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**Working Paper**

Changing competition models in market economies: The effects of internationalisation, technological innovations and academic expansion on the conditions supporting dominant economic logics

Manchester Business School Working Paper, No. 572

**Provided in Cooperation with:**

Manchester Business School, The University of Manchester

*Suggested Citation:* Whitley, Richard (2009) : Changing competition models in market economies: The effects of internationalisation, technological innovations and academic expansion on the conditions supporting dominant economic logics, Manchester Business School Working Paper, No. 572, The University of Manchester, Manchester Business School, Manchester

This Version is available at:

<https://hdl.handle.net/10419/50701>

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# Manchester Business School **Working Paper Series**

**Changing Competition Models in Market Economies: The effects of internationalisation, technological innovations and academic expansion on the conditions supporting dominant economic logics**

Richard Whitley

Manchester Business School Working Paper 572  
June 2009

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## **Keywords**

Keywords: Competition Models, Fordism, Diversified Quality Production, Flexibility, Institutions, Internationalisation, Collapse of State Socialism, ICT Paradigm, Expansion of Public Science.

## **Abstract**

Different ways of competing in markets came to dominate particular sectors, regions and national market economies in the postwar period as a result of variations in market conditions, technological regimes and institutional contexts. These varied in terms of production volumes, basis of competition and rapidity of response to changes in demand and technologies. They were supported by six features of product, labour and capital markets as well as by particular characteristics of technological regimes. Since the breakdown of the Bretton Woods system, increased market internationalisation, the collapse of state socialism, radical technological change and the expansion of incomes, education and science have altered these features. Consequently, levels of support for many of the components of established competition models have changed, as has the dominance of these models in particular areas.

## **How to quote or cite this document**

Whitley, Richard. (2009). Changing Competition Models in Market Economies: The effects of internationalisation, technological innovations and academic expansion on the conditions supporting dominant economic logics. *Manchester Business School Working Paper 572*, available: <http://www.mbs.ac.uk/research/workingpapers/>

## Introduction

Comparative analyses of economic organisation and development have identified a number of distinctive complexes of dominant institutions, types of leading firms and economic coordination processes that became established in different kinds of market economies (e.g., Amable, 2003; Hall and Soskice, 2001; Hollingsworth and Boyer, 1997b). These models of social systems of production or varieties of capitalism typically linked particular institutional arrangements governing economic activities with particular kinds of firms and competition models to constitute relatively coherent systems that dominated certain economies in specific historical periods or, in some accounts, entire epochs of capitalism.

A central concern of these analyses of competing capitalisms has been to show how the dominant institutions governing private property rights, access to capital, the development and use of labour power, competitive behaviour and other economic activities vary significantly across capitalist economies in ways that structure the nature, direction and actions of firms and other significant economic actors (Casper and Whitley, 2004; Morgan et al., 2005; Whitley, 1999; 2007). In particular, the business strategies and competitive capabilities of leading firms were seen as being heavily influenced by the kinds of institutions that structured capital, labour and product markets in different market economies such that their relative success varied between industries and markets. Constraints on short term opportunism in West Germany, for instance, have been seen to encourage companies to pursue diversified quality production strategies rather than to focus on cutting costs and competing on price (Streeck, 1992).

In practice, if not always in theory, many such configurations of institutional arrangements and dominant firm types and strategies have tended to be identified with particular post Second World War nation states. The United States, for example, is often taken to exemplify a liberal market economy, while postwar West Germany manifests many features of coordinated market economies (Soskice, 1999). However, the extent to which the key institutions in any nation state are mutually supportive in their implications for economic action varies greatly between countries and historical periods, as does their standardisation of economic logics across sectors and subnational regions (Whitley, 2007:46-55).

Furthermore, in considering how and why particular competitive priorities become dominant in differently organised market economies, it is important to distinguish between the conditions encouraging leading firms to pursue particular kinds of strategies, on the one hand, and the varied institutional arrangements that contribute fulfilling these conditions, on the other hand. As Boyer (1988) has emphasised, different institutions can have similar consequences for firm behaviour in different economies, and similar kinds of institutional change can have different effects in contrasting circumstances, as the so-called "big bang" financial deregulation efforts did in London and Tokyo (Laurence, 2001).

Equally, changing conditions can render once dominant competitive strategies less effective in certain economies. If, for instance, the pursuit of low cost production and price-based competition in the Fordist model depends on a particular kind of regulatory

regime that stabilises demand levels, as Hirst and Zeitlin (1997) amongst others have suggested, then changes in the business environment that threaten such regimes can be expected to reduce its success. Similarly, removing barriers to entry by large firms and reducing trust between small firms in coordinated industrial districts will probably weaken some of the key conditions supporting the effectiveness of quality focused competition models and could destroy their economic viability (Crouch et al., 2001; 2004; Friedman, 1988). In general, changes in particular institutions and other features of the business environment are likely to affect the key supporting or inhibiting conditions for different competition models differently in contrasting situations and so have varied outcomes across market economies (Rule, 1997).

Insofar as distinctive forms of capitalism in which leading firms followed particular kinds of competition model did become institutionalised in differently organised market economies during the first three decades after 1945, then, we would expect these to have been affected by subsequent changes in national and international institutions, geo-political shifts such as the collapse of the Soviet Union, and other changes in the international business environment. In particular, changes in state policies and dominant socio-political coalitions in OECD countries that have encouraged greater economic internationalisation can be expected to result in a reduction of the national specificity of dominant competition models based on different levels of flexibility in responding to change, customisation and price in gaining market share and profitability.

To understand how the postwar forms of capitalism and prevalent competition models are likely to have altered as a result of changes in national and international business environments, then, it is important to examine these connections between different kinds of competition models and institutional regimes in the context of shifting markets, technologies and institutions in more detail. To do this, we need to specify: a) the main ways in which dominant competition models have varied in the postwar period, b) the key socio-economic conditions encouraging leading firms to follow such models, and c) the likely impact of recent institutional, market and technological changes on these conditions (Boyer, 2004). Accordingly, in this chapter, I distinguish between the major competitive approaches adopted by leading firms in the OECD economies in the postwar period and outline a framework for analysing how some of the key changes in the business environment since the collapse of the Bretton Woods system have affected the conditions encouraging companies to pursue these in different contexts.

