dependencies in the housing market traditions may have stigmatized multi-storey living more as a compulsory choice for people without purchasing power for homes of their needs, than as the primary and highly valued option for dwellers.

According to Andersson *et al.* (2007) in the Finnish housing markets, being a homeowner reflects the aspirations of inhabitants for independence, success, and security, which are perceived to be worth social and economic risks regardless the form of housing. Thus, from the perspective of the business development in the wooden MSC, it would be beneficial both to gain information on the housing value expectations of homeowners in multi-storey houses in general, and more specifically in relation to the value creation potential of usage of wood in building. The share of completed wooden multi-storey apartments in Finland has been growing slowly since 2015 (Karjalainen, 2019). The current proportion of the new wooden MSC apartments in the Finnish housing markets is about 5% (Sipiläinen, 2018). So far, only 1700 apartments have been completed in the wooden MSC houses (Karjalainen, 2019), and most of them have been built for rental housing markets.

However, prospects for the future growth exist and industry experts, for example, are generally positive about the market development of wooden MSC in Finland (e.g., Toppinen, 2019a; Vihemäki *et al.*, 2020). In addition, in recent years an increasing number of companies focusing on the housing company markets have begun to use wooden structures in multi-storey houses. Due to that, for the MSC business development, information on the consumer housing value expectations and views on building with wood among homeowners in multi-storey buildings (see, Viholainen *et al.*, 2020) is needed abreast with the academic understanding on the preferences of tenants in the wooden MSC houses (e.g., Kylkilahti *et al.*, 2020).

In the housing markets, real-estate agents have multiple roles as marketers, sellers and intermediaries, but they also act as advisers (Brinkmann, 2009). Due to their connections with construction firms and communication with home purchasers within business ecosystems, they act as gatekeepers and have information both on the construction businesses and housing value expectations of consumers that may bring entirely new insights to enhance wooden MSC (e.g., Toppinen *et al.*, 2019b). Such practices could include, for example, co-

creation of value within business ecosystems (e.g., Pulkka *et al.*, 2016) and differentiation of housing market offerings through branding (e.g., Wood, 2000).

The overall objective of this exploratory pilot research is to add understanding on consumer housing value expectations in the Finnish multi-storey housing markets, and how wooden MSC could bring value for homeowners and enhance sustainable urbanization. Related to this, our specific aims are to explore 1) what are the most significant housing value expectation of home purchasers when buying an apartment from a multi-storey building, 2) whether different housing value expectations are associated with branding possibilities of multi-storey buildings and what kind of perceptions do real-estate agents have on branding possibilities, and 3) especially what are the tangible (e.g., material properties, technological or environmental benefits) and intangible (e.g., image among consumers, congruence with lifestyle issues) characteristics of wood that could enhance branding possibilities in the MSC businesses. For analysing the results, both quantitative and qualitative methods are employed by utilizing survey data gathered from Finnish real-estate agents in 2018.

2. Literature Review: Construction businesses and roles of real-estate agents in housing markets

Development of business ecosystems characterized by collaboration among different actors connected to building projects and usage of houses have been found as crucial for changes in the construction sector business logic and enhancement of end-user value (e.g., Mokhlesian and Holmen, 2012; Mokhlesian, 2014). Despite this, up-take of the benefits of collaboration and integration of new actors in the value creation has not gained a dominant toehold in the construction sector businesses (e.g., Hemström *et al.*, 2017; Toppinen *et al.*, 2019b; Vihemäki *et al.*, 2020). The reasons for slow development of new types of business ecosystems in the construction sector have been multiple, and largely inter-connected to the path-dependency in the usage of concrete as the main material in the urban building (Pelli and Lähtinen, 2020).

The concept of business ecosystem was first introduced by Moore (1993, p. 85) *“Business communities, unlike biological communities of co-evolving organisms, are social systems. And social systems are made up of real people who make decisions; the larger patterns are maintained by a complex network of choices, which depend, at least in part, on what*

participants are aware of.” As a difference to business networks composed of companies designing, producing, and delivering offerings to customers, business ecosystems comprise also other actors (e.g., Moore, 1998; Heikkilä and Kuivaniemi, 2012). For example in the construction sector, abreast with building companies also customers, architects, designing engineers, material suppliers, real-estate agents and consumers are in interaction with different phases of building and usage of houses, thus belong to the construction sector business ecosystems (see, e.g., Bossink, 2004; Mokhlesian, 2014; Heravi *et al.*, 2015; Toppinen *et al.*, 2019b). Pulkka *et al.* (2016) have applied the business ecosystem concept in the context of construction sector demonstrating its positive impact on value creation in the businesses.

Practices in the MSC businesses have been developed through the material properties of concrete, which compared to wood is a heavy material (Urban, 2012, p. 10). As a result of this, concrete-based MSC is typically characterized by low level of modular prefabrication combined with on-site production, where project-based subcontracting is a dominant business regime (Goh and Loosemore, 2017). In these systems, actors involved in the construction processes (e.g., materials, technologies) have been in the centre of the business development, while those being involved in the use of buildings (e.g., real estate agents, end users) have gained less attention (e.g., Viholainen *et al.*, 2020). According to Toppinen *et al.* (2019b), in the context of a business ecosystem, collaboration and shared logic of value creation may help to increase knowledge accumulation concerning wooden MSC. Since there may have not been any connections with the consumers during the production phases (Segerstedt and Olofsson, 2010), also understanding on end user preferences found to be crucial for value creation (e.g., Pynnönen *et al.*, 2012) has been narrow in the MSC businesses.

Although the development of business ecosystems is more than a technological issue, innovations in engineered wood products and industrialization of building systems have paved the way also to break the path dependencies in the concrete-based construction businesses: Compared to concrete-based MSC, the level of industrialization is higher in the wooden MSC due to the modular prefabrication and off-site production (Brege *et al.*, 2013). As a result of this, industrialization has also been a driver for long-term collaboration relationship development and accumulation of knowledge by common learning within wood building business networks (Toppinen *et al.*, 2019a). For example, consumers interested in the wood

building may also be innovators bringing new practices in building design (e.g., Nordin *et al.*, 2010). This is a practical example on how actors beyond the companies' collaboration networks may contribute to the development of business ecosystems.

Especially for the construction businesses with higher aspirations to sustainability, the benefits from collaboration are multiple and related to reputational gains (e.g., company image and resilient products), long-term viability (e.g., efficiency, innovation, improved stakeholder relations), and finance (e.g., new market opportunities, competitiveness) (Abuzeinab *et al.*, 2018). Thus, from the perspective of sustainable urbanization, actors outside of traditional business networks may bring entirely new insights also on the wooden MSC with multiple benefits both for the businesses, end users and society (Figure 1). In practice, the roles of actors in the business ecosystems may vary, e.g., depending on individual projects (e.g., in some wooden MSC projects material manufacturers may have taken the role of building developers, or urban planners have been in important roles in land zoning to launch the construction project) (e.g., Toppinen *et al.*, 2019b).

In addition, real-estate agents with local housing market knowledge are in an important role in the housing markets (Agarwal *et al.*, 2019; Viholainen *et al.*, 2020). From the perspective of power the role of real-estate agents in relation to other actors especially in the MSC markets vary: while building developers involved either in social housing markets or acting as investors have also direct power in the construction processes, consumers and future homeowners are commonly in connection with building projects to be completed only through real-estate agents. As a result of this, real-estate agents working either in separate firms or within marketing units of construction companies are the main informant between builders and future homeowners with experiences on the preferences and value expectations of home purchasers. In Toppinen *et al.* (2019 b), it was found that real-estate agents may conduct most of the communication with the homeowners during the residential building project.

