

25 Building Mass Customized Housing through Innovation in the Production System: Lessons from Japan

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Introduction

The housebuilding industry is often seen as different from other industries because it has failed to follow a conventional mass production model for economic development (Harris and Buzzelli, 2002, 2003). But this does not mean that the housebuilding industry in different countries is not well adapted to the local business environment. The differing conditions found in different housing markets can create varied, but equally efficient, industry responses. As Harris and Buzzelli (2002: 38) put it, this “challenges the view that the modern housing industry is backward, and that it must be viewed through a single lens”.

These points relate to notions of “path dependency”, the way technological development trajectories are reinforced by existing technologies and the impact of institutional, cultural or environmental factors on an industry’s development path. Path dependency has been explored in relation to Japanese housebuilding by Patchell (2002). He demonstrates how a combination of social, economic, political and geographical conditions has resulted in the co-evolution of large-scale industrialised housing suppliers and smaller, local craft-based producers. Others have discussed path dependency in relation to the transition towards free markets in housing in Japan (e.g. Zhou and Logan, 1996).

In this chapter, we develop the points made by Harris, Buzzelli and Patchell by focusing on the strategies adopted by Japan’s large national housing suppliers. We term these firms *mass customised housing suppliers* to distinguish them from smaller local firms also producing customised homes, but using traditional building techniques. The mass customised housing suppliers use “lean” and “agile” production systems, including the extensive use of prefabricated components, to deliver high levels of product choice at mass production costs (Barlow, 1999; Barlow et al., 2003; Naim and Barlow, 2003, for a discussion of mass customisation within housebuilding).

Our interest is in the way the Japanese mass customised housing suppliers have differentiated themselves from local suppliers and their possible future evolutionary path. The chapter is based on research carried out in the late 1990s and early 2000s on the introduction of mass customisation into the UK housebuilding industry. The research included four visits to Japan to study Japanese mass customised housebuilders. This chapter was previously published as Barlow and Ozaki (2005), which contains details of the research. We have updated parts of the paper where appropriate.

In the next section, we discuss the way key structural conditions such as market dynamics, regulatory framework and culture influence the business strategies adopted by housebuilders in general. Next, we discuss the evolution of

the Japanese mass customised housebuilding industry and how this has been shaped by the structural conditions within which it operates. In doing this, we take forward Patchell's findings on the co-evolution of the two main housebuilding sectors. Finally, we draw conclusions on the way in which innovation within the mass customised housing sector has been stimulated by its changing operating environment and the extent to which its possible future path is being shaped by current conditions in Japan. Although this chapter is not a comparison of the UK and Japanese industries, some UK data are provided as a contrast.

Influences on Housebuilders' Business Strategies

It has long been recognised that economic activity and its development pathways are socially and culturally embedded (Granovetter, 1985). As Harris and Buzzelli (2002, 2003) point out, a central theme to emerge from the industrial restructuring literature after the 1980s is that there is no single development path leading to a preordained best practice. Few industries have ever conformed to the ideal of mass production (Sabel and Zeitlin, 1985; Williams et al, 1992; Scranton, 1994).

The housebuilding industry is no different. Its business strategies reflect the structural conditions – market dynamics, regulatory framework, culture – within which its firms operate (Eccles, 1981; Barlow and King, 1992). These conditions include the prevailing land-use planning and building control systems, the ways in which new housing is financed, and cultural and historical factors such as the structure of landownership and attitudes towards property ownership. One feature that is said to be of particular importance in explaining the structure and strategies of housebuilding industries is the way its production processes are organised. In housebuilding, unlike most manufacturing activities, the site of the production process is geographically variable, its location shifting as buildings are completed in a form of “assembly line in reverse” (Ball, 1983; McKellar, 1993).

It has also been argued that construction as a whole is a supplier-dominated sector. Most innovation originates from the suppliers of equipment and materials and is less concerned with process innovation (Pavitt, 1984; Groák, 1992; Slaughter, 1998), inhibiting productivity improvements and complicating the integration of new products and components.

This combination of factors is said to be a key reason for the relative lack of large, capital-intensive firms in housebuilding and an impediment to innovation (Ball, 1996; Clarke and Wall, 1996). Inflationary conditions in housing markets dominated by speculative housebuilding are said to further reinforce these features. For example, Leijonhufvud (1977: 280–1) has noted that inflation means that “being good at ‘real’ productive activities – being competitive in the ordinary sense – no longer has the same priority. Playing the inflation right is vital”. This is particularly characteristic of speculative housebuilders (Barlow and King, 1992).