First, I present a taxonomy of seven ideal types of competition models that resemble many of the dominant business strategies identified in comparative studies of 20th century capitalisms, such as Fordism, Diversified Quality Production (DQP) and radical, discontinuous innovation. These models reflect the different priorities that firms adopt in deciding how to compete in different markets and how they adapt to changing patterns of demand. In the following section, I suggest how different kinds of conditions seem likely to encourage firms to follow particular types. Next, I summarise the major changes that have taken place in, and between, many market economies since the 1960s and have often been cited as important factors influencing institutional and business system restructuring, and indicate how they can be expected to alter these conditions, and so affect dominant competition models in different economies.

## Types of Competition Models

Competition models are here understood as idealised combinations of particular kinds of trade-offs that firms are encouraged by the dominant institutions governing economic activities to make when competing in market economies. The rise of the mass production-mass consumption "paradigm" (Freeman and Louca, 2001: 273-277) in some 20th century societies, for instance, was greatly facilitated by the absence of strong constraints on market entry and exit, predatory pricing and rapid hiring and firing of employees at managerial behest (Hollingsworth, 1991). Additionally, since this kind of mass production involves substantial investment in dedicated technologies and routines for manufacturing highly standardised products using predominantly unskilled labour, it depends on market demand being reliably large and so the Fordist economic logic typically incorporates mass markets dominated by large oligopolistic enterprises as well as mass production. Such sustained and predictable patterns of demand have been supported by the development of the welfare state in many countries in the postwar period (Hirst and Zeitlin, 1997).

In many of the discussions of the different kinds of competition models current in the 20th century, Fordism has been contrasted with what came to be described as flexible specialisation (e.g. Hirst and Zeitlin, 1991; Piore and Sabel, 1984), although the term has been used in many different senses. This model typically includes small batch production of largely customised goods made with flexible general-purpose machinery by skilled workers. Competitive strategies are here focused more on the quality of goods and services and their customisation for different kinds of demand than on price, and rely on the existence of consumers able and willing to pay more for distinctive, high quality outputs.

Extending this contrast between Fordism and flexible specialisation, Hollingsworth and Boyer (1997a) suggest that three key dimensions for comparing different social systems of production are the volume of production, the basis of competition and the flexibility or speed of adjustment to market and technical changes. These involve trade-offs between: a) realising economies of scale in producing large volumes of standard products versus meeting the needs of different customers through shorter and more customer-specific production runs, b) gaining and keeping business through low prices versus high quality and functionality, and c) responding rapidly and radically to changing demand and technologies versus reducing costs by limiting changes to production processes and products. While firms often try to combine these features of competition models, by, for instance, standardising components while differentiating final products or improving quality while keeping prices down through outsourcing some parts of the production chain, at some point on these dimensions trade-offs between them are involved and reflect variations in market conditions, technologies and dominant institutions.

On the basis of these three dimensions, four distinct alternative social systems of production to Fordist mass production were identified by Hollingsworth and Boyer: Adaptive production, flexible diversified quality production, customised production and diversified quality mass production (see, also, Rubery and Grimshaw, 2003: 56-70). Most of these emphasise quality-based competition as opposed to the Fordist focus on price, but vary in their speed of response to environmental changes. Examples of

these four types of social systems of production at the end of the 20th century are claimed to be found in the pharmaceutical and software sectors, the consumer electronics industry, consumer fashion goods industries and the car industry respectively.

These examples highlight the variety of different kinds of competition models to be found in late 20th century capitalism and the need to go beyond simple dichotomies if we are to understand how established systems of economic coordination and control are changing. By combining the three main dimensions of volume, competitive basis and flexibility used by Boyer and Hollingsworth, we can identify eight possible types of competition models as shown in table 1. These dimensions are particularly important in contrasting competition models because they deal with the major trade-offs that firms make in deciding how to compete and develop organisation-specific competitive advantages. Although much of the literature concerned with these features focuses on manufacturing sectors, most of the trade-offs involved are equally applicable to service sector businesses.

#### TABLE 1 ABOUT HERE

In this table, I have dichotomised the three dimensions between *low* and *medium to high production volumes* of standardised goods and services, competition based primarily on *cost and price* reductions or on *improving quality and functionality*, and *low to medium flexibility* versus *high levels of fast responsiveness* to changing conditions. Low production volumes are differentiated from medium to high levels because the key decision here is whether to seek economies of scale through substantial batch sizes or contrarily focus on satisfying customer needs by tailoring outputs to suit them. Similarly, the key distinction with respect to organisational flexibility concerns the rapidity and wide ranging nature of firms' responsiveness to changing environments, particularly the speed with which, and extent to which, product ranges and work processes are modified as patterns of demand and technologies alter, rather than incremental, competence enhancing improvements.

Two of these ideal types of competition models, *Fordism* and *opportunism*, focus on high volume, price-based competition but differ greatly in their flexibility and speed or responsiveness to changes in demand. Fordism focuses on the large-scale production of homogenous goods with dedicated machinery and highly routinised work procedures for mass, largely undifferentiated consumer markets. As Chandler (1977, 1990) has emphasised, it was the integration of rationalised production processes with extensive advertising and mass marketing techniques through large managerial hierarchies in the USA that enabled many large companies to reap substantial economies of scale and scope throughout much of the 20th century in that very large consumer market. The Fordist competition model therefore involves more than the pursuit of low costs and prices through standardisation and routinisation of production. It additionally incorporates the control - or at least rendering predictable - of large markets for the volume of outputs and the systematic coordination of production with marketing and sales activities through managerial routines.

Key to its success has been the ability of engineers and managers to design and control production processes to achieve high throughput levels, reduce costs

continually and ensure market dominance through low prices. Fordist firms therefore had to develop strong coordinating capabilities to realise economies of scale through the establishment of a powerful technostructure (Mintzberg, 1983: 15-16) to specify, control and integrate work routines and activities. By routinising work procedures and dividing tasks into their simplest components, firms were able to rely on unskilled or semi skilled workers who could easily be replaced when business conditions changed. Flexibility of outputs was therefore achieved by changing the volume of goods produced, not their characteristics or the ways they were produced. As Boyer and Durand (1997) have emphasised, Fordism is essentially a producer driven production system, in which consumers are sold what companies produce rather than firms producing what consumer tastes demand.

