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SINGLE REAL ESTATE DEVELOPERS' INNOVATIONS IN HOUSING DESIGN: AN HISTORICAL EXPLORATION BASED ON CHINA VANKE CO. LTD.

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Abstract. This paper focuses on the practices, innovations and design regarding housing supply developed by a single Chinese private real estate company, China Vanke Co. Ltd. between 1979 and 2016. In the last 5 decades, China experienced a period of rapid urbanization, accompanied by the introduction of numerous economic and institutional reforms impacting the nation's model of housing supply. Significant changes disrupted the urban housing sector in the country, shifting the main supply system from a public welfare model to a market-driven one. Within this time span, most new residential properties were developed and marketed by large real estate enterprises, which became crucial players in establishing the new housing market. While there is an extensive body of literature examining China's housing market formation and progression, most of these studies focus on the economic and social aspects of housing, including factors such as affordability, inequality, governance, preferences and choices. Single real estate firms' innovations, as well as the links between housing designs and market supply and demand, have yet to be thoroughly explored. This latter area represents thus the main focus of this paper. Expanding from the specific case of Vanke, this paper seeks to discuss the innovative processes of a real estate enterprise and the role of a single company in shaping new housing designs, based on supply and demand transformations.

Keywords: housing, China, innovation, design, real estate.

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1. Introduction

Since 1979, post-Mao economic reforms have brought significant changes to the urban housing supply in China. Many institutional reforms were introduced by the central government into the re-establishment of an urban housing market that rapidly replaced the previous urban housing supply based on work units' allocation through the welfare system. Many scholars, especially economists, planners, urban theorists and geographers, have focused on these reforms as well as on the various performance dimensions of the Chinese housing market in terms of affordability, inequality, governance or preferences and choices (e.g., Chen & Han, 2014; Liang et al., 2016; Wu, 2015). Less is known about these houses' physical attributes and their designs in relation to both the market conditions and the industry that financed and managed their production. Moreover, even if many of these studies provide important insights about macro changes in China's housing system and market, there exists a lack of research at the micro level concerning real estate enterprises that may have pushed and influenced such a transformation. Very few scholars, indeed, have focused on China Vanke Co. Ltd., Poly Real Estate, Country Garden, or similar large real estate groups. Table 1 highlights that these are powerful organizations, most of which became entrenched during the early stages of market formation in China. Hence, it should be questioned whether the particularities and histories of those firms influenced the industry more broadly and consequently the products (housing projects in this case) and services they injected into the market.

This question is not new in the field of economic and technology studies. The role of a single entrepreneur (or a firm) in bringing innovations and changes into a market has generally been at the center of evolutionary economics theories (e.g., Nelson, 1991; Nelson & Winter, 1982) and historical business studies (e.g., Chandler, 1990; Jones & Zeitlin, 2007). In the architecture and housing fields, this issue has not been considered extensively. Recalling Shumpeterian visions, this paper made use of a historically oriented case study approach to shed new light on this complex phenomenon.

The research presented in this paper is based on an historical analysis of one specific real estate company, namely China Vanke Co. Ltd., as well as an architectural and urban analysis applied to some of this firm's residential

Table 1. Top ten Chinese property firms by sales revenues in 2014 (Cao, 2015, p. 208)

	Company Foundation	Company Sales Volume (Billion RMB) in 2014
China Vanke	1984	174,06
Greenland Holding	1992	162,53
Wand Group	1998	130,11
Poly Real Estate Corp	1992	125,10
China Overseas Property	1986	117,00
Country Garden	1996	109,73
Evergrande Group	1996	108,25
China Resources Land	1994	68,10
Shimao Property	2001	67,07
Greentown China	1995	55,38

projects. Founded in Shenzhen Special Economic Zone in 1984, Vanke was one of the first companies to enter the housing industry and is currently the leading firm in the mainstream residential sector. Thus, drawing on an archival research on China Vanke and its production over the time, this paper aims to depict that housing development companies develop firm-specific factors and cannot be considered homogeneous groups that behave in the same way within the housing and land market. This fact, pointed out by some authors (e.g., Ball, 1999; Coiacetto, 2001) in reference to British housebuilders and the Australian industry, is worth discussion in the Chinese context.

A business history approach to the real estate industry also attempts to change some usual historical perspectives. Indeed, both architectural histories based on the ideas and practices of architects–as well as housing histories based on broader political, social, and economic forces (in China, see, e.g., Junhua et al., 2001)–tend to exclude a series of marketing and business strategies, procedures, and ideas that are crucial for characterizing housing projects and explaining their impact on the built environment's construction in a given context.

Indeed, while the role of real estate developers has rarely been investigated in housing studies and architectural histories in both the Chinese and Western contexts (cf. Stevens, 2016), this paper argues that China Vanke was an important agent that conditioned houses' conception, design, and management in China's post-reforms period. As the enterprise evolved, it expanded its business and consequently matured its organization. As it became more technically expert and more responsive to economic and consumer demand, I argue that it introduced new housing designs and other kinds of innovations into the Chinese housing market. I discuss how these innovations relate to one another as well as how they effectively influenced the final design of Vanke's houses. Subsequently, I also attempt to explain how the transformation of the company's projects and processes was often connected with strategic adjustments to outer-market conditions–e.g., political and social changes. Indeed, in pursuing such strategic developments, the company tended to expand and differentiate its catchment areas by accessing new sub-markets and providing new housing patterns for those markets. This fact introduced important changes into housing production and resulted in different forms of spatialization and design. In this sense, the focus on one single company attempts to demonstrate how market processes and house designs' spatial outcomes are not directly attributable to predictive broader logics; rather, single companies' investments in innovation must be taken into consideration. In other words, this paper aims at using Vanke's history to display the role of a single enterprise in shaping the industry, anticipating the market, and influencing new housing designs and business models.