We will now turn to the Japanese mass customised housebuilding industry and show that these axioms do not apply – the industry involves centralised, highly capital-intensive firms competing on their ability to innovate in their production processes.

Key influences on housebuilding in Japan

With a population slightly less than double that of the UK, Japan builds almost six times the number of new housing units each year. Since 1987, when 1.7 million dwellings were completed, Japanese output has steadily fallen, to around 890,000 dwellings in 2014. A major difference between Japan and other developed economies is the very high ratio of new homes sold annually compared to existing home sales. However, in the last 15 years, the existing homes market has grown considerably. When we carried out our research, new housebuilding represented around 80% of total annual domestic property transactions (compared to under 5% in the UK). By 2012, the market for existing homes was estimated to represent around 50% of total home sales (Fudosan-Ryutsu-Keieikyokai, cited in Kobayashi, 2016).

At the time of our research, about half of all new completions were houses and over 90% of these were detached houses (Management & Coordination Agency, 1993). Approximately 75% of newly built detached houses were commissioned by individuals and built on their own plot of land to replace their existing house once it has outlived its usefulness. These houses are usually based on standard floor plans, but customised to a greater or lesser degree. This type of customer is almost always the owner-occupier of the house. The remaining 25% of new houses were built speculatively for sale, with purchasers being offered little or no choice over specification and design¹ (see [Figure 1](#)). This distribution of submarkets in the new housing sector has remained relatively consistent, although there has been a growth in apartment/condominium construction in the last 15 years (Ministry of Land, Infrastructure, Transport and Tourism, 2017).

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The important point is that the dominant housebuilding model in Japan does not involve speculative development, i.e. purchasing land and building homes without an identified purchaser. Most housebuilders in the replacement homes sector build houses to commission from households.

The scale and importance of this sector is a reflection of two factors. First, the historically strong cultural attachment to the land in Japan (Kirwan, 1987; Fukutake, 1989; Woodall, 1992; Hendry, 1995), reinforced by the post-1945 redistribution of farmland (Zetter, 1986), has played an essential role in shaping people's sense of private property rights (Yoshida, 1990). Second, lifetime employment with a single employer was a feature of the high economic growth rates from the 1950s to the late 1980s for much of the working population (Hendry, 1995). Together, these have meant that Japanese households tend to remain on the same plot of land for generations. Although the house itself may be demolished and rebuilt, as needs change, the land remains within the ownership of the family. The replacement cycle in this segment of the housing market has historically been around 26 years, creating a "scrap and build" culture. While the average age of houses demolished in Japan has grown slightly since we conducted our research, it is still estimated to be below 30 years (Kobayashi, 2016).

One outcome of this model is the reduced demand for second-hand and new speculative housing, described above. In addition, individual houses are regarded as consumer, rather than investment, goods – the investment value largely remains in the land (Ozaki, 1999). Because of the Japanese preference for new homes, second-hand values are little more than the value of the land alone. Either the existing house is considered to have no value, or it may

even reduce the land value because of the cost of demolition. In the mid-2000s, Koo and Sasaki (2008) estimated that single-family houses in the Tokyo area lost all their value 15 years after construction.

The regulatory framework within which this system operates has historically been relatively benign, reflecting a political and administrative system in Japan that favours minimum intervention in the economy (Alden, 1986). It is not necessary to obtain development permission outside a City Planning Area, although development in these predominantly rural areas is infrequent. Elsewhere, a zoning system regulates the size and form of building, with a presumption in favour of development permission. In recent years, while the land-use planning system remains laissez-faire compared to the UK, the building regulation system has been strengthened, shifting the focus from quantity to quality. The Basic Act for Housing 2006, for example, seeks to achieve various quality and energy performance standards as well as increase the lifespan of housing to about 40 years.

A final feature of Japan's housing market that needs mention is the property boom of the late 1980s. This was partly stimulated by an acceleration in economic concentration in Tokyo and other major urban centers, with demand for office space spilling over to land zoned for housing. This resulted in inflationary pressure and the conversion of residential sites into commercial development. The National Land Use Planning Act was modified in 1987 to control such speculative land transactions and land prices peaked in 1991. After this, Japan experienced sharp and continuous land price decreases.