Such an elaborate and large-scale system focused on the low cost production and sale of standardised goods was expensive to establish and difficult to change quickly to accommodate market shifts. It therefore required control over critical inputs to ensure continuous throughput and use of the costly specialised machinery. Particularly in the USA since the implementation of anti-trust legislation, this encouraged substantial vertical integration to ensure continuity of supply and, in some sectors, control over distribution channels and after-sales service (Hirst and Zeitlin, 1997; Hollingsworth, 1991; Langlois, 2003). The most obvious example of the Fordist competition model is the 20th century US car industry, but it also has been followed in many consumer durable sectors in the USA, as well as in parts of the food industry (Chandler, 1977). More recently, a number of service sector firms have developed Fordist characteristics, as in the fast food restaurant business and retail banking, in order to realise economies of scale by standardising work processes, outputs and customer contacts.

While opportunistic production shares many of these characteristics, it is distinguished from Fordism by its ability to shift production between product lines such as wigs, plastic flowers and toys relatively quickly and adapt rapidly to changing market demands. Exemplified by the "hustle" economy of Hong Kong, as well as some other Pacific Asian economies in the 1970s and 1980s (Enright et al., 1997: 45-48; Redding, 1990), which switched its major industries with impressive speed, this kind of production system competes both on price and fast responsiveness to changes in customer needs in its major markets that are often some distance away. In many East Asian economies, the rapid growth of this competition model was tied to the restructuring of the US retail sector and the rise of large retail chains such as Wal-Mart, as well of course on cost reductions in transport and information transmission costs (Hamilton, 2006: 156-178)

In contrast to Fordism, this flexibility is based on relatively low investment in capital intensive, dedicated machinery and limited development of managerial routines and formal procedures. Instead of realising large economies of scale through high levels of formal standardisation of work processes and coordination routines, the key competences here are entrepreneurial, especially the ability of the owner manager to seize new opportunities rapidly by changing products, processes and industries, together with an ability to reorganise work processes and direct semi-skilled labour. They do not, though, involve the development of radically new products and processes that restructure markets. Responsiveness is here more reactive to changing demand patterns than proactively reshaping them.



The remaining two possible price-based with low volumes types of competition model are unlikely to be stable because high volume production strategies can usually dominate small scale producers unless the latter are institutionally protected from predatory pricing by large firms. While small-scale production of cheap goods with poorly paid labour is of course not uncommon in the history of capitalism, it is difficult to see how it can compete on price against large volume factory-based competition. This has especially become the case since declining communication and transport costs coupled with the internationalisation of competition have intensified competitive pressures from large volume producers across the world and helped to create mass international markets that encourage investment in high volume production facilities.

The four types of quality-based competition models differ in their standardisation of outputs and batch volume sizes, on the one hand, and in their flexibility and speed of responsiveness on the other hand. *Craft* production combines small batch production by highly skilled workers with considerable customisation and an ability to respond to incremental demand changes. However, the formal development and certification of such skills can limit the speed of adjustment to radical technical and market shifts, particularly where these devalue current competences and threaten social identities. Cooperation between specialist producers can facilitate learning and incremental innovation in craft-based industrial districts so that firms can continue to adapt effectively to such shifts, but their dependence on institutionalised and slow changing forms of expertise limits the degree of work restructuring that can be achieved in the short term. The stability of craft skills here resembles that of the traditional professions where practitioner elites control training, certification and labour market entry and some project based firms in the feature film industry (Christopherson, 2002; Whitley, 2006).

*Flexible customised* production, on the other hand, combines limited volume production of quite customised goods and services and quality-based competition with faster rates of market responsiveness and flexibility. It is perhaps particularly noticeable in many business service industries where highly skilled staff work together to produce specialised services for a wide range of customers. Innovation in developing new services is here key to firm growth and personal careers, as Anand et al (2007) have shown in their study of new practice development in management consultancy and related fields. Similarly in advertising, originality and "freshness" seem to be a competitive advantage (Grabher, 2002), and so employers and employees frequently change the kinds of services and skills they offer. Here, firms are able to organise product development and delivery teams in a variety of ways for different customers and can acquire - or coordinate through subcontracting and various forms of collaboration - new knowledge and skills relatively easily. While depending greatly on the skills of staff to provide high quality services, their expertise is organised and directed to deal with a range of complex and novel problems in this model.

Whereas traditional professional and craft production systems typically segment tasks and problems around established skills, as in Mintzberg's (1983: 190-210) characterisation of professional bureaucracies, in this competition model they are dealt with by collectively coordinated teams of experts that have to work together in novel ways and generate new knowledge and expertise in tackling unusual problems. Work

roles and the division of labour are more flexible and responsive to changing customer demands in this model. Solutions and outputs are correspondingly varied and not so bounded by certified skills. It follows that a key managerial competence here concerns the ability to acquire, coordinate and motivate teams of diversely skilled people to work together in solving customers' problems in ways that develop collective capabilities as much as individual skills. Many business service firms employing professionally trained staff to solve complex and novel customer problems pursue this kind of competition model.

*Diversified quality production (DQP)* combines relatively large volume production of differentiated goods and services with a competitive focus on high quality and responding to changing customer needs. According to Streeck (1992:5-7), technological changes in the 1970s, particularly the growing use of micro-electronic control devices, enabled many German firms to lower the breakeven point of mass production and customise production of high quality goods to a much greater extent than before. In the institutionally rich society of West Germany where market relationships were embedded in an array of cooperative institutions and a highly skilled labour force was used to engaging in joint problem solving, such new technologies led many firms in the broad engineering sector to focus on customised quality production in which small batch production of customer-specific goods was combined with large batch production of basic components.