In the next paragraph, I briefly review the international literature on innovations and developers' individuality in the housing market. Subsequently, I introduce Chandler's concept of "dynamic firm," and I acknowledge how this perspective could be reasonably applied to real estate firms, such as Vanke. Finally, I discuss Vanke's innovative processes from 1988 to 2016, showing how different kinds of innovations were often related to others as well as to external market transformations and how they influenced Vanke's housing designs. Thereafter, the discussion of Vanke's innovations displays how the company accessed new markets and thus retained a competitive edge over its competitors.

2. Innovation and real estate firms' role in the housing market: a literature review

The themes of housebuilding and house design innovation have been at the center of the academic debate in several contexts (for a comprehensive review, see Fairweather et al., 2009). Almost one hundred years ago, some academics, such as Albert Farwell Bemis, a professor of Architecture at MIT, considered the correlation between housing sector innovations and housing design. In his masterpiece, *The Evolving House*, Bemis (1936) distinguished between innovations that are exploited in the construction of houses and direct innovation in the house building and real estate sector. The latter, he recognized, "remained a backward sector, dominated by small firms and 'craft' methods of production and unable to exploit the benefits of standardization and scale in terms of quality and price" (as cited in Putnam, 2004). More recently, Hooper and Nicol (1999, 2000), focusing on the design practices of large-scale developers in Britain, confirm a similar thesis, stating that innovation in the housing industry is many times more associated with "downstream suppliers" than with innovation in the construction and design process itself. Hooper and Nicol were part of a much broader class of scholars who focused on innovation in the homebuilding firms in Britain between the end of the 1990s and the early 2000s (e.g., Barlow, 1999; Barlow & Ozaki, 2005).

However, compared with dominant studies that considered the housebuilding market as a whole and thus focused on the general market conditions in which firms operate (see, e.g., Gibb, 1999; Nicol & Hooper, 1999), the innovation efforts of specific real estate enterprises have been relatively under-researched. Ball (1999) was one of the first academics who recognized firms' specific responses to market transformations. Later on, in the United States, Fainstein's (2001) seminal work, *The City Builders*, more broadly cautioned the academic world about the key role of developers in featuring urban spaces and architectural designs. A similar position has also been researched and further developed in Australia, where Coiacetto (2001) analyzed and reviewed the literature about developers' behaviors and their implications for the built environment. More broadly, Coiacetto (2012) highlighted the gap between the influence attributed to developers and the way in which they are academically explored. According to him, "Developers are acknowledged to be powerful and influential entrepreneurs but in the academic world their role has been overlooked and they have been often considered as a homogeneous group" (Coiacetto, 2012, p. 353).

Despite the recent fast-paced development of the real estate and housing industries in Asian countries, particularly in China, the topic of innovation in those sectors is only partially explored (Yusof & Shafiei, 2011). Particularly, given the particular relevance of sustainable development in contemporary China, many studies on Chinese real estate and China's construction industry–some of them employing China Vanke as a principal subject of investigation–have examined innovation with a particular focus on green strategies and technologies (e.g., Wang, 2014; Zhu & Lin, 2004) and off-site prefabricated construction techniques (e.g., Zhai et al., 2014; Zhang & Skitmore, 2012). However, all these researchers provide approaches and findings pragmatically directed to practitioners in the local construction industry, and hardly relevant in other contexts or broader theoretical and architectural considerations.

Even though many of these studies established an important background for this research–having underlined the main topics that characterized innovations in real estate and in construction industries in different contexts; having shown the importance of focusing on single real estate firms; and having already provided some specific insights on innovations in China through the analysis of Vanke–the relationship between a firm's innovation processes and housing design production in the emerging Chinese market still requires investigation.

3. Theoretical framework: a dynamic perspective on a real estate company

The previous literature clearly acknowledged the importance of investigating the role and the behavior of single real estate firms in housing design and innovation. Accordingly, what I am bringing to the discussion in this paper is that the novelties and changes in the housing design

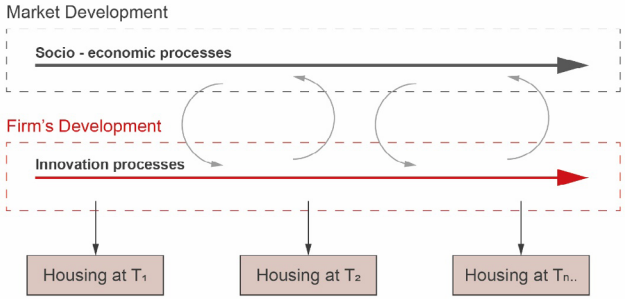

Figure 1. Diagrams explaining a framework for understanding housing outcomes according to both market and single firms' developments

spheres are neither merely ascribable to macro-external conditions nor solely to architects' inventions; rather, they are strongly related to single real estate firms' internal innovation processes (Figure 1).