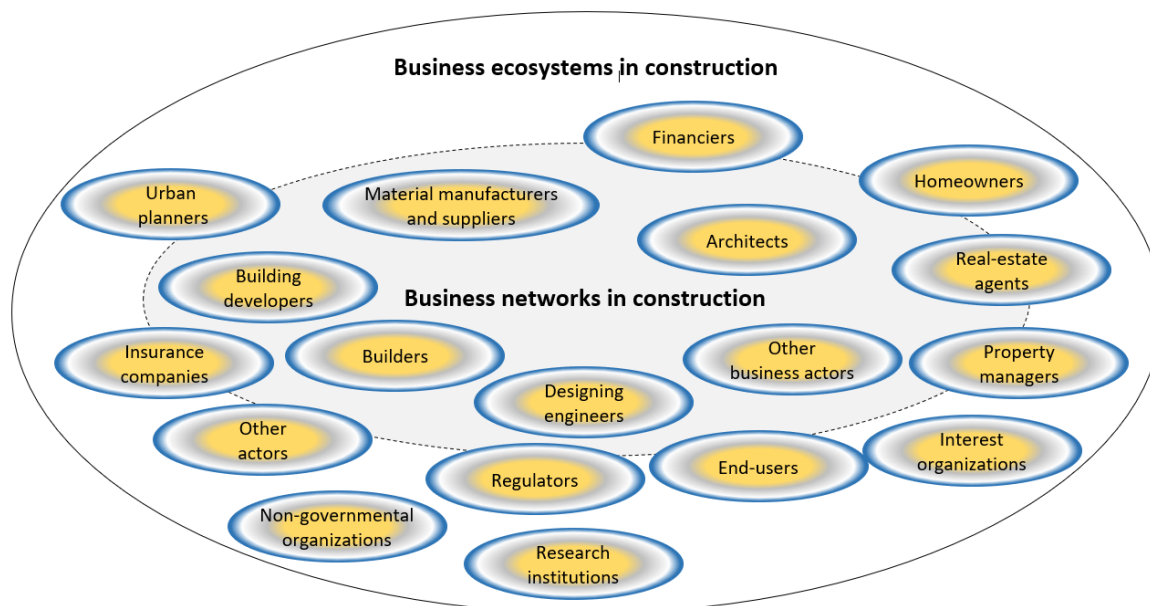


Figure 1. Examples on the actors involved in the construction sector business networks and business ecosystems in the homebuilding sector (mod. Moore, 1998; Heikkilä and Kuivaniemi, 2012)

In home purchasing, consumers need to manage a large amount of information connected to the characteristics of houses, and to their preferences (i.e., the ones of individuals and family) on housing (Coolen and Hoekstra, 2001; Levy and Lee, 2004; Sirgy *et al.*, 2005; Kauko, 2006a; Kauko, 2006b; Marsh and Gibb, 2011; Gibler and Tyvima, 2014; Hasu, 2018). According to Brinkmann (2009), real-estate agents have several positions in the housing markets: they act as marketers, sellers and intermediaries, but they also are in positions of partial and impartial advisers as information deliverers.

In their profession, real-estate agents acquire a pool of sellers and purchasers (i.e., building of an image of a “good person” through individual relational and social properties), foster the shared beliefs on the “market realities” of a specific point of time, and support the possibilities of home sellers and home purchasers to make “right” decisions in the housing markets based on pricing and taste (i.e., value expectations on housing) (Benites-Gambirazio, 2020). Thus, as advisers and information deliverers they are powerful actors in the housing markets, who may also persuade purchasers to make choices based on their own knowledge and motivations, and the competency and ethics in advice-giving affect whether interests of sellers and purchasers have been equally met in the apartment deals (Brinkmann, 2009).

The approach of this study to employ real-estate agents as informants on the views of home purchasers is not new: For example Levy and Lee (2004) gathered information from the real-estate agents to assess the role of family dynamics in home purchasing processes in New Zealand, and Kidwell *et al.* (2011) assessed the impacts of emotional intelligence of the real-estate agents on their perceived marketing performance with future homeowners in the United States. In addition, in a recent study Wong *et al.* (2020) utilized real-estate agents as one group of property practitioners to evaluate how housing market stakeholders (i.e., homeowners, tenants and investors) perceive the importance of different life-cycle sustainability aspects in housing in Australia.

3. Theoretical framework: Branding in the housing markets

Brand is a comprehensive promise composed of real or illusory, rational or emotional, tangible or invisible bundles of attributes bought for satisfaction of the purchasers (Ambler and Styles, 1997). According to Keller and Lehmann (2006), brands have several valuable functions in three primary levels: customer market, product market, and financial market. Brand equity refers to the value accrued by these benefits and can be defined as a set of brand assets linked to a brand's name and symbol that adds to (or subtracts from) the value provided by a product or service to the customers of a company (Aaker, 2009).

Brands can be seen as company's offerings and as a promise of a certain quality level for customers. From a customer's perspective, different brands can simplify choice, reduce risk and engender trust. Brands reflect the experience the customer has with different products and the effectiveness of a company's marketing efforts, and additionally, brands can be seen as financial assets (Keller and Lehmann, 2006). The development of brands occurs in the interface between value creation inputs (i.e., attributes) created within businesses for consumers, and the perceptions of consumers on the coherence of those attributes with their own emotional and functional needs, and perceptions on self-identity (e.g., lifestyle issues) (de Chernatony and Dall'Olmo Riley, 1998).

According to Keller (2003), branding contains the process of endowing products and services with the advantages that accrue to building a strong brand. To improve the brand equity, brands have to be linked to other entities, for example, people, places, things, or other brands.

Awareness, attributes, benefits, images, thoughts, feelings, attitudes, and experiences represent different kinds of information that may become linked to a brand and be seen as some of the key dimensions of brand knowledge. They can become a part of consumer memory and thus affect consumer responses to marketing activities (Keller, 2003). The overall purpose of branding is to differentiate specific market offerings sold by businesses (i.e., individual firms or groups of firms) to strengthen their competitive position in the markets (e.g., Wood, 2000).

Abreast with product-service entities, also places (e.g., living environments in particular locations) and homes (e.g., dwellings in urban settings) may be targets for differentiation and branding (e.g., Jansson and Power, 2006; Ashworth, 2009; Hankinson, 2009; Johansson, 2012; Foroudi *et al.*, 2016; Ouwehand and Bosch, 2016; Ma *et al.*, 2019). According to Jansson and Power (2006), place branding strategies usually include two different aspects: the material characteristics of the place (e.g., structures and events) and the nonmaterial aspects (e.g., stories, slogans, and logos).

Also, brand culture, organizational coordination, stakeholders' participation, leadership and brand communications (Hankinson, 2009) and personality association, signature building, and event hallmarking (Ashworth, 2009) have been seen to be relevant factors of place branding. Ouwehand and Bosch (2016) studied branding new middle-class dwelling complexes within urban renewal projects in the Netherlands. According to their results, branding is about planning a sense of home and it can inspire decisions about the functional and design features of dwellings abreast with thinking about residents' future social familiarity, safety, and identification with their environment. Also, "lifestyle profiling" is often included and residential preferences and consumer group's lifestyle are taken into consideration.

Like in any other consumer choices, also the perceived value of housing is affected by both consumer self-identity (e.g., lifestyle, image in the eyes of others) (Sirgy *et al.*, 2001; Gibler and Tyvimaa, 2014), attitudes and norms (e.g., Coolen and Hoekstra, 2001), and characteristics of houses and living environments (e.g., Kauko, 2006a). Thus, also for construction businesses, investments in brand development based on, for example, consumer value expectations on responsibility of businesses (e.g., environmental and social

sustainability in businesses) (Mark-Herbert and von Schantz, 2007) may be a source for competitive advantage.