*Flexible mass production of differentiated goods and services (Flexible MPDG)* is differentiated from the DQP model by its much faster responsiveness to technological and market changes. While both of these models are more flexible than Fordism in adapting their product lines for changing consumer tastes as well as improving production processes, flexible MPDG is more able to restructure production and incorporate technical changes into the development of new product ranges speedily. In particular, firms pursuing flexible MPDG strategies focus on the rapid development and commercialisation of new products on a continuing basis by investing considerable resources in R&D and using their technological competences to diversify into related fields and markets. A key competitive capability for such firms is their ability to absorb, develop, and adapt new knowledge quickly for product development and marketing, and so integrating research, design, manufacturing and marketing activities through cross-functional project teams is often a core competence, as seems to be the case in the Japanese consumer electronics industry (Berggren and Nomura, 1997; Sturgeon, 2007). DQP strategies, in contrast, are less concerned with the rapid introduction of new products to large markets as opposed to continuing incremental improvements of more customised outputs within particular technological trajectories.

In addition to these eight ideal types of competitive models, the success of radical innovation strategies in some emerging industries, such as biotechnology and parts of the ICT sector, suggest a need to distinguish further between forms of responsiveness to change, as do Boyer and Hollingsworth (1997) in their separation of adaptive production from flexible DQP. In particular, recent work on what Teece (2000: 54-59) has termed high-flex Silicon Valley type firms and networks and their reconfigurational dynamic organisational capabilities has highlighted the growing significance of *discontinuous innovation* strategies in which current competences become superseded by quite different ones (Casper, 2007; Teece et al., 1997). Such competitive models

focus on generating and commercialising disruptive technologies that radically change markets and threaten the leading position of dominant firms in them (Christensen, 1997).

Whereas the flexible MPDG logic focuses on extending and enhancing current organisational capabilities and competitive competences to produce new products and services, firms pursuing discontinuous innovation models are more concerned to develop new kinds of knowledge and skills that are qualitatively distinct from those currently dominating markets and effectively destroy their competitive advantage. In highly technologically dynamic industries, such competence destructive strategies often involve the rapid acquisition and use of new scientific and technological knowledge, much of which is produced by researchers in public science systems as well as by private companies' R&D laboratories.

These innovations qualitatively alter processes and products so much that many current organisational capabilities become uncompetitive, either by reducing costs considerably or by radically improving the functionality or quality of products, as in the hard disk drive industry (Christensen, 1997; McKendrick et al., 2000). They therefore can compete on price or quality, and often both. In industries dominated by this model, fast responsiveness to new scientific and technological knowledge and market opportunities is a, if not the, crucial competence, which includes the ability to invent, develop and manufacture new products faster than competitors in ways that enable the winning firm to dominate existing markets or create new ones, as in the case of FrontPage (Ferguson, 1999).

While the overall economic significance of this kind of competitive model may have been overstated by some enthusiasts of the knowledge based economy, its importance in some emerging and fast growing industries suggests that it is worthwhile to distinguish flexible competitive models that build on and enhance existing knowledge, skills and collective capabilities from those that imply a much greater and more radical reshaping of organisational competences, often through the acquisition of new staff and/or companies. Additionally, since much of the literature of Silicon Valley and similarly innovative regions emphasises the distinctiveness of the business environment and supporting institutional arrangements, it is important to separate this kind of ideal type from flexible MPDG if we are to understand how different conditions and contingencies encourage or discourage the dominant role of different competition models in different contexts.

### **Conditions Supporting Different Competition Models**

These different kinds of competition models are likely to become established as dominant economic logics in particular kinds of sectors, regions and countries with distinctive technological regimes, market conditions and institutional contexts. Fordist strategies focusing on very high volumes of standardised goods, for instance, depend on access to mass markets for relatively undifferentiated products where demand is predictable enough to justify the considerable investment in dedicated machinery and managerial coordination. In capital-intensive sectors, they also depend on a ready supply of technical specialists and managers to design, coordinate and manage the integration of mass production with mass marketing. Price-based competition

additionally relies on a large supply of unskilled and semi-skilled labour constrained to work on routinised, standardised tasks under the control of employers' agents.

More quality-based competitive strategies, on the other hand, depend on firms continually improving products and processes and adapting to customers' needs. Developing these competences usually requires considerable restrictions of short-term opportunistic behaviour to encourage firms and employees to invest in collective firm-specific capabilities to develop and produce high quality goods and services (Hirst and Zeitlin, 1997; Streeck, 1992). They additionally rely on firms being able to sell their outputs to differentiated markets where consumers are willing and able to pay for better quality and distinctive products and services.

Fast responsiveness to market and technical changes requires considerable organisational flexibility and an ability to develop and adapt to new knowledge. While this can be achieved through numerical flexibility in less complex production processes where quality is not central to competitive success, it usually depends on employees being willing and able to learn new skills and develop novel work processes to meet changing customer demands. Rapid adjustment to changing conditions is additionally supported by modular production processes where the design and manufacturing of particular components in value chains can be changed without having to alter the whole system (Gereffi et al., 2005; Sturgeon, 2002). Much more radical and competence destructive strategies depend on greater flexibility in generating and using new knowledge and skills, as well as ready access to risk capital and highly skilled technical specialists. Again, modularity helps to limit the amount of capital at risk in developing and commercialising any one such innovation by restricting the investment needed to only one part of the system.

The key conditions supporting these seven distinct types of competition models include, then, market characteristics, institutional frameworks and technical capacities. Simplifying considerably, they can be summarised as six dimensions. First, the *size of product markets and their differentiation* by taste, income levels and preferences for high quality goods and services. Second, the level of institutional *constraints on short-term economic opportunism* that restrict rapid entry to, and exit from, business relationships, including employment, and the unilateral exercise of market power. These institutional arrangements include strong employer and trade associations that limit free riding strategies, as well as rules governing competitive behaviour that limit predatory pricing and taking advantage of short term difficulties to squeeze suppliers. Third, the widespread *availability of knowledgeable risk capital* in the form of a sophisticated venture capital industry that provides funding for high-risk activities. Fourth, access to a large *supply of high skilled technical specialists* and professional staff whose skills are reliably certified. Fifth, rapid access to the growing amount of *new scientific and technical knowledge*. Sixth, the ease of *modularising* the value chain and disintegrating production processes.