Through the lens of an already established tradition in the economic field, this places the "entrepreneur" at the center of the housing and architectural debate and thus highlights "innovation as the specific instrument of entrepreneurship" (Drucker, 1985, p. 30). In other words, this is a way to overcome the limits of many international studies on the Chinese housing and real estate industry, which emphasize the market context in which firms operate (e.g., Fung et al., 2010; Wang, 2001; Wu et al., 2007), adopting a perspective that considers the internal processes and strategies of real estate firms as relevant agents in the restitution of housing explanatory causes. Indeed, Chinese real estate developers have too often been treated as a homogeneous group that operate in the housing industry only in economic terms. In contrast, my viewpoint suggests that real estate companies can respond differently to existing market contexts in terms of design, technology, and innovation.

More precisely, following Alfred D. Chandler's studies on dynamic firms (Chandler, 1990, 2005) the historical perspective on Vanke, adopted in this essay, shows that, thanks to its dynamic attitude, even a real estate firm–and particularly a large group such as Vanke–is able to respond creatively to changes in the Chinese market environment. In turn, these industrial but also creative processes are able to generate innovations, which enable a company such as Vanke to inject new houses and management services into the market according to the inhabitants' needs (Amatori & Jones, 2003, p. 16).

Moreover, an overview of firms' dynamics could help to provide an understanding of housing technology and design changes–at a firm level–as processes of growth, which are driven both by a firm's interim processes and local market transformations (Chandler, 2005). In this sense, I aim to move beyond the body of literature that is overly focused on broader socio-economic factors and instead focus on single firms' strategies and design issues. Thus, the purpose of this study is to enhance the role of single real estate firms, together with their business networks,

in developing innovative housing solutions that can easily respond to socio-economic and political transformations.

Finally, the historical analysis of Vanke, and particularly of some of its narratives, shows that innovation in the housing development sphere has been claimed by some Chinese developers themselves as a relevant subject of interest because it could provide a company with an advantage over its competitors. Through this lens, even design and architectural novelties assume a different role and meaning. From this industrial perspective, housing design has to be re-interpreted as "the process resulting in a marketable product" (König, 2013), and since these innovative projects aim at being highly differentiated, they can be successfully branded.

More specifically, the next paragraph discusses how, by transforming technological and/or market conditions, Vanke might be able to differentiate itself from other firms in the industry and gain a sustained competitive advantage. In this regard, "innovations require learning about how to transform technologies and access markets in the ways that generate higher quality, lower cost products" (Lazonick, 2006). This perspective of Vanke as an "innovating firm" (Lazonick, 2013) thus aims at enhancing the role of a firm's innovative processes, not only in sustaining economic growth but also in developing and transforming housing patterns within the Chinese housing industry. In other words, firms' innovation processes can become another way to explain and recognize broader design changes in the real estate and commercial housing sphere.

4. Vanke's housing designs from the perspective of an innovative enterprise

Previous studies acknowledge that, within the residential development industry, most discussions on innovation mainly focus on homebuilding firms, as "the builder makes key decisions about systems and products, as well as about assembly" (Koebel, 2008). Nevertheless, China's market structural conditions are slightly different. Firstly, Chinese housing market is newly emerging, as are the property developers that act in the industry. The market has experienced an incredibly fast-paced transformation, mainly driven by different stages of state intervention (Wu, 2015), which gives the Chinese market its own particular history and features. Secondly, it has been previously acknowledged in the existing literature (Cao, 2015, p. 208) that this market recently shifted toward a concentration of large corporations, such as Vanke, which hire building companies for construction works. Subsequently, as those real estate firms control a large portion of housing production, management, and financing, they are also the firms that possess the capital and human resources to be relevant in the promotion and diffusion of innovations on a broader scale, thus probably making a large group, such as Vanke, a partially unique and strongly contemporary phenomenon. In this context, real estate developers, more than any other firms, are able to set the design characteristics of the housing supply on the basis of market demands, as well as they could be able to generate and

Table 2. Resume of main Vanke's innovations during the years

Year	Type of innovations				
	Product/services	Production method	Source of supply	Business model	New markets
1991	Homeowner committee			Comprehensive trading Company	*High-End People* (*Luxury market*)
1994				Management of properties built by other developers	
1998	Customer Club				
1999			C.P.D. System		
2001				Solely Residential Developer	*"Ordinary People* (*Mass market*)
2003	Scenic Houses			Fully Furnished Houses	
2004			Overseas Financing Platform		
2005	V Houses (Small apartments)		Land through Firms' Acquisition		*Mid/Low-Income Citizen*
2006		Housing Industrialization			
2007	6+2 CRM		Standard Rating System		*Green Market*
2010	Youth Group Houses (very small apartments)				
2011					
2012				Long Rental Apartments	*Young Migrants*
2014				Urban Service Provider	

convey new market demands. Large real estate groups, such as general contractors and builders in other contexts, play thus a mediator role in the interface between the organizations, which develop many of the new products and processes–such as materials and equipment producers, design consultants and trade contractors–and those which set the demands for these innovations–such as home buyers, policy makers and other industrial institutions (Winch, 1998). However, in the Chinese context, since the developers and builders are not the same entity, the types of innovations that they are involved with should also vary, this respect to literatures which examined the relationship between innovation in the construction industries and design issues. Subsequently, the innovative efforts of a single firm (Vanke in this case) can help us to understand that innovation "does not have to be technical, does not indeed have to be a thing altogether" (Drucker, 1985, p. 31), and a broader range of practices should be accounted as innovations. In this sense, housing design innovations are not merely ascribable to inventions and ideas from the sphere of design and architecture (and so the architects' practices). Instead, they may influence–or they may be influenced by–other kinds of innovations, such as new methods of production, new sources of supply, new ways to organize business (business model innovation today), and the exploitation of new markets (see Table 2). This Shumpeterian classification is also the basis for the following discussion.