The Origins of Mass Customised Housebuilding in Japan

As a whole, the Japanese replacement homes industry has not seen the same trend towards concentration that has been a feature in the UK since the late 1980s. Here, 55% of all private sector dwellings were built by the 18 largest housebuilders in 2000. In Japan, the largest 18 companies accounted for only 19% of the market that year (Barlow and Ozaki, 2001). There appears to have been some concentration since then, with the nine largest Japanese housebuilders accounting for 20% of the market in 2015, but the industry remains comparatively fragmented (Statista, 2017).

At the time of our research, the sector was divided into three types of housebuilders: over 80,000 local firms, accounting for more than 50% of completions; 150 regional housebuilders, who produced 20%; and a small number of national suppliers, responsible for the balance (Iwashita, 2001). Only 67 firms were supplying more than 300 houses per annum in the late 1990s, but some were extremely large. The largest, Sekisui House, supplied over 60,000 houses and apartments annually. By 2015, Sekisui House (48,000) had been displaced by Daiwa House Industry (51,000). In contrast, the largest UK housebuilder built around 11,000 dwellings in 2000 and 16,000 in 2015.

The first prefabricated housing suppliers appeared in Japan around 1960. Many of these were established by manufacturing companies involved in industrial sectors unrelated to construction. The sector grew rapidly from 1965 to 1975, stimulated by the initiatives of the Housing Loan Corporation to promote mass production of low-cost houses. However, while national policies provided the potential for a mass market, local housebuilders were not disadvantaged by these policies since demand was amplified across all market sectors (Patchell, 2002). To this day,

traditionally constructed houses using “post and beam timber” frames comprise nearly 80% of all custom-built houses (Iwashita, 2001). The imposition of a national building code also benefited local builders by imposing stricter standards and raising quality.

The second phase in the evolution of the mass customised housing suppliers occurred between about 1975 and 1985, when housing demand fell and firms began to move away from a mass production model towards one offering wider variation around standard house types. The relationship between the housebuilders and components suppliers was initially problematic because it was unclear who was responsible for the risks of carrying stocks of components (Iwashita, 1990). Furthermore, the smaller housebuilders were able to provide flexibility in housing design for their customers through the use of the post and beam construction method, and provided competition for the national builders who were seeking to move towards a more customised model (Patchell, 2002).

However, it was after the mid-1980s and during the 1990s that mass customisation emerged as a viable strategy for the large national housebuilders. This was achieved by the development of financially viable production and supply chain processes to enable high degrees of variation in housing. It was also underpinned by innovation at the customer interface in relation to design, sales and marketing. We discuss this in detail in the next section.

Mass customisation was able to develop during this period for several reasons. First, throughout the 1980s and 1990s the housing market was encouraged by the Japanese government, first in order to satisfy US insistence that it stimulate its domestic demand and later to boost the deflationary Japanese economy. Both these policies openly promoted the prefabrication methods of the national builders (Patchell, 2002). Second, the large firms were able to take advantage of their size to develop process innovation and achieve economies of scale and scope. Third, rising customer expectations in relation to quality, design, equipment and energy efficiency provided the national housebuilders with an opportunity to develop their production systems to meet this demand.

The national suppliers therefore changed the dynamics of the industry, an outcome being considerably increased competition for the local and regional housebuilders. As one commentator noted, the unhappiness of many Japanese with their homes at this time, in comparison with what they knew to be available, was taken as evidence by the major firms of a large market awaiting them (Ikegami 1997: 18; cited in Patchell, 2002).

The local and regional housebuilders were not completely disadvantaged during this period, though. Patchell (2002) explains how this sector’s production system was rooted in conventional building techniques, but these firms were able to adopt some of the economies of scale and product differentiation strategies of the national housebuilders by developing purchasing and advertising networks. This, however, meant there was a trade-off between maintaining a degree of independence and product standardisation.

Process and organizational innovation also occurred at the site assembly end of the supply system. According to Iwashita (1990), the increased housing demand from 1987 and shortages of labour at construction sites made it hard for smaller housebuilders to employ sufficient staff. This led to the emergence of “super subcontractors”. These are vertically and horizontally integrated networks of suppliers of major building elements, exterior finishing and carpentry works, who work directly under contract for a housebuilder. However, the super subcontractors are not tied to a specific firm and smaller housebuilders also use their services. The development of super subcontractors allowed many housebuilders to outsource the construction function altogether.