Some of these conditions are most relevant to only a few of the seven competition models and overlap in their implications. Many also complement each other to a considerable degree in their impact on the establishment of particular economic logics. In table 2 I suggest how different levels of these six conditions support their

institutionalisation, distinguishing between: low, medium, and high degrees, and will now discuss these interconnections further.

## **TABLE 2 ABOUT HERE**

In the case of Fordism, ready access to mass markets that are largely undifferentiated by regional or cultural tastes is a crucial condition for it to dominate a particular market economy (Piore and Sabel, 1984). Its focus on maintaining optimal use of dedicated machinery and other capital equipment also implies that flexibility in responding to market shifts is mostly achieved through changing input volumes and labour utilisation. Such changes are greatly facilitated by a business environment in which there are few constraints on opportunistic behaviour, especially in labour markets where there are few legal restrictions on employers hiring and firing staff at short notice and few strong labour unions capable of resisting such managerial actions. They are also made easier by making most jobs highly routinised and tasks easily carried out by semi-skilled workers who can be trained in a few hours. Such staff are usually thought to have few, if any, firm specific skills and knowledge that add substantially to their employers' competitive competences, and so can readily be dismissed without serious effects on their future growth.

The dominance of price-based competition additionally encourages such companies to develop adversarial and arm's length relationships with their suppliers and take advantage of their size in negotiating low prices, rather than engaging in more collaborative and longer term partnerships in which both firms benefit from joint development of product and process improvements and skills. Economies in which firms can become very large, through acquisitions for instance, and there are few restrictions on exercising market power, are therefore more likely to encourage Fordist strategies than those in which companies are limited in their freedom to dominate industry partners.

Finally, it is important to note the crucial role of technical specialists and managers in establishing and running such large and complex organisations coordinating mass production with mass marketing activities. As Chandler (1977; 1990) claimed in the case of large US firms in the 20th century, it was these middle and senior managerial employees who effectively constructed the key coordination and control mechanisms that generated economies of scale and scope in capital-intensive sectors. Such staff are also important in constructing service factories in which standardised outputs are generated through formalised work processes for a large number of undifferentiated customers, as in many forms of retailing, including banking. A necessary condition for the dominance of Fordist models, then, is a ready supply of competent staff to design and implement such mechanisms who are committed to their employers' success and develop firm specific skills and knowledge.

In sum, for Fordism to develop and become established as the major competitive model in a market economy, owners and managers have to be able to construct large and complex organisations for producing standardized goods and services for mass markets with few institutional constraints on how they do so. Weakly organised skilled workers, as well as easy access to specialised production machinery are also important conditions. In addition, few formal and informal regulatory constraints on

predatory pricing or on changing business partners at short notice are necessary to enable dominant firms to be responsive to changing circumstances (Hollingsworth, 1991).

Many of these conditions are also important for opportunistic competition models to develop, especially weak constraints on short-term economic opportunism and easy access to mass markets. The major difference from Fordism concerns the speed of responsiveness to market changes and ability to seize new commercial opportunities when they arise. This effectively means that firms do not invest in the creation of large and complex organizations dedicated to the mass production of homogenous outputs with capital-intensive facilities.

Rather, they focus on low cost production of relatively simple products for large consumer markets with facilities that can be amortised and changed over much less time than Fordist ones. In some cases, product specific machinery is provided by customers in buyer driven commodity chains and opportunistic firms concentrate on managing work processes directly rather than investing in elaborate managerial hierarchies. Since key competitive advantages for such firms are access to, and efficient management of, easily trained and low cost labour that can be changed rapidly to suit changing market needs, both low cost communication technologies and the ability to codify knowledge easily in design and production activities are important enabling conditions. These factors have also facilitated the development of some routine service activities in emerging economies, such as call centres.

Competitive models that focus more on quality than price tend to rely much more on the knowledge and commitment of skilled production workers to improve products and processes continuously and to respond flexibly to changing conditions. In the case of craft production, for instance, the emphasis is on meeting the demands of customers for high quality and specific goods and services with flexible, multi-purpose machinery operated by highly skilled staff. Responsiveness to customers' needs and incremental improvements in performance are more important competences here than are reducing unit costs and realising economies of scale through standardised work processes.

To remain competitive with low price, high volume Fordist strategies, such models depend on there being effective barriers to short term opportunism that prevent large firms from undercutting craft producers with predatory pricing and taking over successful SMEs with their skilled workers. In the case of the traditional professions, of course, practitioner elites controlled access to their services and the certification of those able to provide these. In many industrial districts, these kinds of competition models have been supported by local institutions providing what Crouch et al (2001; 2004) have termed collective competition goods.

For example, in the 1980s small and medium sized Japanese machine tool firms in Sakaki township were supported by the local provision of substantial collective competition goods by the Chamber of Commerce, local government and strong regional identity of workers and owners that encouraged equipment sharing, facilitated product diversification and prevented price and wage squeezing by large customers. According to Friedman (1988), this collective commitment to high quality products

made with highly skilled workers depended on, and was reproduced by, continuous training and upgrading of machinery and competences to attract the best staff. Similar commitments to high quality outputs and continuing technical improvements with extensive training for skilled and less skilled staff that limit both customers' ability to enforce lower prices and competitors' competences in mass producing similar products have been found in Denmark and some other parts of continental Europe (Crouch et al., 2001; Kristensen, 1992).

Because firms' competitiveness depends so much here on the flexibility, technical abilities and commitment to learning of employees, companies have to maintain high wages, offer jobs with considerable technical interest and challenges and provide access to training if they are to retain key staff. This tends to restrict them from competing for large orders at low prices that threaten to routinised major parts of the production process. Work intensity, however, remains quite high in such models, together with job satisfaction (Kristensen et al., 2009; Kyotani, 1996).