4.1. Improving after sale services

Vanke's innovation journey started in the property management and service sector. In 1991, the company introduced China the first "homeowner committee" in China (Wang, 2011), which gave rise to a new property management model of combining the autonomy of home-owners with professional service. To some extent, the establishment of the first homeowner committee by Vanke should be considered as a disruptive innovation since this new practice partially reshaped the industry, along with the Chinese city and society. The Home-Owner Association (HOA), introduced by Vanke, was later included and formalized in the first Housing Management Regulation issued by the Municipal Government of Shenzhen in 1994 (Wang, 2011; Yang, 2014), and this emerging practice surely contributed to city service privatization in China and the retreat of the state in urban governance. As usually happens with disruptive innovations, the novelties in property management introduced by Vanke led to the frenetic expansion of the firm and a subsequent period during which many incremental innovations were conceived under the new dominant field of innovation (Koebel, 2008). Indeed, some years later, Vanke became the first property management company in China to be internationally certified as ISO9002 as well as the first firm to manage properties created by other developers (Xu, 1997). Subsequently, in 1998, Vanke introduced the first "Customer Club" in the People Republic of China, which provides an innovative virtual form of communication between the company and its' properties inhabitants. Lastly, in the earliest phase of its career, Vanke would be committed to strength its development in the areas in the areas of Hospitality, Retail, Office complexes, Commercial Properties, Medical and pensions in addition to its traditional residential business (Vanke Guangzhou Branch, 2017). In a press release, dated to 2013, Mao Daqing, Executive Vice President of Vanke, revealed the new firm's business strategy "being a comprehensive urban service provider" (Mao, 2013).

All previous cited events made Vanke quite different from other developers in China, because the broader success of the company was both initially and latterly based on the management and service provision of the properties it built. However, Vanke's efforts in property management innovations have also had a broader influence on the definition of the Chinese City and its housing forms during the period of market formation in China. Indeed, since Vanke and other property developers adopted exclusive and innovative urban services to market their estates (Wu, 2004), especially in the suburbs, this strategy became crucial for gaining a competitive advantage on the real estate industry. At the same time, since this provision of services from private organizations was economically efficient, municipal governments strongly supported this practice, as it contributed to a reduction of public responsibilities and administrative costs (Zhang, 2002). Consequently, property management and development companies, such as Vanke, started to provide a variety of basic infrastructures and urban services that were typically the responsibility of local governments inside their estates, which is likely one of the main reasons for the dominance of super-blocks and

Figure 2. Application of standards elements of the patent "Very Small Apartment" to the project of Guangzhou Vanke Cloud City

master planned communities in Chinese cities (Hendrikx & Wissink, 2017). In this regard, both early large housing estates developed by Vanke during the 1990s, such as Shanghai Vanke City Garden and Vanke Wonderland in Shenzhen, and more recent large-scale master-planned communities, such Vanke Liangzhu Cultural Village, are paradigmatic examples. The Vanke City Garden, for instance, was the first prototype full-service housing community that suddenly became immensely popular among middle class homebuyers and since then it has been replicated in many other developments around China (Figure 2).

4.2. Products innovation

In the early 2000, Vanke began to develop professionalization in the housing development sector and the company established the Vanke Architectural Research and Development Center (Vanke Annual Report, 1999, p. 22), the first of this kind in the People Republic of China (Xiao & Zhu, 2003). While Vanke's operational and geographical scale was rapidly rising, the firm was facing a new market (the mass market) and had to expand its housing portfolio as well. Thus, many times Vanke claimed products innovations, which have occurred with the appearance of new sets of housing solutions. For instance, the estate of Vanke Wonderland in Shenzhen was one of the first gated communities in China to stress the design concept of "new urbanism", which led the community to win the prestigious "China's Harmonious Living Innovation Award" issued by the Chinese Ministry of Construction (Chen, 2001). Another exemplary case is the V Garden project (Figure 3) in Shenzhen. Its design concept of the "Original Modern Chinese-style Residential Property had gained wide recognition from customers and the market" (Vanke Annual Report, 2005, p. 42), particularly as it questioned not only stylistic features but also the density of the urban structure in the Chinese metropolis (Wang & Zhao, 2006; Zhu, 2006).

Innovative design solutions were promoted and provided on specific projects through the involvement of an increasing numbers of architectural graduates that, "many times excluded from the design process, were joining developers to become client-side designers" (Zhang, 2019). As noted by Jenkins and McLachlan (2010), this provided architects, who are often considered by developers as inefficient and expensive, with an important role in the mainstream housing sector, particularly when innovation is required for differentiation. However, this highlights another relevant purpose of a real estate developer, such as Vanke. Due to their financial and managerial resources, they are prominent agents that permit architects' design inventions to be first realized and subsequently repeated and commercialized on a larger scale.