In the competitive housing markets, apartment branding has been found to lead to stronger sales performances over non-branded apartments in the same residential district (Choi *et al.*, 2017). However, location may also be a barrier to maintain loyal customers of a brand apartment, if they realize that the main cause for perceiving superiority over other apartments seems to depend on the apartment's location, not its brand. Thus, the benefits of location superiority and monetary value in an apartment property cannot be easily replaced with any other element of brand equity (Choi *et al.*, 2017).

According to Kauko (2006a), consumer housing value expectations may be seen as a bundle of attributes related to physical characteristics of houses (e.g., materials, housing technologies, floorplans) and locational qualities (e.g., distances to services or attractiveness and reputation of the residential area). Based on those attributes, Kauko (2006b) has introduced a Housing Property Value (HPV) model, which in this study was employed to assess significance of different aspects of housing value creation among future MSC homeowners.

Earlier the model has been employed to quantitatively assess consumer housing expectations, for example, in Finland (Kauko 2006b) and in the Nordic region (Lähtinen *et al.* 2021). In relation to branding, these attributes connect to product-service entities, homes and places (Jansson and Power, 2006; Ashworth, 2009; Hankinson, 2009; Johansson, 2012; Foroudi *et al.*, 2016; Ouwehand and Bosch, 2016; Ma *et al.*, 2019). Thus, branding of multi-storey wooden buildings may be connected to differentiation based directly to the properties of wood or wood building technologies and design, or more indirectly to strategic choices made within businesses to meet broader housing expectations within the target consumer segments.

4. Methods

4.1 Survey design and data collection

Prior to data gathering, contact information of 474 real-estate agents were collected from the real-estate companies' websites. Member companies of the Central Federation of Finnish Real Estate Agencies were considered as a starting point on collection, which were also

supplemented with information from agents outside the federation (e.g., real-estate agents working in home selling in large construction companies). This resulted in 474 contact information of real-estate agents operating in Finland, that composed the sample of this study. After this, with consideration on findings made on web survey design (e.g., Kaplowitz *et al.*, 2012) the survey designed in Google docs form was submitted in November 2018 by email to the real-estate agents in the sample. After three rounds of reminders sent by email, 65 real-estate agents had responded leading to response rate of 14%.

Response rates in web surveys are commonly lower than in other ways of survey data gathering (e.g., mail, telephone) (Fan and Yang, 2010). Although response rate has an impact on the representativeness of the data (e.g., Baruch, 1999), in survey research high response rate does not unambiguously mean that the data are representative, or low response rate unequivocally mean that the data are not representative (Cook *et al.*, 2000). For example, this is due to the potential impacts of social desirability bias (i.e., respondents may have trouble to be honest with sensitive issues) (Nederhof, 1985), or incorrect answer bias (i.e., respondents without adequate knowledge may misunderstand the questions) (Sjöström *et al.*, 1999). Thus, if comparing high response rate data (in which the potential impacts of biases have not been taken into account at the data gathering phase) with low response rate data (in which the potential impacts of biases have been taken into account in the data collection) in statistical terms the predictive power of data with lower response rate may be in statistical measures significantly higher (Krosnick, 1999).

In this study, special attention was paid to ensure the representativeness of the data through several procedures. First, the contact information of the real-estate agents was manually gathered from the internet to ensure that the recipients were working as real-estate agents in the private housing markets and they have adequate knowledge of the survey themes. Second, the respondents were given an opportunity to respond in the survey anonymously to minimize impacts of social desirability bias (i.e., identity of the respondents was not checked, and reminders were sent for all survey recipients). Third, all rating-scale points were labelled both with numbers and words, and one open-ended question was presented to give a possibility for respondents to, for example, complement issues discussed in the structured questions (see, e.g., Krosnick, 1999).

The reasons for non-response bias were evaluated with the email feedback received from the respondents, since contacting non-respondents was not possible due to the strictly anonymous approach in the data gathering process. According to the feedback given by respondents in their comments on the survey, the reasons for delays in responding (and possibly also for non-response) were mainly related to the general busy schedules of the real-estate agents in the working lives. Instead of comparing the groups of respondents and the ones who had not filled in the questionnaire, the non-response analysis was conducted by comparing the background characteristics of on-time (n=26) and late respondents (n=19) (Lindner *et al.*, 2001). This was implemented by employing information gathered in the survey from the respondents on their age group, years of working as a real estate agent or related tasks, years of working in the current position, type of a real estate agency and regions of operations, and experience in selling apartments in MSC made with wooden structure (at least 2 floors). The comparisons (at the 0.05 probability level) didn't reveal statistically significant differences between respondents classified according to the background variables (Figure 2–6). Thus, for the purpose of this exploratory pilot study, the response rate was considered to be at an adequate level especially when taking into account that other issues to ensure the representativeness of the data were profoundly taken into account at all phases of the data gathering process.

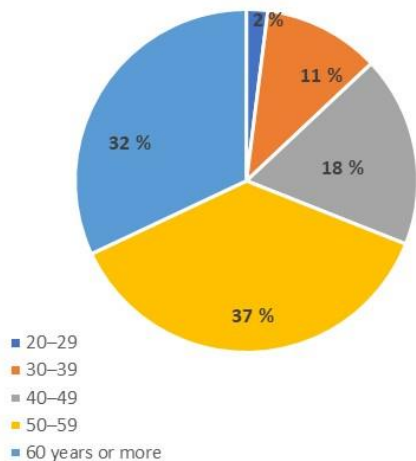


Figure 2. Age of the respondents (n=65).

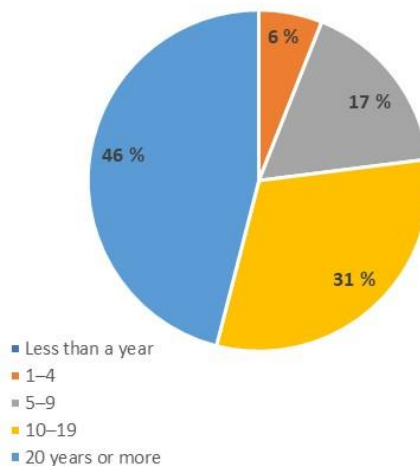


Figure 3. Respondents' working experience as a real-estate agent or related tasks (n=65).

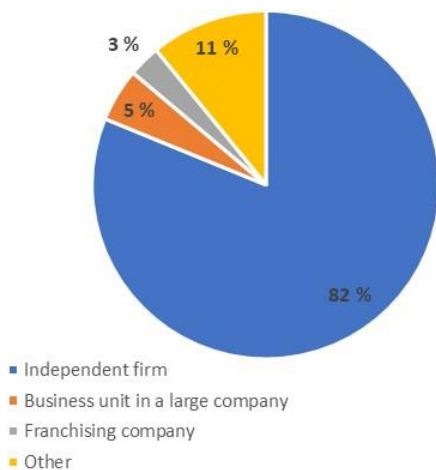


Figure 4. Employers of the respondents (n=65).

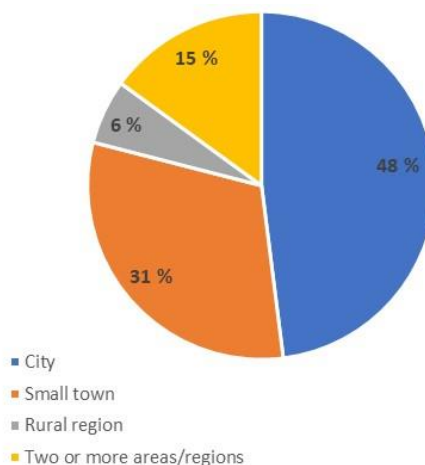


Figure 5. Business regions of the respondents (n=65).