The main differences between craft production and flexible customised production concern the ability to respond quickly to changing market conditions and technical innovation through restructuring work processes and teams to generate new solutions to complex problems for relatively sophisticated customers. This involves combining and enhancing skills and expert knowledge in novel ways that not only extend current competences but also create new ones that enable firms to enter new markets such as those leading to the establishment of new professional practices in some business services (Anand et al., 2007). Greater levels of organisational flexibility are therefore an important requirement for flexible customised competition models, which depends on considerable employee commitment to meeting, and adapting to, customers' needs. A willingness to develop innovative work processes and collaborate in dealing with novel and complex problems is therefore important for firms pursuing this kind of competitive strategy, and so constraints on changes to personnel and business partners cannot be very strong.

While strong skilled labour unions support craft based strategies, then, they may well limit such skill enhancement and restructuring, especially where job territories are tied to narrowly defined and inflexible skills (Marsden, 1999: 42-44), thus inhibiting the generation of new knowledge in project teams. Since the coordination and organisation of highly skilled teams is more critical to firm success in this approach, it follows that an ample supply of competent project managers is also more important in this case than it is for craft production strategies. A large supply of certified technical and professional specialists is also required, together with access to new technical knowledge that can be used to develop new products and services

In the case of DQP, cooperative relationships between firms and between employer and employees depend greatly on institutions encouraging investment in broad skills and wide-ranging collective capabilities and restricting short-term opportunistic behaviour, such as free-riding on competitors' training provision. It "requires", as Streeck (1992: 4) puts it: "a *congenial organisational ecology*, the presence of *redundant capacities* and a rich supply of *collective production inputs*", which in turn rely on effective formal and informal institutional constraints on highly short term market rationality and support the collective provision of key inputs.

These include training systems that encourage both employers and workers to invest in the development of broad skills and abilities to learn new knowledge, wage setting arrangements that prevent poaching of skilled staff, and collective institutions that encourage companies to share knowledge about technologies and markets and some investment risks. Strong trade associations that advance the interests of their members effectively and are able to sanction opportunistic behaviour, which could harm collective capabilities, are often key features of market economies in which DQP becomes established.

Key to such developments are institutions that encourage trust and commitment between the major groups involved, whether these are formal and legally constituted constraints on opportunistic behaviour or more informal collective commitments as found in some Asian countries, that extend beyond single contractual exchanges and incorporate both skill and knowledge sharing and collective investments. Such collaboration depends on legal regimes that permit some inter-firm cooperation and restrict the exclusivity of private property rights. It therefore is inhibited by strong and effective anti-trust legislation such as that developed in the USA in much of the 20th century (Campbell and Lindberg, 1991).

Diversified quality production of larger quantities than those typical of craft production - often incorporating standardised components - additionally implies the existence of a customer base that has sufficient disposable income and varied tastes to pay for differentiated high quality products. The expansion of consumer markets during the "trente glorieuses" after 1945 in many OECD economies helped to create such a pattern of demand, especially in societies where cultural distinctions remained significant and were reflected in consumer preferences. Relatively large markets for distinctive products thus helped to support the replacement of Fordism by DQP in many of the richer market economies during the last third or so of the 20th century.

As the contrast of postwar Germany with Japan highlights, many aspects of DQP can be achieved in different ways. In particular, strong unions, sector-wide wage determination through formal procedures and organisations, and national training systems coordinated by the state, unions and employer groups do not seem to be necessary institutions for DQP. However, strong trade associations, employer agreements on wage policies, poaching and similar issues, effective diffusion oriented technology policy (Morris-Suzuki, 1994), and the provision of many collective competition goods at local, regional and national levels, in conjunction with limited restrictions on inter-firm cooperation, do appear to be important factors in the development of DQP as a major competition model.

The critical feature of such business environments is their encouragement of employer and employee investment in developing broadly based competences and knowledge that enable them to adapt to, and anticipate, changing circumstances through joint problem solving and collective commitment to organisational success. This implies the discouragement of owners and managers taking advantage of business partners' short-term difficulties, whether employees, suppliers, customers or investors, at the expense of longer term collective advantages.



More flexible and rapidly responsive mass production of differentiated goods implies a faster rate of product innovation, often linked to new scientific and technological knowledge. Key competences here include the ability to translate new knowledge into new products and services and reach consumer markets quickly. This typically requires extensive investment in engineers and managers, easy access to new formal knowledge, and a strong capability to integrate development, production and distribution effectively.

It also relies on high levels of organisational commitment and cross-functional collaboration in project teams such that skilled staff focus on contributing to firm-specific competences, even at the possible expense of developing their own specialist skills. In turn, long term employer-employee commitment and organisation-specific career paths encourage such collective cooperation and are supported by relatively weak external labour markets and weak occupational identities, as Cawson (1994) suggests was key to Japanese electronics firms' success in the 1980s. High levels of flexibility are also enhanced by the modularisation of production and distribution processes that enables part of technological systems to be altered without having to make systemic changes to the whole

Considering finally the conditions supporting the establishment of the discontinuous innovation competition model, a considerable number of factors have been suggested in the literature on Silicon Valley and similarly innovative regions (see, e.g., Bahrami and Evans, 1995; Casper, 2007; Kenney, 2000; Lee, 2000). Among these are: flexible labour markets, strong and knowledgeable venture capital companies coupled with liquid stock markets that enable such firms to exit from successful start-ups and so adopt a portfolio approach to investing in highly risky new ventures, a supply of highly educated scientists and technologists as well as experienced managers of such companies, close connections between leading research universities and innovative firms, including effective mechanisms for transferring new knowledge and skills between them, and a generally supportive environment for developing innovative technologies and markets with a wide range of business services and skills for facilitating new firm formation (Suchman, 2000).

The key requirements for this model concern: a) incentives to make the high risks involved worth undertaking, b) means of limiting these through diversifying commitments and/or easily shifting resources to new activities and obtaining alternative employment, c) institutions that enable firms to deal with market and technical failure by acquiring new kinds of knowledge and skills at relatively low cost, and d) a ready supply of business services that support entrepreneurs in seizing opportunities quickly. Among the major incentives are winner-takes-all markets in which successful new ventures are able to dominate large markets and reap the concomitant rewards. Allied to this is the ability to restrict appropriability risks through patenting or similar intellectual property protections and the existence of visible milestones of progress towards product development and manufacture that enable investors to assess technical progress at frequent intervals (Tylecote and Visintin, 2008).