Indeed, based on successful practices, Vanke's research team internally developed several types of housing solutions, which have been patented under the company's name. These housing solutions, which included Scenic Houses (Vanke Architectural Research Center, 2002), Small Apartments (China Vanke Co. Ltd., 2010), Very Small Apartments (China Vanke Co. Ltd., 2011), have been applied to several of Vanke's projects. For instance, the patent of "Scenic Houses" and "Compound Residential Building", both of which applied to the Vanke Blue Mountain project in Guangzhou (Figure 3), have been later proposed for use in several other designs. The same is valid of the patent "Very Small Apartments", which after some years of research and development, have been applied, for example, in the project of Guangzhou Vanke Cloud City (Figure 4).

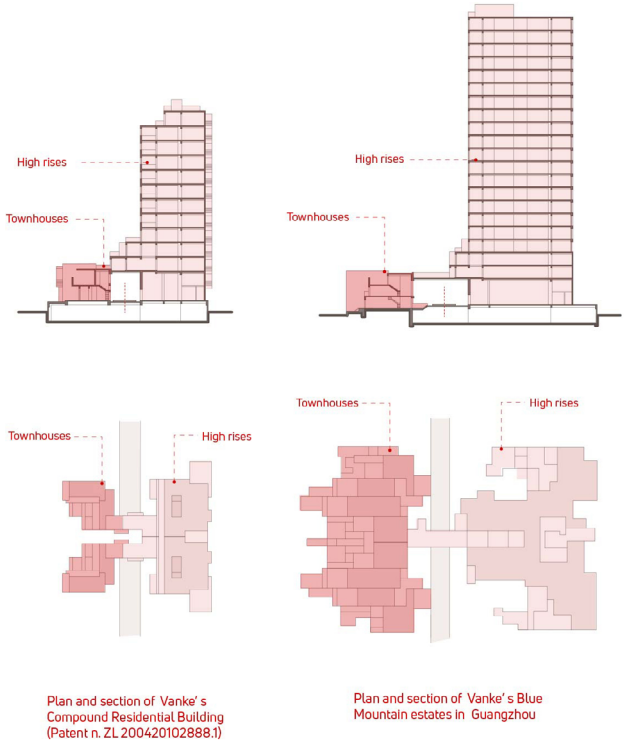

Figure 3. Application of standards elements of the patents "Scenic Houses" and "Compound Residential Building" to the project of Guangzhou Vanke Blue Mountain

Figure 4. Application of standards elements of the patent "Very Small Apartment" to the project of Guangzhou Vanke Cloud City

4.3. Innovating supply chains

Following the definition of Harty (2004), Vanke's new designs are a good example of how housing innovations are often "unbounded," which means that "their effects of implementation spill over beyond a single, coherent sphere of influence, and the collaboration of many firms is required for successful implementation." Indeed, in order to support project differentiation, a company is required to manage a large number of supply chains, which also have to be strongly standardized and organized (Barlow & Ozaki, 2003). Innovations for modernizing and rationalizing its supply chains were therefore a prerequisite for Vanke to implement and upgrade the new set of houses it was offering. Some process and business innovations would have gone under that way. First, in order to improve the efficiency of operations, Vanke developed a new E-Commerce procurement platform in 2001–the Vanke Joint Development Center –which, being the first of this type, rapidly became the unified procurement system for the People's Republic of China (Shan, 2000; Wang, 2001). Second, Vanke also innovated its procedure for supplier selection. Since Vanke capitalized its learning capabilities, the firm's technical know-how has been translated into a series of strict internal standards, which were used to select Vanke's qualified suppliers (Xie at al., 2016). In this way, Vanke's experience associated with its standardization efforts resulted in an effective innovation in process management, which was formalized in 2007 as Vanke's "Meteorite Action." The new plan aimed to increase the quality of Vanke's housing projects by developing an efficient system of quality management, which relied, at least in its earliest phase, on the selection of qualified suppliers that were able to adhere to Vanke's strict internal standards.

4.4. Innovating business models

During the early 2000s, in order to exploit new market areas, Vanke innovated also its business and marketing model, shifting from a project-oriented operation system to a customer value-oriented one (Vanke Annual Report, 2005, p. 8). Along this same line, the company started to manage its designs based on its customers' different stages of life and characteristics. In 2005, Vanke developed and implemented its own Customer Relationship Management (CRM) system exclusively fitted for its property business, which was the first of its type in China (Vanke Annual Report, 2005, p. 35). Later, in 2011, Vanke's CRM was formalized as the "6+2 CRM", and it was officially registered by the National Copyright Administration (Vanke, 2014, p. 26). Such innovative stances brought to another prodigious innovation in Vanke's business model and product offerings. In the mid of the 2000s, differently from many other Chinese developers, Vanke began to provide wholly finished houses instead of rough units (Zhang & Alon, 2010, p. 121). This innovation was then largely accepted by the housing industry, and many other developers started to adopt the same method (Jia et al., 2015, p. 172). By changing its business model in this way, Vanke was able to increase the quality of its housing offerings, sell them at a lower price, and achieve larger profits on every sold unit. Indeed, Vanke's offering of fully decorated units reflects two notions, which, according to Lim and Ofori (2007), are useful "to evaluate newness in most industrial contexts: it provided the company with differentiation, and it enhanced its competitive advantage."