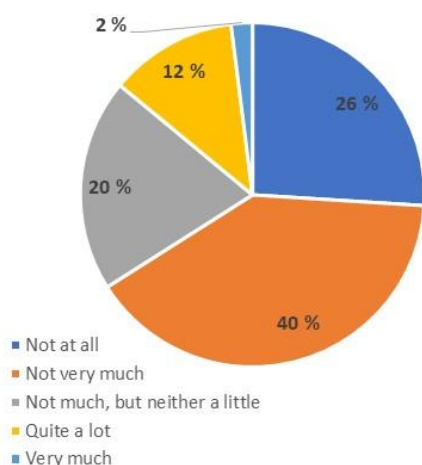


Figure 6. Respondents' experience in selling apartments in multi-storey houses (min. 2 floors) made with wooden structures.

The survey consisted of mostly structured questions with one open question. In most of the questions, real-estate agents were asked to state their perceptions of the preferences of buyers interested in apartments located in the multi-storey houses in Finland. In addition, the survey also comprised few questions about real estate agents' own views, for example, on the properties of different structural materials in multi-storey construction, and about their background characteristics. Queried themes contained statements on the significance of different value creation components in multi-storey housing at the phase of buying a new apartment, branding possibilities of multi-storey buildings, customers' attitudes towards different structural materials and their perceptions of the properties of different structural materials. Questionnaire also included other quantitative questions related to the themes, which are in the focus of this study and thus not reported in the context of this article. For survey, the value creation attributes in the HPV model were operationalized into statements by employing supplementary research literature on the issues found to be important for home purchasers in case of different types of dwellings and geographical contexts (e.g., Coolen and Hoekstra, 2001; Levy and Lee, 2004; Levy *et al.*, 2008; Sirgy *et al.*, 2005; Gibler and Tyvima, 2014).

4.2 Quantitative and qualitative analysis

All data analyses of the study were implemented with IBM SPSS Statistics 25.0 software. At the first stage of analysis, five questions measuring the significance of the value creation attributes in the MSC were first analysed using basic descriptive statistics (Appendix 1). Each of the questions included 4–8 statements (i.e., variables) describing *Residential area* (6 items), *Location* (7 statements), *Housing* (4 items), *Apartment* (8), and *Building* (8 items). The perceptions of the real-estate agents on consumer housing expectations were identified by asking them to rate the significance of the 33 value creation attributes using a five-point Likert scale from 1 to 5, where 1 stood for the weakest meaning and 5 corresponds to the most important meaning (1=Not important at all, 2=Not very important, 3=Not important, but also not insignificant, 4=Quite important, 5=Very important).

At the second stage of analysis, the statements (see Appendix 1) were condensed into a smaller set of variables by forming summative variables on the general themes describing housing value expectations among Finnish home purchasers. The purpose of this procedure

was to enhance the clarity of analysis and strengthen the interpretation of results through well-articulated themes presented also in the previous literature on consumer housing expectations (e.g., Kauko, 2006a; Gibler and Tyvima, 2014), and branding in the context of housing (e.g., Foroudi *et al.*, 2016; Ouwehand and Bosch, 2016; Ma *et al.*, 2019).

As a result of the procedure, a total of five summative variables were compiled of each of the sub-questions and dividing the value obtained by the number of variables: *Location* (e.g., distances and accessibility to work, schools, and free-time services), *Residential area* (e.g., tranquillity, safety, image and age structure of neighbourhood), *Housing* (e.g., shared spaces indoors and outdoors, design of courtyards for different purposes such as spending time and car parking), *Building* (e.g., safety of building structures, environmental friendliness of the structural materials, spacy stairways, architectural design), and *Apartment* (e.g., layout of the floorplan, reasonable living costs (e.g., energy efficiency) through appropriate household technologies enhancing, easiness of living supported by good property maintenance services).

At the third stage of analysis, the five summative variables were employed as independent variables to implement binary logistic regression (BLR) analysis (e.g., Pampel, 2009; Hilbe, 2009). The method suits well for analysing an empirical phenomenon with qualitative characteristics that cannot be described with continuous interval-level numerical values (Walsh, 1997). The regression coefficients (i.e., independent variables) describe the probability of the existence of a phenomenon described with a dichotomous dependent variable (Kaufmann, 1996).

Forming the dichotomous dependent variable in the analysis of this study was based on responses of real-estate agents on question *“Do you see possibilities in multi-storey housing branding through solutions related to building phases of multi-storey houses?”*. *“Yes”* indicated the existence of branding possibilities (i.e., value 1) and *“No”* non-existence of branding possibilities (i.e., value 0). For supporting the interpretation of the quantitative results, respondents were also asked to justify their answers on *“Yes”* or *“No”* options with an open-ended question: *“If you responded “Yes”, how would it be possible to develop branding in multi-storey construction at the phase of design and building? If you responded “No”, why do you see there are no possibilities for branding?”*. In all, 80% of the respondents perceived it as a feasible development opportunity to develop multi-storey construction

businesses (i.e., “Yes” answers for the dichotomous variable assessing the existence of branding possibilities).

The strength of the BLR analysis is the possibility to receive illustrative information whether dependent variable increases (positive coefficient sign) or decreases (negative coefficient sign) likelihood of an event (e.g., Peng *et al.*, 2002). In the empirical analysis of this study, the summative variables (i.e., *Location, Residential area, Housing, Building and Apartment*) were employed as independent variables to describe the increase or decrease in the probability of the branding possibilities depicted with a dichotomous dependent variable.

The challenge of BLR analysis is in the interpretation of the scale of change in the dependent variable depicted by coefficients, that may sometimes even suffer from a lack of intuitive meaningfulness (e.g., Kaufman, 1996; Pampel, 2009). The focus of this study was to explore whether branding possibilities seem to even exist in the multi-storey construction, and how the possibilities might be related to the usage of wood in building. Due to that, in the context of this study making any interpretations on the magnitude of change in the branding possibilities caused by sum variables was not a relevant issue.

The soundness of the BLR analysis solution was evaluated in reference to the overall model, statistical tests of individual predictors, goodness-of-fit statistics, and validations of predicted probabilities (e.g., Peng *et al.*, 2002). Cox & Snell R^2 and Nagelkerke R^2 were assessed as indicative fit indexes by comparing them with other tested models’ R^2 values. Hosmer and Lemeshow (H&L) test was employed to evaluate the adequacy of the logit model. The predictive efficiency of the model was assessed by comparing predicted and observed group memberships and Wald’s χ^2 test was employed to test the statistical significance of β coefficients. Threshold levels of p-values were applied as <0.01 indicating strong evidence on statistical significance, $0.05 \leq 0.01$ indicating evidence on statistical significance and $0.10 \leq 0.05$ indicating suggestive evidence on statistical significance.

To gain information on the special views related to multi-storey wood construction, in the analysis the results on the potential of branding in the multi-storey construction were also connected with general information (e.g., percentages, averages) related to the variables describing different aspects of structural materials. In the survey, one question connected to

structural materials addressed how real-estate agents perceive the attitudes of consumers towards different structural materials (concrete, wood, brick and stone), when buying a multi-storey house apartment. The variables in the five-point Likert scale were identified both in numerical and verbal forms (i.e., 1=Very negative attitudes among home purchasers towards structural material in question, 2=Quite negative attitudes..., 3=Neither negative, nor positive attitudes..., 4=Quite positive attitudes..., 5=Very positive attitudes among home purchasers towards structural material in question).