Investors are more able to manage the high failure risks involved in such innovatory activities when they are well informed about the technologies and markets involved,

can offset frequent setbacks and project collapses with less common - but highly lucrative - successes in diversified investment portfolios, and are able to realise their profits through trade sales or initial public offerings on large and liquid stock markets. These kinds of competition models are therefore more likely to become established when financial systems encourage the development of large groups of knowledgeable venture capitalists and serial business angels who are able to raise large funds from institutional and private investors, and can sell stakes in successful companies in a well established market for corporate ownership.

Risks can also be mitigated by focusing on products that function as parts of technological systems rather than attempting to create an entire system from scratch. Modularity and the ability to concentrate on part of the invention, development, manufacture and distribution process, and thus restrict the amount of capital required, are therefore common features of industries where this kind of competition model predominates.

From the point of view of employees, failure risks are easier to deal with when companies are located in regions where there is an agglomeration of similar firms that can offer employment to staff of failed enterprises. As Casper (2007) has emphasised, the existence of such potential employers encourages professionals to contemplate investing their energy and skills in risky endeavours, just as many industrial districts provide some safety cushions for skilled staff wanting to set up their own businesses.

Where innovations are, in addition, closely dependent on new formal knowledge about physical and biological processes, and on research skills for producing it, fluid labour markets for research scientists and engineers and for technically competent managers, are also important supportive factors. This is especially so if they encourage movement between research organisations such as universities and private firms. This both facilitates the transfer of knowledge and expertise and provides some possibility of reemployment for researchers who join companies that fail or are taken over. If business employment is seen as a sign of intellectual weakness and universities are segmented from commercial goals and interests, on the other hand, then the establishment of radically responsive, discontinuous innovation models is less likely.

### **The Impact of Changes in the Business Environment on the Conditions Supporting Different Competition Models**

Many of these conditions supporting the establishment of particular competition models have been affected by significant changes in the institutional, technological and macro-economic contexts of business activities since the collapse of the Bretton Woods system. These can be summarised in terms of five main sets of changes that have resulted from, and in many cases reinforced, changing interest group coalitions in some of the major OECD economies and a widespread tendency for many states to reduce formal controls over competitive behaviour in, and entry to, many markets, especially financial ones. *First*, the internationalisation of product markets, capital markets and managerial coordination of economic activities through MNCs and various forms of quasi-organisational integration. While the extent and significance of these changes remain hotly debated, they have certainly altered many features of the environment in which such conditions became established.

*Second*, the geopolitical changes associated with the collapse of the Soviet Union and economic reforms in China and other state socialist regimes have had major consequences for many of the conditions supporting or inhibiting competition models. *Third*, the dramatic changes in information and communication technologies, including the digitalisation of much codified knowledge, have sharply reduced communication costs and greatly facilitated the coordination of activities over large distances, thus of course aiding the international coordination of production and exchange. Whether they amount to a radically new techno-economic "paradigm", as some have suggested (Freeman and Louca, 2001; Tylecote and Visinitin, 2008), is debatable, but they can be expected to affect organisation structures and integration processes.

*Fourth*, the extensive periods of economic growth in most OECD countries since 1945 have greatly increased consumers' disposable income as well as enabling the expansion of state welfare services and social protection. Together with market saturation in many consumer goods industries, this has reinforced shifts in patterns of demand. Finally, fifth, most national governments have invested in the expansion of state education systems, particularly higher education, and of support for public scientific research, albeit in different ways in different countries. Many have also developed science and technology policies aimed to improve national economic competitiveness through encouraging technical change and innovation.

These varied changes in national and international business environments are having different kinds of consequences for the conditions listed in table 2, both separately and in conjunction with each other. Furthermore, how they affect established competition models and business systems in particular socio-economic contexts depends greatly on dominant institutional regimes and interest group coalitions (Amable, 2003; Whitley, 2007). In table 3 I summarise the major kinds of effects these five sets of changes can be expected to have on the critical conditions supporting or inhibiting the seven types of competition models identified in table 1. As can be seen from the blank spaces, many of these changes are likely to affect only some of the six conditions discussed above.

### **TABLE 3 ABOUT HERE**

In very broad terms, all three aspects of economic internationalisation can be expected to reduce national institutional constraints on economic opportunism and the cohesion of national interest groups supporting these. Beginning with the opening of national product markets to foreign companies and extension of most favoured nation principles to firms from most countries in the world trading system (Braithwaite and Drahos, 2000), this has facilitated the expansion of markets for standardised goods, lowered entry barriers and intensified competition. It also weakens the ability of domestic firms and their employees to limit price competition and collaborate in preventing free riding.

However, it does create opportunities for firms pursuing quality based competitive strategies to sell to foreign markets and, when coupled with reduced communication and coordination costs, integrate supply chains across different market economies. In societies with a large supply of skilled labour and strong domestic labour unions, these opportunities may encourage such companies to continue to follow DQP logics by

combining lower costs with larger markets for their higher quality products, as has perhaps happened in Denmark since 1990 (Kristensen et al., 2009).

For quality-focused firms under pressure from lower cost foreign producers, these opportunities enable them to reduce domestic diversification and focus more on delivering specialised outputs for international customers, as Meyer (2006) found in the case of some large Danish firms. Such strategies are of course facilitated by ICT innovations, which speed up feedback from distant markets and encourage flexibility. The general opening up of foreign product markets can therefore increase the volume of demand for both standardised and more differentiated products and services as well as supporting both price and quality focused competition models. It additionally supports the development of radical innovations by enlarging the potential market for new products and services, thus increasing the possible payoffs from risky innovations.

The internationalisation of capital markets has likewise reduced the ability of financial and business elites to coordinate their activities and limit opportunism within national borders, especially when combined with the growth of institutional fund management, declining state regulation of financial markets and the removal of barriers between different financial services businesses. Pressures for increasing financial returns are being intensified as foreign investors seek to improve investment fund performance across national markets and limit the ability of labour unions to maintain their share of national income. As fund managers are increasingly subject to short term performance measures, such pressures are likely to inhibit the ability and willingness of firms to invest in medium to long term commitments to business partners and employees at the possible expense of shorter term financial returns.