Moreover, Vanke's commitment to selling fully and finely decorated houses is another example of the interrelation between business model innovations, process innovations, and their influence on housing design. The innovation urged the company to develop new supply processes as well as to improve the standardization of its products and procedures. In 2003, Vanke developed internal standards to define the main characteristics and parameters of its housing production (Chu, 2007). Later, in 2012, the company published a set of "Grading Standards for a Healthy Housing System," which established Vanke's standards for interiors and decorations (Vanke Annual Report, 2014). From an architectural perspective, this forced apartment designs and their dimensions to be conceived and fitted not only on the basis of customers' needs and structural constraints but also in relation to defined furniture and decorations (Lu, 2016). For instance, the combination of apartments in Beijing Vanke Holiday Town exemplifies this stance (Figure 5). Later, this innovative business model drove Vanke to strengthen its collaborations with its partners and suppliers and thus to develop standards and innovations for several home appliances and decoration elements, such as universal serial bus (USB) plugs, sanitary appliances, air filters, and door opening technology using cell phones (Wang et al., 2007), which would later be exclusively adopted in its residential estates.

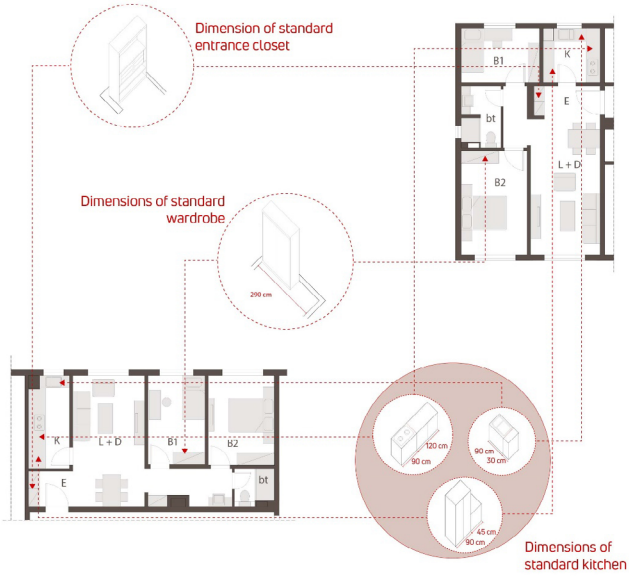

Figure 5. Influence of fully furnished houses strategy on houses design in Beijing Vanke Holiday Town

4.5. Innovating production methods

Thereafter, the history of Vanke depicts that the company was further committed to innovating its method of production over the years. Because Vanke's operations were rapidly growing at the national level, and given the advantages that it could obtain through the economy of scale, the organization started to develop new business strategies to improve the quality of its houses and reduce their costs. In the mid-2000s, Vanke invested substantial economic and human resources in research and development in the field of housing industrialization. The shift from on-site construction techniques to building with modular standardized elements, which could be made off-site, fundamentally changed housing production in the early 2000s, both for Vanke and other Chinese enterprises. As usual, disruptive innovations often involve multiple complementary innovations, which "involve improvement in existing products that have relative advantages over previous method in efficiency, performance or cost" (Fairweather et al., 2009). For example, Vanke started to patent single construction elements and other related technological novelties related to prefabrication housing development. However, the process of housing industrialization displays that it was difficult for Vanke to participate in the diffusion and development of innovation on its own. This highlights the fact that developers are usually involved in innovations that strictly require the participation of other stakeholders, such as suppliers, designers, planners, and even politicians. For example, Vanke's technological innovations, together with Vanke's standards, were approved by the Chinese government in March 2015, and since then, all prefabricated construction projects in the country have been required to meet the national standards on housing industrialization introduced by Vanke (Xie at al., 2016). This demonstrates how the legitimacy of housing industrialization, pioneered by Vanke, allowed the company to differentiate itself and gain a competitive edge in its industry. Moreover, through the concept of modular design, this type of innovation strongly influenced the design works in the projects where it has been adopted (Figure 6). Vanke's buildings and houses were then conceived as a whole based on modular forms (entire parts of buildings)–e.g., in the project of Vanke Holiday Town–or singular housing and landscape elements–e.g., the project of Guangzhou Vanke Cloud City, which can be easily fashioned in innovative ways.

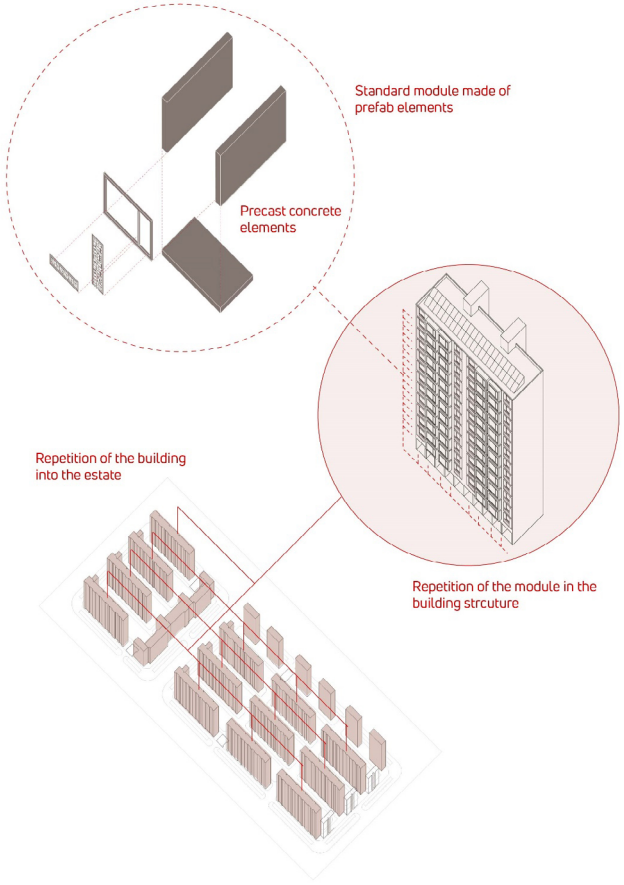

Figure 6. Influence of housing industrialization on houses design in the case of Beijing Vanke Holiday Town