The next section will discuss the innovations introduced by the mass customised housebuilders during the 1980s and 1990s. We are particularly interested in the way the structural influences discussed above have impacted on the industrial development pathway of these firms.

Delivering Customised Housing – Innovation across the Production System

The mass customised housing suppliers have adopted a “quasi-standardisation” approach which controls the cost of components through constraints on variety of choice, even though they actually appear to offer more choice. This perspective, however, downplays the extent to which these firms have developed advanced production systems, along with sophisticated management of the customer interface, which is able to deliver highly desirable products to this segment of the market. Before we describe the methods developed by Japanese mass customised housing suppliers to achieve this, we will first describe the levels of choice they offer their customers.

Choice

The amount of choice offered depends on the firm, their market orientation and the construction technology used, but unlike housebuilders in many other countries, Japan’s mass customised housing suppliers offer choice across their entire product range and not simply those at the upper end of the market. Typically, a firm will offer up to 300 standard designs in terms of elevations and floor plans, which can then be adapted by the customer. Medium or larger British housebuilders, in contrast, typically offered a core portfolio of 30 standard floor plans, with little or no opportunity for adaptation at the time of our research (Nicol and Hooper, 1999; Hooper and Nicol, 2000).

Customer choice in Japanese housebuilding mainly relates to floor plans and internal specification. Sekisui House, for example, was offering around 22 house models, each with about 50 different floor plans. These could be built in either steel or timber frame, finished externally in various prefabricated cladding systems, and their interiors can be adapted to three basic design concepts (Japanese, Western or hybrid). Finally, customers could choose between different specifications of interior fixtures and fittings.

Japanese housebuilders offer a large range of internal “fit out” options from which the purchaser can customise their home. Firms maintain supply agreements with manufacturers of white goods and bathroom, lighting and storage products. These provide the standard range from which customers can choose. This is generally updated every six months. In addition, some optional items – such as ventilation systems – are included in the price of the house but can be rejected by customers if they wish. If customers are not satisfied with the standard range of fittings, they are able to choose from other manufacturers, although the housebuilder will charge a price premium on the item.

Choice is restricted, however, by four factors. First, exterior cladding choices are controlled in order for housebuilders to achieve economies of scale in construction processes, by building and planning regulations and by the size and shape of the plot. Second, there is the obvious constraint imposed by income, the starting point for all discussions with potential customers. Third, housebuilders are adept at managing customers’ choices by making

suggestions and holding approved pre-defined lists of fixtures and fittings. Finally, the size and orientation of the plot are critical. Orientation is especially important because Japanese households prefer the living and traditional “tatami” rooms to face south (Ozaki, 1999, 2001; Ozaki and Lewis, 2006). Nevertheless, the permutations of design, construction technology, interior design and specification are large compared to those offered by housebuilders in most countries.

Supporting Production System

Providing high levels of choice over design and specifications, and at the same time delivering homes on time and to a high quality, has required significant innovation across the entire production process. Underpinning the mass customised approach is the way the large suppliers have been able to use of standardisation (the complete and consistent interchangeability of parts) and pre-assembly of components and complete sub-assemblies (such as timber and steel frame systems and external cladding), to move from a focus on economies of *scale* in production towards economies of *scope*. The latter involves the introduction of processes that facilitate the production of a variety of models using the same machinery and material inputs. We describe the underlying production and supply chain processes elsewhere (Barlow, 1999; Barlow et al., 2003, Naim and Barlow, 2003). The salient point is that these firms have been able to move housebuilding away from the traditional “assembly line in reverse” model towards one where the bulk of production takes within the factory.

To help achieve this, major component suppliers have been encouraged to invest in dedicated housing production systems (Bottom et al., 1996; Gann, 1996; Gann et al., 1999). Long-term relationships with suppliers help to inform product development, and collaborative R&D with key suppliers is common. Together, these production technology and process innovations have enabled the mass customised housing suppliers to exploit opportunities for improving productivity and quality, improving managerial control and coordinating processes more effectively.

The Customer Interface

The introduction of standardisation and pre-assembly within the production processes has been coupled with the development of a sophisticated approach to managing the interface with the customer (Barlow and Ozaki, 2001, 2003).

Customisation inevitably means that housebuilders spend considerable resources at the front end of the customer relationship. Once a decision has been made to purchase, firms might spend three or four planning sessions with customers, which can last up to four hours each. However, purchasers sometimes liaise with the designer as many as ten times and one company said there could be as many as two meetings per week during the design phase.