Abreast with the general attitudes towards different structural materials among home purchasers evaluated according to the perceptions of the real-estate agents, another question in the survey addressed more in detail the consumer views on the properties of materials. Related to that, real-estate agents were asked to evaluate according to their experiences on how home purchasers perceive the aspects of ecological sustainability, technical solidity, cost-efficiency, healthiness and fire safety in relation to concrete, wood, brick and stone in multi-storey building structures.

In addition, for gaining information whether the own perceptions and knowledge of real-estate agents on different material properties seemed to affect their observations on the consumer attitudes, the real-estate agents were asked to state in a separate question their own views on the ecological sustainability, technical solidity, cost-efficiency, healthiness and fire safety of the structural materials used in the MSC. As response options for both questions (i.e., the one addressing the views of consumers, and another connected to opinions of real-estate agents), it was possible to select all options that seemed to be relevant for each of materials (i.e., for all materials it was possible to select 1–5 properties).

5. Results and discussion

5.1 Branding possibilities related to consumer housing value expectations

The summative variables calculated from the individual statements (see Appendix 1) describing more general themes on consumer housing value expectations revealed that according to the perceptions of the real-estate agents, the *Apartment* has the most important meaning (mean 3.7) followed by the *Location* (mean 3.6) and *Residential area* (mean 3.4), while they considered *Building* and *Housing* (means 3.2) to be the least significant.

According to the BLR analysis results (Table 1), statistical evidence on the differentiation opportunities in the MSC businesses seem to exist. According to statistical measures, Omnibus tests ($p=0.009$) suggest that a model is significantly better compared to a model comprising a constant term only. In addition, H&L test ($p=0.645$) indicates that the model is fit to the data well as no difference exists between the observed and predicted value of the model variables. Correctly classified ratio of observations is 80%. Cox & Snell R^2 (0.210) and Nagelkerke R^2 (0.332) values show that the model explains 21–33.2% of the variation of the explained variable. Thus, other versions of the model were assessed by reducing the non-significant variables from the model, but we ended up with the chosen model due to its better fit to the data.

Table 1. Binary logistic regression (BLR) model on the association between consumer value expectations and possibilities to develop the branding in the multi-storey housing (1=Branding possibilities exist, 0=Branding possibilities do not exist).

Independent variable	β	SE β	Wald's χ^2	p	e^β
Constant	3.256	4.676	0.485	0.486	25.942
Location	2.432	1.026	5.618	0.018**	11.383
Residential area	0.798	0.728	1.200	0.273	2.220
Housing	-1.316	0.841	2.448	0.118	0.268
Building	1.168	0.655	3.180	0.075*	3.217
Apartment	-3.294	1.372	5.765	0.016**	0.037

*suggestive evidence on statistical significance, **evidence on statistical significance, ***strong evidence on statistical significance, $\chi^2 = \text{sig. } 0.009$; Cox & Snell R^2 0,210; and Nagelkerke R^2 =0.332; Predictive accuracy = 80 %.

As detailed description of BLR model results, probability of *Location* (e.g., distance and accessibility to work, schools, and free-time services) to affect branding possibilities is statistically significant ($p=0.018$). Thus, as an empirical interpretation, positive beta coefficient of location (2.432) indicates that as the significance of location for the buyer increases, the likelihood of branding possibilities increases. Moreover, the positive beta coefficient (1.168) of *Building* (e.g., safety of building structures, environmental friendliness of the structural materials, spacy stairways, architectural design) also indicates that solutions connected to characteristics of houses (e.g., structural materials, environmental impacts, or housing technologies) may increase possibilities for branding: Even though the statistical evidence on this is not statistically strong, the p-value (0.075) tentatively suggests that the importance of

the building characteristics for the buyer may also increase the likelihood of branding possibilities.

In contrast, increasing the focus on the *Apartment* (e.g., layout of the floorplan, reasonable living costs through appropriate household technologies enhancing, easiness of living supported by good property maintenance services) may decrease the likelihood of potential for branding. In the model, the sum variable *Apartment* has a negative beta coefficient (-3.294) with statistical significance (p-value 0.016). Instead of being contradictory to the results on the means of summative variables (e.g., according to the perceptions of the real-estate agents, consumers value most the properties of an apartment when choosing home in a new multi-storey house), the BLR results more describe how as a difference to current prevalent practices, businesses could seek new sources for competitiveness through differentiation. As found, for example, in the study of Choi *et al.* (2017), in housing branding the benefits of location cannot be replaced solely with differentiation in the properties of apartments. Thus, although the properties of the apartment are important for the purchasers, another story is whether as such the properties of apartments could be a source for differentiation and competitiveness in the markets.

In the case of Finland, there are two more specific explanations on the modelling result. First, related to the situation nowadays, in the Finnish multi-storey housing markets, in most of the cases, purchasers can already significantly affect the properties of apartments in the new multi-storey houses (e.g., location of power sockets, faucets, surface materials, home appliances, number and amount of cabins), if the bid is being made already at the phase of building. Second, regarding historical national traditions, multi-storey housing was promoted and seen in Finland for a hundred years (see, e.g., Ruonavaara, 1996) as a way of living for people who for a reason or another had no opportunities to have a house of their own. During the 1960s and 1970s, perceiving multi-storey housing as an inferior to detached house living was strengthened by quantity-oriented concrete-based mass housing production in the suburban locations with stigmatized reputation (see, e.g., Kaasalainen and Huuhka, 2015; Huuhka and Saarimaa, 2018).

Thus, especially in Finland, branding in MSC appears to be a hierarchical construct, in which focusing merely on tangible properties of apartments (or even houses) is not sufficient for differentiation in the eyes of home purchasers. Instead, understanding of multi-faceted

phenomena of consumer housing value expectations related, for example, on the self-image of purchasers is needed. These results are supporting the benefits of location superiority over apartment branding and the proposed implications that an apartment brand that mostly selects a location with promising real-estate value and convenience would gain credibility from its customers leading to improved brand image as noted by Choi *et al.* (2017).

In addition, since in the Finnish housing markets homeowners in the multi-storey houses are also shareholders with financial responsibilities in the housing companies (e.g., Lujanen, 2010), especially in the case of new building technologies, issues related to perceived risks related to properties of structural materials and construction technologies need to be taken into account. Approaches on how this could be addressed in relation to new value creation and branding in the MSC businesses is covered more profoundly in the qualitative results section.

These results are interesting in the light that due to strong path-dependencies in the technology-driven industrial practices, construction companies have not traditionally considered the customers' views on the MSC processes. Especially in Finland this was realized in the concrete-based mass housing production in the 1960s and 1970s (e.g., Kaasalainen and Huuhka, 2015). In Norway, Høibø *et al.* (2015) studied people' perceptions on different building materials and demonstrated that people can be more uncertain about structural materials compared to indoor or cladding materials. Especially in the case of shareholders in housing companies (e.g., in Finland), perceived financial risk related to the usage of new structural materials and building technologies may be a very important factor affecting the potential for wooden MSC market diffusion among homeowners.

5.2 Perceptions of the real-estate agents on the branding possibilities

The responses on the open-ended question connected to reasons why real-estate agents either saw or did not see branding possibilities in the MSC enabled understanding better the qualitative and empirical details behind the BLR model results. In all, altogether 52 real-estate agents (i.e., 80% of the respondents), saw possibilities for branding in multi-storey construction. Approximately half of them described either only from general points of views why possibilities seem to exist (e.g., organizing collaborative meetings among different actors, providing possibilities for the buyers to participate in the planning at one or different stages

of the construction process, and openness in communication), or did not explain in any way motivation on their opinions. The other half of the real-estate agents with positive attitudes towards the branding possibilities in the MSC businesses mentioned in more detail either issues related to aesthetics and architectural quality of buildings, or possibilities of purchasers to participate in the design of their homes (e.g., floorplans, spaces for storage). These views with specific ideas and explanations on the aspects relevant in branding development are elaborated by the quotes in Table 2.