4.6. Accessing new markets

To conclude, the history of Vanke and the analysis of its projects demonstrate how the company, thanks to its previously cited innovation processes, was able to access several new sub-markets during the China's post reform era.

Indeed, Vanke started its business with a major focus on the high-level consumer market, which required luxurious and fashionable products. On the one hand, the target was chosen by the company based on its internal capabilities; on the other hand, it was a general trend in the newly born Chinese residential real estate housing industry. During the 1990's, larger and more luxurious residential units (upwards of 160 m^2), featuring more complex spatial configurations and geometries, were favored by developers. Indeed, they maximized their profits by building very large apartments and thereby reducing design, construction, and sales costs (Cao, 2015, p. 84). Initial projects of the company, such as the Vanke City Garden series, clearly reflect this attitude (Figure 7). Vanke's production at the time was clearly lowered, and high profits were easier to achieve in the upper-luxury market, in part because of the high demand in this market niche.

Thereafter, after 1998, when market conditions started to change, Vanke significantly modified its strategy and focused its business on "houses for ordinary people" rather than targeting just the high end of the market. Indeed, in July 1998, the State Council enacted the Circular on Further Deepening of Urban Housing Reform (Cao, 2015, p. 87), which definitively abolished the welfare housing system allocation. In addition, the "financialization" of the Chinese housing sector had begun. Home mortgages became available for better-off households (Wang, 2001), significantly improving affordability for broader range of the Chinese urban population. As previously shown, Vanke made many innovations, both in its product offerings and

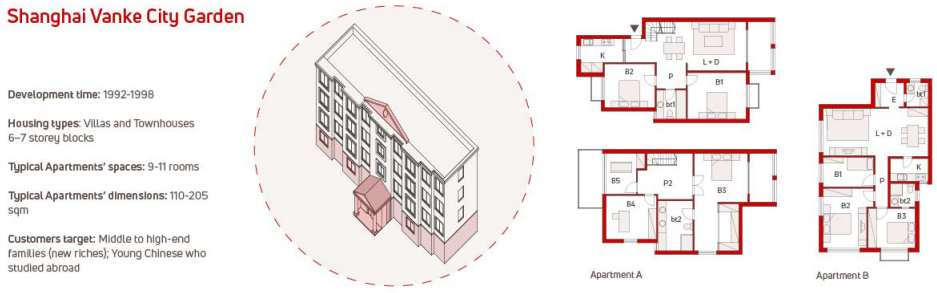

Figure 7. Resume of market and design features of Shanghai Vanke City Garden

business models–e.g., the Vanke Joint Procurement Development Center, the Vanke customer segmentation, and the Vanke CRM system, which supported the company's entry into the new market (the mass market). As consequence, some projects–such as Shenzhen Vanke Wonderland and Shenzhen Vanke Forest Hill, both of which took place from 1999 to 2003–reflect some paradigmatic changes in the structure and dimensions of new houses conceived for "ordinary people" (Figure 8). These new housing estates included a broader range of apartment sizes in order to accommodate the needs of families with different financial abilities. The smaller apartments had fewer bedrooms and, consequently, less space dedicated to distribution as well as minor rooms for extra services, such those dedicated to maids.

Some years later (during the mid-2000s), in order to adapt to the new macro-control measures imposed by the government as well as to promote its own brand image, Vanke shifted its housing offerings to lower-income people, designing smaller units that were already furnished and decorated–for instance the design features and dimensions of the houses in residential estates such as Vanke Holiday Town and Vanke King Metropolis (Figure 9). These new apartments, based on standard layouts, such as the patent of Vanke Small Apartment, were thus conceived to offer higher quality living environments to lower income social groups, exploiting the concepts of space saving and construction quality–made possible by Vanke's strategic moves in housing industrialization, fully furnished houses, and industrial quality control. In certain cases, the transformation was more radical, leading to changes in housing typology from houses dedicated to traditional family structures to ones accommodating young couples without any children.

Moreover, after some years of innovative processes–particularly in housing industrialization and the provision of fully furnished houses, Vanke was also one of the first developers to access the "green market" in China. In 2006, the company pioneered the market by developing the first three-star green certificated project in the country. In 2010, Vanke accounted for more than 50% of the three-star green projects in China (Jia et al., 2017). A good illustration of Vanke's emphasis on the green market is the Guangzhou Vanke Groove project (Figure 8). Moreover, thanks to technological improvements supported by its industrialization strategy and innovative quality control methods, Vanke was able to formulate its own technical standards for green building procurement, which were also used to set the national ones. Indeed, Vanke, similar to many other developers, recognized that such "green labels" differentiate its housing production and allow the company to charge higher prices for its units (Zheng et al., 2012).