The absence of large development sites that can accommodate show areas and sales facilities means alternative methods of enticing the customer have had to be adopted. In Japan’s small speculative detached housebuilding sector, potential house-purchasers are generally directed to development sites by advertising or estate agents. The mass customised housebuilders instead use the following four approaches: show villages, company-specific customer centers, word-of-mouth sales and repeat business. Show villages, which first emerged in 1966, allow

housebuilders to collectively display their show homes. There were 405 show villages in Japan in 2000, containing about 5,000 houses. Some are large, with 50 or more houses. Housebuilders also maintain large numbers of sales offices or customer centers. Sekisui House, for example, had 200 sales offices across Japan and, at any one time, 600 show homes.

Great stress is placed on word-of-mouth sales and repeat business. This is achieved through high levels of aftercare service, a reflection of the Japanese notion that a continuing relationship is part of the sale. More pragmatically, aftercare service provides valuable feedback for product development and may lead to word-of-mouth referrals and higher brand loyalty. Apart from follow-up visits within the first year of occupation to check and deal with any problems, the long-term relationship involves routine inspection and maintenance, the construction of extensions, and internal and external remodelling. Japanese housebuilders will continue to visit their customers and carry out surveys to capture their experiences of living in the home 10 or even 20 years after the sale.

Word-of-mouth referrals are high, compared to the UK, where rates at the time of the research were generally below 5%. Mitsui Home, for example, received 30% of its sales in this way (60% from show homes in housing parks and 10% from advertising or other sales promotion). At the time of our interviews, the company hoped to increase the ratio of the word-of-mouth introductions to 60%–70%.

The mass customised housing suppliers are placing growing emphasis on using the after-sales period to gather useful data for product development. A tool used by some firms is local “clubs” bringing together their purchasers and holding seminars on how to get the most out of the home. Large housebuilders are using their websites to gather customer feedback, providing advice to existing purchasers and generating sales of household products. They also capture the knowledge and experience of site assembly teams and sales personnel. Sales personnel feed their knowledge of changing customer needs via regular meetings with designers, and site assembly teams are used as a resource for improving the buildability of homes.

The Future Evolution of Mass Customised Housing Suppliers

Patchell (2002) argues that both the large national housebuilders and those operating at the local or regional level are constrained by path dependency in different ways. The former have sought growth through heavy investment in economies of scale and scope, which has necessitated a geographical expansion in return for forfeiting local responsiveness. The latter are constrained by local traditions, materials and relations, which afford some competitive advantages at the expense of their spatial scope of activities. Patchell also argues that the local embeddedness of smaller housebuilders has meant that the national firms face a challenge of spatial organization – they have had to create a sales and distribution infrastructure that is able to interact with customers locally.

There is some truth in this analysis, inasmuch as the mass customised housing suppliers cannot design as freely as their local competitors who are able to use their carpentry and assembly skills to tailor-make a house to an individual’s needs. However, this downplays the extent to which the former have been able to achieve a high degree of design flexibility and minimise the associated costs. As we saw above, the mass customised housing suppliers have been able to develop sophisticated customer interface and production systems to address the problems of

coordinating the range of potential design choices available to purchasers. This approach is, however, costly in terms of sales and marketing expenses. In 2000, about a fifth of Sekisui Heim's workforce comprised full-time sales people, and more than a third in Sumitomo Forestry, a more upmarket housebuilder. In the UK, sales staff might represent under 10% of total staff in a medium or larger housebuilder, including agency staff. Along with the heavy investment in manufacturing capacity and R&D, this ensures that the operating profit margins of Japanese housebuilders were therefore very low, generally around 2%–3%, and comparable to those of typical construction contractors (Barlow and Ozaki, 2001)².

Our question is how the organizational and spatial co-evolution of each housebuilding sector will develop in the future. Despite persistent economic problems, Japan still has almost 900,000 housing starts per annum. But downward pressure on housing market is evident as household formation peaks and the population declines. There is also mounting concern about whether Japan is simply building too many new homes (Koo and Sasaki, 2008; Kobayashi, 2016), as well the environmental cost of the scrap and build, mass customised housebuilding model (Braw, 2014).