Table 2. Ideas and explanations mentioned by the real-estate agents with beliefs towards branding in the multi-storey construction (MSC) businesses.

Respondent	Example	Quote
Real-estate agent working in a city	1	<i>"Distinctive solutions [in multi-storey houses], which have good fit with the milieu, "bulk" is built a lot, all [multi-storey houses] look alike."</i>
Real-estate agent working in a rural region	2	<i>"By taking into account the [design of] other buildings in the vicinity and recent past of the neighbourhood, they would fit better also with the other buildings and neighbourhood."</i>
Real-estate agent working in a city	3	<i>"For example, stairways. Sometimes the potential purchaser loses the feeling to buy already in the stairway and that is difficult to fix. In a similar way, if the facade is 'unattractive', the customer has mentioned the building to be the ugliest building in the street. ...On the other hand, many people have come to see the apartment only for the reason, that they have considered the building to be beautiful."</i>
Real-estate agent working in two or more areas/regions	4	<i>"Pre-marketing would take more buyers into account. Buyers should be given the opportunity to outline and participate in the design of their own home. Planners/designers/architects are too far from the wishes of buyers."</i>
Real-estate agent working in a small town	5	<i>"Involving prospective buyers immediately in the overall design of their apartment. There should be rough drafts, but otherwise solutions could be discussed from the beginning."</i>
Real-estate agent working in a city	6	<i>Communicating openly energy, sound insulation, window, waste management, courtyard and parking space solutions."</i>
Real-estate agent working in a city	7	<i>"Many purchasers consider the reputation of the construction company as important."</i>

The quotes in Table 2 concretize well the empirical interpretation of the BLR analysis results illustrated earlier. Especially Examples 1 and 2 describe how a specific building is connected to its other neighbourhood, which may have special value properties due to the attractiveness of the milieu (e.g., Kauko, 2006a). From the perspective of consumer self-identity in housing (e.g., Sirgy *et al.*, 2001; Gibler and Tyvima, 2014), Example 3 shows how interest in apartments may be dependent on properties of houses, which are not directly connected to any of the properties of apartments. Thus, especially for the home purchasers desiring to have a good impression in the eyes of the others, perceived aesthetics of the exteriors and common

spaces of houses may have special meaning for the perceived consumer value in multi-storey housing.

Examples 4 and 5 are connected increase the possibilities for home purchasers to participate in the designs of their homes not from the perspective of surfaces, but also in relation to layouts, which the technology driven mass housing production has not been a common practice (e.g., Kaasalainen and Huuhka, 2015). This strongly relates to business ecosystem thinking, in which co-creation of value with consumers is seen as a prominent opportunity for changes also in the construction sector businesses (e.g., Pulkka *et al.*, 2016). Finally, Examples 6 and 7 are linked with building trust with home purchasers both from the perspective of solutions in technologies, organization of issues affecting the sustainability of living and easiness of daily life, and financial risk attached to the quality of building. For example, in the study of Mark-Herbert and von Schantz (2007) investments in responsibility of businesses was found as one avenue for building brands in construction businesses. In addition, since in the housing companies all shareholders are financially responsible for the maintenance and repair costs of the buildings (e.g., Puustinen *et al.*, 2017), from the perspective of branding opportunities, transparent communication and building of trust between builders and future homeowners may be of a special value.

Abreast with answers of the respondents seeing possibilities in the MSC branding, also the views of those with more sceptical attitudes provide information on issues affecting the value creation in the businesses. Especially due to the role of real-estate agents as marketers, sellers and intermediaries in the housing markets, the quotes in Table 3 add understanding on the diverse aspects that may be obstacles for differentiation and brand development within companies through, for example, new actor roles and business ecosystem thinking.

Table 3. Opinions of the real-estate agents with doubts about the possibilities of branding in the multi-storey construction (MSC) businesses.

Respondent	Example	Quote
Real-estate agent working in a city	8	"[Branding is possible] only if the location is excellent."
Real-estate agent working in a rural region	9	"More important than branding are the basic facts sought by the purchasers. "
Real-estate agent working in a city	10	"Branding is pure nonsense. "
Real-estate agent working in a city	11	"Branding is the own choice of the builders. "
Real-estate agent working in a small town	12	" Several opinions [of different actors] may only hinder the progress in the [building] process. "

Regarding the contents in Table 2, more than being sceptic towards branding as a potential phenomenon for differentiation in the MSC businesses, Example 8 supports the findings of both quantitative and qualitative results of this study. It is also in line with the findings made in previous research (e.g., Choi et al., 2017) on the importance of location as a prerequisite for branding in the housing markets. From the perspective of marketing capability and attitudes among real-estate agents, Examples 9 and 10 show that there may also be a lack of understanding among real-estate agents on the conceptual meaning of branding, or the empirical evidence of successful branding in the housing markets (e.g., Ouwehand and Bosch, 2016). In reference to this, since differentiation is the premise for branding in the markets (e.g., Wood, 2000), the "basic facts" linked to housing value expectations may vary considerably among different types of consumers. Example 11 shows that on the other hand not all real-estate agents necessarily see the potential of themselves within the construction sector business systems intermediates, who could enhance co-creation of value. It is also possible that some of the real-estate agents do not see needs for business renewal in the construction businesses like addressed in Example 12, neither perceive needs for increase in consumers value creation through new types of practices.

5.3 Opportunities for the wooden multi-storey construction (MSC) market diffusion through increase in consumer value and branding

Related to the potential of wood to be connected with the branding possibilities in the Finnish housing markets, the real-estate agents were also asked to describe according to their knowledge and experiences, how consumers perceive different structural materials (concrete,

wood, brick, stone, which are the most common structural materials for homes in Finland) during the purchasing processes of multi-storey house apartments. According to the results, real-estate agents evaluated consumers to perceive stone as the most favourably material (mean 4.1) followed by brick and concrete (means 4.0 and 3.9, respectively). In this context, it was also tested whether wood and other structural materials seemed to be associated with the branding possibilities by comparing means (i.e., favourability of different materials in structures) in two different groups of branding possibilities (i.e., “Yes” an “No” answers for the dichotomous variable), but statistically significant differences were not found.

Compared to other materials, real-estate agents perceived consumers to have most negative attitudes towards wood (mean 3.1). According to the experiences of real-estate agents (Figure 7), consumers perceive wood mainly as an ecological (75%) and healthy (55%) material. In comparison, real-estate agents had observed concrete, brick and stone to be the structural materials, which consumers perceive mainly as technically strong (72%, 58%, 74%) and fire safe (63%, 65%, 74% respectively). In addition, brick and stone were also evaluated by the real-estate agents to be healthy options in building structures (31%, 34%) in the eyes of the future home purchasers. Furthermore, according to the experiences of real-estate agents, consumers consider concrete also as a cost-effective construction material (43%). From the perspective of short-term branding opportunities related directly to the properties of wood in the MSC, knowledge on the tangible properties of timber structures seem to be a weakness. Related to this, none of the real-estate agents thought consumers to consider wood as a fire safe material in the MSC structures, and only 2% of them perceived consumers to appreciate the technical solidity of wood as a structural material in buildings.