Finally, according to Vanke Annual Report (2011, p. 2), the company also recognized that, during the second decade of the twenty-first century, young people comprised the mainstream floating population in first-tier Chinese cities. Among the new city migrants, the proportion of singles or young families with no children was increasing, thus suggesting an enormous market potential for ultra-small homes. Accordingly, Vanke completed research and development on ultra-small residential units with an area

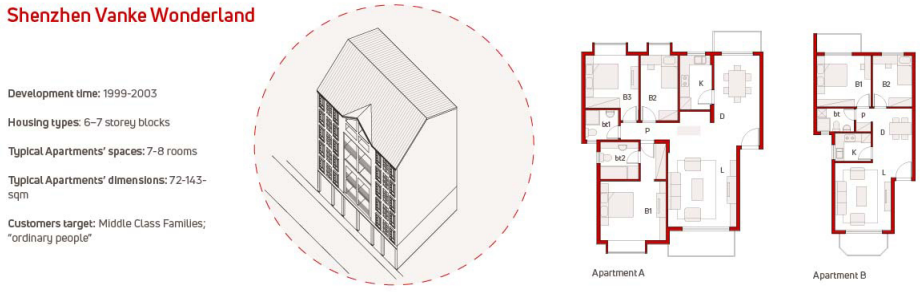

Figure 8. Resume of market and design features of Shenzhen Vanke Wonderland

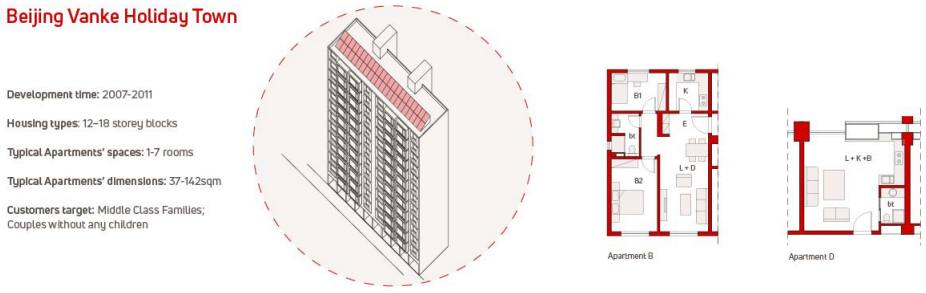

Figure 9. Resume of market and design features of Beijing Vanke Holiday Town

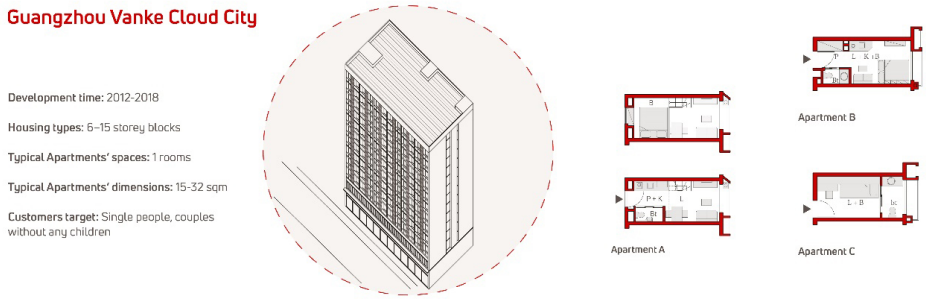

Figure 10. Resume of market and design features of Guangzhou Vanke Cloud City

less than 20 sqm (Refer to Patent Very Small Apartments) and commenced the construction of such new dwellings. An example of one such project is the Vanke Cloud City estate in Guangzhou (Figure 10).

This brief overview of how Vanke accessed new submarkets during the period of the Chinese market formation thus provides a way to understand how the design and the spatial configuration of these houses changed according to new demands, often based on socio-economic and political transformations, but also thanks to innovation processes advanced inside the organization. From this perspective, Vanke's transformation reflects an innovative firm that found a way to meet the new demands at this time thanks to considerable investments in innovation (Lazonick, 2006, 2013). Moreover, to some extent, Vanke's journey as an "innovative enterprise" can thus explain how the company made use of design and other types of innovations to develop higher quality products at lower costs, which became the basis for its well-established brand.

5. Conclusions

The analysis of Vanke's innovative efforts attempted to show that a single real estate firm played an intrinsic role in providing housing innovations and thus housing changes during the formation of the Chinese housing market. Unlike historical housing analyses based on macroeconomic and social changes, this paper highlighted that housing changes, in a given context, may vary based on the intentions and decision-making strategies adopted by a single real estate firm seeking to a gain a competitive advantage in the housing industry. This suggests that it is important to put more emphasis on the strategies and behaviors of private groups and organizations, how they interact within a certain political framework, and how they negotiate the construction of the built environment in a continuously unstable market. An individual company such as Vanke can be proactive or even visionary in terms of its strategic power in interpreting the market and providing new housing typologies.

Moreover, this essay examined Vanke's strategies, business models, and innovations and how they have occurred in different market seasons. While Vanke's innovations as well as its access to new markets provide insights into some paradigmatic changes in the company's house layouts and features, they could also be extended to the Chinese housing market as a whole. In this regard, this paper has shown that a historical view that considers the "dynamic attitude" of a real estate firm can increase our analytical perspective and add more variables to the way in which we understand and provide explanations for the physical forms of houses, their designs, and their positioning in a constantly changing market.

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