There are therefore uncertainties over the future market for replacement housing. The need for a larger house or desire to replace an outdated one remains the primary driver for this market, but this might be tempered by two forces. First, an ageing population has resulted in a trend towards larger, three-generation homes, where ageing parents' and their children's households live under the same roof, but separately (Ozaki, 1999). However, any movement towards the replacement of larger three-generation houses would be dampened by growth in the apartment/condominium market if this included housing specifically designed for elderly people. Similarly, a parent's house can be sold by the children to a speculative developer, who then builds a number of small houses in the original land of plot (Ozaki, 2001). This recent trend would also slow down the replacement house building market.

Second, the long-term impact of introduction of temporary or part-time employment contracts, stagnating earnings and low expectations about future growth prospects would generally dampen the ability of households to replace their homes, with the result that an increasing number of Japanese owner-occupiers turn to renovation of the existing dwelling.

Under these circumstances, housebuilders in the mass customisation sector are therefore seeking new business strategies. One is to try to raise their market share. When we carried out our research, some interviewees felt there was scope to win business from the numerous smaller firms; this strategy is possibly reflected in the increased market concentration over the last 15 years, described above.

Another strategy has been to seek to rationalise their portfolio of housing designs to raise profitability and improve production efficiency. Sekisui House, for example, reduced the number of product models from 110 in 1997 to 50 in 2000. The challenge is to find ways of rationalising product ranges, while still offering the flexibility and choice offered by competitors.

Third, a number of housebuilders are attempting to compensate for the decline in new housebuilding by becoming involved in refurbishment for their existing customers. These include both large national firms and local builders and building products manufacturers. All maintain detailed customer databases that include the design and technical

specifications of the house. Some also see potential in offering repair services after major seismic and weather events.

The ability to organise large-scale production processes, coupled with the strength of their brands and all-pervasive emphasis on lifetime customer relationships, may ensure that the mass customised housing suppliers are able to carry out these three strategies and offer greater competition for the smaller local firms. However, a continuation of recent mergers and acquisitions, and vertical and horizontal alliances and integration throughout the housebuilding industry as a whole, could lead to the expansion of regional or larger local housebuilders and act as a counterweight for the mass customised housebuilders' expansion strategies.

Conclusions

The example of Japanese mass customised housing suppliers refutes the view that industrial development does not occur in housebuilding. These firms, as well as the smaller local housebuilders, have adapted to their environment. The emergence of the mass customised suppliers was a unique response to the structure and condition of the Japanese housing market and its social circumstances in a period of rapid economic growth.

Part of this has involved the coexistence and co-evolution of large industrialised firms and small local traditional builders. The flexibility of local builders in terms of design and planning – and their local connections, very important in Japan, especially in rural areas – is a huge advantage in the competition between industrialised national and local craft housebuilders. However, these two types of firm have influenced each other and the competition between them has helped them to evolve. Large national housebuilders have relied on innovation across the production process to match the local connections of small firms. While competition between the two sectors may increase as the scale of housebuilding declines, the emergence of supplier relationships, a consolidation of firms in the local/regional housebuilding and the introduction of tighter regulation to increase quality suggest that the two sectors will continue to evolve in tandem.

We argued above that the impact of house and land price inflation is an important structural condition explaining the lack of innovation in housebuilding industries. Japan's mass customised housing suppliers show how product and process innovation has occurred, despite high rates of land price inflation in the late 1980s, because the majority of housebuilding is non-speculative. Housebuilding in this segment of the Japanese housing market does not involve land development, since the plots are already in the ownership of the housebuilder's customer, so firms supplying this market are obliged to innovate to reduce production costs and develop new products to differentiate themselves competitively.

Responsiveness to customers' individual needs through levels of product customisation has become an important competitive strategy in some sectors. Menu-driven approaches to the supply of goods and services, whereby certain features are selected and products are tailored from a relatively standardised core of parts, are now common in many service and manufacturing sectors. Japanese housebuilders – and in particular those involved in mass customised supply – have extended this philosophy into the new homes market. Competition between firms is largely on the basis of levels of choice and service, rather than their ability to secure development land in the right place and at the

right point in the market cycle, as is the case with speculative housebuilders in the UK. This requires much closer integration of market intelligence with design and product development. The Japanese mass customised housing system amply demonstrates how this can be achieved in housebuilding.

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¹ Speculative developers who plan and develop whole communities include railway companies with large land holdings (e.g. Tokyu Dentetsu) and real estate companies (e.g. Mitsui Fudosan).

² Housebuilders supplying the replacement homes market do, however, benefit from extremely favourable cash flow, receiving 40% of the final price on commencement and further 30% once the house has been erected.