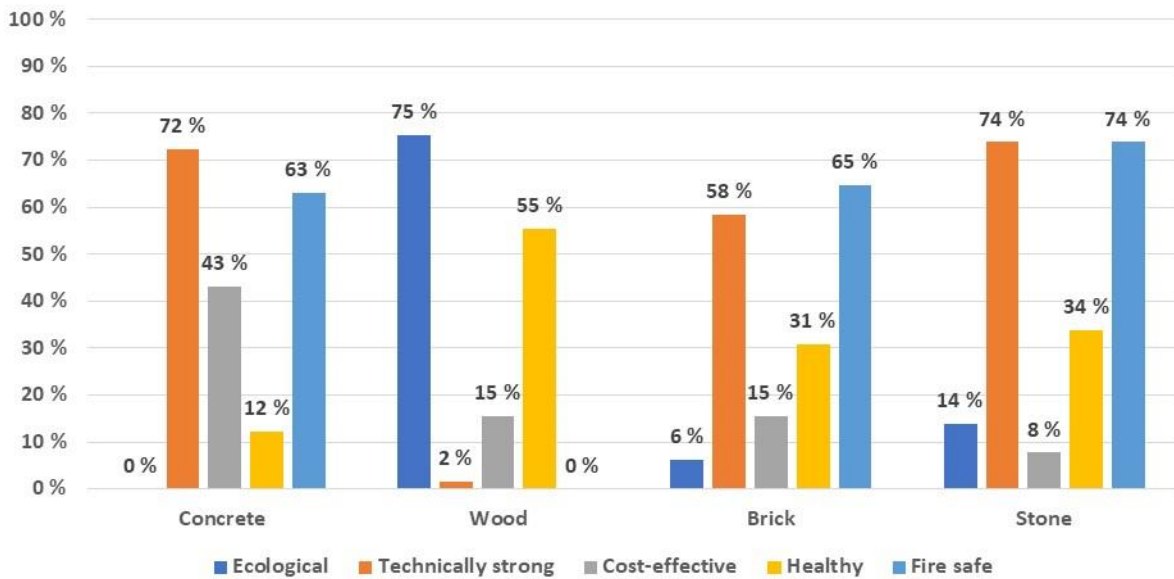


Figure 7. Customer perceptions of the properties of concrete, wood, brick and stone as structural material for houses (based on experiences and knowledge of real-estate agents).

As intermediaries between sellers and purchasers, real-estate agents are important information deliverers in the multi-storey housing markets. For example, in the context of wood construction, the individual experiences, knowledge and perceptions of the real-estate agents may affect how they interpret the views of consumers on different structural materials. To gain information on this potential impact in the analysis, also real-estate agents' own perceptions of the properties of different structural materials were inquired in the survey. According to the results, some differences were depicted between the personal views of the real-estate agents and their views on how consumers perceive different materials. However, statistically significant differences between the own opinions of the real-estate agents and their perceptions on the views of home purchasers were not identified.

On average, real-estate agents perceived all materials to be more ecological, but also healthier than consumers. The real-estate agents also thought brick to be more fire safe and stone more cost-effective compared to consumers. Regarding wood as structural material, real-estate agents perceived it slightly more technically strong and fire safe than what they thought to be the perceptions of the home purchasers. In addition, compared to what real-estate agents considered as the opinion of home purchasers, the real-estate agents emphasized more the

cost-efficiency of the concrete as a structural building material and less its technological solidity¹.

The results on the views of consumers and real-estate agents on the properties of wood in MSC structures are in line with previous studies. For example, according to Larasatie *et al.* (2018), uncertainty and suspicion on fire safety of wood exist among consumers. However, in the study of homeowners Viholainen *et al.* (2020) showed that fire safety was perceived as a risk, but at the same time homeowners recognized that fire risks are also connected to other structural materials. Thus, prejudices against wooden structures are not always unambiguous. According to Lähtinen *et al.* (2019) consumers could benefit, for example, from practical examples on fire safety aspects of the buildings (e.g., main causes for fires at homes or behaviour of timber structures compared to structures made of other materials). Regarding the role of branding of wooden urban housing, in Norway Høibø *et al.* (2015) found that younger people with environmental values could be potential targets for housing in the wooden MSC. The same study also revealed that for people with high concern about durability, their preferences for wood as structural material increased with increasing knowledge on wood.

The results on the real-estate agents of this study also comes down to how to raise general awareness on wood as a building material, which is still limited and controversial also among professionals: For example, architects in North America perceived wood as a construction material contributing more positive to health aspects such as human stress and indoor air quality compared to e.g., concrete (Conroy *et al.*, 2019), but they still ranked within the same data health as the least important aspect in advantages of using structural and non-structural wood products (Conroy *et al.*, 2018).

In relation to the quantitative and qualitative results of this study, perceptions (both consumers and real-estate agents) have some insights. First, the usage of wood in multi-storey buildings is a relatively new phenomenon, and thus uptake of new materials and building technologies may be perceived as an additional financial risk among future homeowners. Second, as a result of the novelty, although real-estate agents have positive attitudes towards

¹ More detailed descriptions of real-estate agents' perceptions of different materials' properties from authors upon request.

the environmental friendliness and healthiness of wood in building, they simultaneously seem to lack cognizance on the technological properties of wood (i.e., technological solidity and fire resistance of wooden structures). This affects their possibilities to act as knowledgeable informants on the MSC despite the fact of majority of the detached houses, row houses and two-storey apartment houses being built with wooden structures in Finland (Jussila and Lähtinen, 2020).

In addition, from the perspective of Finnish housing markets in general, there are doubts on technological solidity or fire resistance of the wooden structures. These may be especially important in Finland, where problems with the indoor air quality of caused by poor design, building defects, and bad maintenance (Chelelgo *et al.*, 2001) combined with problems especially related to concrete building technologies have gained emphasis especially in the recent years (Sekki *et al.*, 2021). Thus, although the problems with building defects have not been related to the wooden MSC, for home purchasers any doubts on the technical quality of the buildings may be a severe issue affecting their willingness to buy homes in the multi-storey housing companies built with wood.

Authors emphasize the importance of communication both as a way to enhance the knowledge on the properties of wood (i.e., acceptability, perceived risk among future homeowners) and to promote the benefits of wood in the building structures (i.e., desirability, perceived value of living in a multi-storey house built with wood). Thus, communication could reflect in the competitiveness and profitability of the MSC businesses by better consideration of the differing housing value expectations among different types of home purchasers. For instance, according to Kärnä (2004), more profound collaboration with consumers at the phase of building enhances the satisfaction and perceived quality of the buildings among homeowners.

Lastly, based on the findings of this and previous studies, the first option of branding in wooden MSC could be based, for example, on the tangible material properties (e.g., perceived benefits of wood for humans and environment) (e.g., Franzitta *et al.*, 2011) or consumer-driven design of floor plans (e.g., Gijsbers and Lichtenberg, 2014) enabled by modular prefabrication (e.g., Schneider and Till, 2005). The second option could be grounded, for example, on meeting the intangible self-identity expectations of consumers by building houses with valued characteristics on locations that are in congruence with their lifestyles

(e.g., Hauge and Kolstad, 2007; Gibler and Tyvima, 2014). According to Després (1991), both material properties and societal contexts should be taken into account when addressing consumer perceptions and experiences on homes.

6. Conclusions

By employing real-estate agents as informants, this study focused on exploring consumer housing value expectations and branding possibilities in the Finnish multi-storey house markets paying a special attention on wood as a potential source of branding. As a simplified outcome of our analysis, branding opportunities seem to exist in the Finnish wooden MSC markets.

Despite the large proportion of housing companies in the Finnish MSC markets, the housing value expectations of homeowners in those houses have been rarely studied. Especially better consideration of value expectations of consumers on the other housing attributes than the ones connected directly to the properties of apartments (e.g., cladding materials) can lead to entirely new differentiation possibilities for the wooden MSC businesses. In general, most of the real-estate agents in our survey data had observed branding opportunities in the MSC, although more sceptic views were presented. It was suggested by several respondents that the future homeowner could be involved in the planning at one or different stages of the construction process, thus expanding the business ecosystem element with active resident inclusion.

In the Finnish MSC markets, consumers have already nowadays possibilities to affect the interiors of the newly built apartments, which does not give much space for differentiation between different construction businesses. Compared to this, seeking for genuinely new practices through business ecosystem thinking could be a source of a new type of competitiveness for wooden MSC businesses compared to companies following the traditional business regimes. For example, it would be possible to integrate future homeowners in the architectural design processes already at earlier building phases by utilizing tools such as virtual building information modelling systems. More profound integration of home purchasers in the building design processes could both increase the

potential for branding in the wooden MSC, enhance communication possibilities to enhance trust among actors, and add knowledge on the usage of wood in the MSC.

Branding in the MSC housing markets can be considered as a hierarchical construct, in which location is of a fundamental importance. Branding efforts in the locations, which are not perceived as pleasant from the perspective of future homeowners, may be waste of efforts. However, like the attractiveness of a specific multi-storey house, also the attractiveness of the location is affected by several individual factors (e.g., family structure, lifestyle, image in the eyes of the others). Thus, branding in the wooden MSC would require understanding on how the target buyer segments value different types of locations, building properties and dwellings, and how what type of differentiation could enhance competitiveness of the businesses. In addition, our results provide indirect evidence that through better communication on the properties of wood (i.e. wood was perceived very differently compared to other structural materials among consumers based on the perceptions of real-estate agents) in MSC would be very important from the perspective of acceptability and desirability of wood in the eyes of consumers.

Due to the exploratory nature of the study, it should be noted that the results offer only preliminary perspectives on the subject under study. Nevertheless, findings call for wider understanding of the business ecosystems and roles of different actors in them especially regarding sustainable housing solutions. This could be implemented, for example, by exploring the business network and ecosystem of a particular wooden MSC project in more depth to gather information on how building design processes could be reorganized and communication between different actors enhanced to support co-creation of value with consumers, accumulation of knowledge within the business ecosystems, and development of trust between builders and home purchasers. In addition, it would be valuable to understand how the home purchasing process (e.g., the importance of the specific housing value attributes) proceeded in the case of a specific wooden MSC project. For businesses building houses with good architectural built in pleasant milieus and good locations, differentiation and branding could be a source of competitiveness, if the prejudices against the technological properties of wood in the MSC were diminished.

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Appendix 1. Descriptive statistics of the statements measuring the significance of the housing value creation attributes in the multi-storey housing.

LOCATION	Mean	Standard deviation	Variance	Skewness	Kurtosis
The apartment is located in an important environment for the client, be it the city center, the proximity of the city center, the suburbs, the agglomeration, the rural area or the countryside	4.28	0.65	0.42	-0.34	-0.68
The apartment is within walking or cycling distance of everyday services depending on the needs of the customers, e.g. kindergartens, schools, study and workplaces	4.02	0.70	0.48	-0.88	1.84
The apartment is within walking or cycling distance of leisure services, e.g. restaurant, sports and cultural services	3.22	0.91	0.83	-0.58	0.57
The apartment is close to good public transport connections, depending on everyday services, e.g. kindergartens, schools, study and workplaces	3.88	0.80	0.64	-1.09	2.25
The apartment is close to good public transport connections for leisure services, e.g. restaurant, sports and cultural services	3.40	0.84	0.71	-0.40	0.04
The apartment is well connected for private cars' use for everyday services depending on the needs of the customers, e.g. kindergartens, schools, study and workplaces	3.49	0.83	0.69	-0.31	-0.50
The apartment is well connected for private cars' use for leisure services, e.g. restaurant, sports and cultural services	3.15	0.87	0.76	-0.01	-0.41

RESIDENTIAL AREA	Mean	Standard deviation	Variance	Skewness	Kurtosis
The residential area is safe, e.g. isn't known for its disturbances	4.46	0.61	0.38	-1.10	2.33
The residential area is quiet, e.g. there is no noise caused by traffic in the residential area	3.77	0.70	0.49	-0.20	0.01
The residential area is designed so that it offers privacy e.g. window and balcony views as well as space in the courtyards	3.86	0.77	0.59	-0.18	-0.39
The residential area has a good image, e.g. profiled by urban planning, services or the existing housing stock to be inhabited by certain types of people	3.74	0.87	0.76	-0.48	-0.28
The residential area is known for its communality, e.g. good opportunities to establish relations with neighbors and the local community	2.48	0.92	0.85	0.13	-0.19
The age structure of the residential area is uniform	2.12	0.84	0.70	0.25	-0.60

HOUSING	Mean	Standard deviation	Variance	Skewness	Kurtosis
There are good opportunities for parking and storage of cars in the yard of the residential building, e.g. parking lots, carports, parking garages	4.45	0.59	0.34	-0.50	-0.64
The residential building has common areas (promoting community), e.g. the housing company's common sauna, club or hobby facilities	2.58	0.93	0.87	-0.02	-0.30
The residential building promotes the implementation of sustainable housing solutions, e.g. the use of smart technologies in the home or the possibility of their introduction, solar panels, the possibility of charging electric car batteries	2.71	0.90	0.80	0.22	0.19
The residential building has pleasant and safe courtyards for residents of all ages	3.18	0.92	0.84	-0.13	-0.19

BUILDING	Mean	Standard deviation	Variance	Skewness	Kurtosis
The building is safe in its solutions, e.g. choices related to frame structures and technical systems increase the feeling of security	3.09	1.13	1.27	-0.19	-0.73
Attention has been paid to accessibility and easy movement in the building, e.g. adequate corridor space, elevator	3.52	1.02	1.03	-0.39	-0.27
The choice of building frame materials corresponds to the concept of quality construction, e.g. a concrete, brick or wood frame is justified for reasons understandable to the buyer	3.25	1.15	1.31	-0.38	-0.56
The choice of building cladding materials corresponds to the concept of high-quality construction, e.g. wood or brick cladding is justified for reasons understandable to the buyer	3.15	1.08	1.16	-0.08	-0.59
The environmental impact of the building is as small as possible, e.g. the choice of materials and building technology promote resource efficiency	2.54	1.02	1.03	0.40	-0.38
The architecture of the building is of high quality, e.g. insightful visual solutions	3.18	1.04	1.09	-0.04	-0.90
The building offers experiences, e.g. design, material choices, stairwell solutions are pleasant	2.88	1.10	1.20	0.03	-0.44
The building is new or completed in this decade, reducing e.g. expected repairs	3.89	0.81	0.66	-0.16	-0.71

APARTMENT	Mean	Standard deviation	Variance	Skewness	Kurtosis
The apartment is spacious and has plenty of living space, e.g. to prepare for changing needs	3.23	0.77	0.59	0,22	-0.20
The apartment is of sufficient size and does not have "unnecessary" living space, e.g. changing space needs are not considered at the time of purchase	3.85	0.69	0.48	-0.38	0.41
The apartment has a sauna	3.05	0.84	0.70	-0.42	-0.66
The apartment is reasonably priced, e.g., not significantly above or below the planned budget	4.46	0.59	0.35	-0.56	-0.60
The apartment is good as a financial investment, e.g. the preservation of the resale value	3.97	0.75	0.56	-0.41	0.04
The maintenance costs of the home are reasonable, e.g. building technology promotes energy efficiency	3.97	0.66	0.44	-0.64	1.40
The apartment is in a financially stable and well-managed housing company, e.g. the activities of the board and property management are consistent	3.85	0.83	0.69	-0.37	-0.32
The apartment is in a housing company that buys management and maintenance services from a good external service provider, promoting e.g. ease of living	3.55	1.02	1.03	-0.38	-0.23