Again, though, these pressures can be mitigated, or even negated, by national restrictions on shareholder powers, variations in shareholders' voting rights, limitations on hostile takeovers and the capacity of national political and economic elites to mobilise opposition to foreign investors' short-term interests, as many European states have shown in recent years (Morck, 2007). Additionally, the growth of cross border capital flows can facilitate access to well informed venture capital, thus enabling new firms in emerging industries to overcome national resistance to providing risk capital for radically new technologies, as seems to have happened in some Dutch and German biotechnology companies (Lange, 2009; Paauw, 2009).

While, then, the internationalisation of the shareholder base of large firms pursuing DQP and similar strategies may reduce employer-employee commitment, investment in training and continuing product and process upgrading domestically, this effect varies between industries and also depends greatly on the market for corporate control. Where this is quite restricted and managers need not be so concerned about share prices as they have become in some capital market based financial systems, the impact of investor internationalisation on these kinds of dominant competition models is likely to be limited.

The growth of managerial coordination and control of economic activities across national borders has also enhanced many of the conditions supporting Fordist strategies. While this is partly because MNCs are able to access low cost labour and other resources in different market economies, it also reflects their variable, and often

limited, integration with particular national and regional governance arrangements. As firms with facilities in different economies, MNCs are more able to opt out, or at least distance themselves from, local associations, collective agreements and other nationally specific coordination processes that restrain short term economic opportunism. Increasing cross-national economic integration through organisational routines is likely, then, to reduce the ability of national trade associations and similar bodies to organise markets collectively and sanction free riding behaviour, thus limiting longer term collaboration between companies and support for investment in collective competition goods.

Such international integration does also, though, enable firms to acquire and manage directly strategic assets located in different parts of the world, particularly highly skilled technologists and researchers, and where these are highly interdependent with local governance arrangements, foreign MNCs are likely to follow them. The more they invest abroad in order to acquire and/or control such assets, as distinct from gaining market access or reducing input costs, the more they can be expected to become embedded in national and regional coordination mechanisms and cooperate with business partners where this is institutionalised.

Additionally, of course, if host economies are large, rich and highly significant for MNCs, and their dominant institutional arrangements are both mutually supportive and strongly entrenched in dominant political-economic coalitions, the ability of foreign firms to change established patterns of collective organisation will be quite limited, as many MNCs have found in postwar Japan. In general, the more MNCs seek to integrated strategic assets in economies where those assets gain much of their value from particular governance patterns and institutions, the more they are likely to adapt to, and perhaps reinforce, those patterns.

While, then, the internationalisation of many economic activities may have reduced the cohesion and effectiveness of regional and national institutions supporting incremental quality improvements through employer-employee commitment, it has also created more possibilities for firms to reach larger markets, reduce costs and respond more flexibly to demand changes while maintaining some collaborative relations with domestic business partners and cooperating with foreign ones. To an extent, the loosening of domestic commitments seems to be partially compensated by their extension abroad and greater flexibility to alter suppliers while improving their capabilities.

The collapse of the Soviet Union and opening of many state socialist economies to foreign firms, both as exporters and as strategic investors, have greatly enlarged markets for many goods and services, although these vary in their segmentation by taste, income and education. In the case of industrialising economies, they also have greatly increased the availability of unskilled and low cost labour for MNCs, as well as facilitating access to more highly skilled labour in Russia and the other more industrialised state socialist societies. Since there are few institutional constraints on short-term opportunistic behaviour in many of these developing market economies, price-based competition is dominant and the large supply of unskilled labour in those still industrialising facilitates rapid adjustment to demand changes through numerical flexibility. To some extent, this has probably weakened the power of labour unions

organising lower skilled workers in many OECD countries, but, as the examples of Denmark and other Nordic countries indicate, need not always lead to a decline in the effectiveness of corporatist institutions or an increase in managers' control of work processes (Kristensen, 2009).

Many of these changes and their likely effects have been facilitated by the large number of innovations in information and communication technologies that have been introduced and widely diffused since the end of the Second World War. As well as greatly reducing the cost of communicating over large distances, these have enhanced the codification of knowledge and data such that they can be circulated at high speed to large numbers of people and so enable the cheap and fast coordination of activities in a wide range of locations.

As Tylecote and Visintin (2008: 228-233) have suggested, the new ICT paradigm is helping to drive international economic integration by facilitating the coordination of activities in capital and labour markets around the world. In particular, the increasing digitalisation of information and codification of knowledge enables firms to communicate more effectively with suppliers and customers across large distances, and so be able to access a wider range of business partners at low cost through electronic data interchange (EDI) and similar technologies.

Insofar as this means that they can standardise their requirements and formalise their contracting procedures, it may facilitate the fast switching of suppliers, and so encourage more arm's length contracting across the world and modularisation of production processes, as in many buyer dominated commodity chains (Bair, 2005; Gereffi et al., 1994) and some service sectors such as banking, IT problem solving and legal contracting. As well, then, as enabling firms to reach mass international markets by reducing coordination costs, ICT innovations can facilitate rapid adjustments to changing markets through reorganising supply chains, as we have seen in the electronics industry in Pacific Asia (Ernst, 2006; Sturgeon, 2002).

However, such technologies can also increase the mutual dependence and integration of customers and suppliers, especially in industries where integrated product architectures limit the degree of modularisation of production chains that is feasible (Chesbrough, 2003). Especially where quality improvements are dependent on both continually upgrading complex assembly processes and integrating these with component supplies, as in much of the car industry, arm's length contracting for key inputs has become less feasible and many firms are using the new technologies to achieve closer integration with their major suppliers around the world (Herrigel and Zeitlin, 2009; MacDuffie and Helper, 2006).

Indeed, the ability of new ICT to reduce coordination costs and integrate economic activities carried out in different labour markets can facilitate international learning and innovation by SMEs, as Kristensen et al (2009) have found in Denmark. Rather than simply using such technologies to reduce input costs and control suppliers' operations at a distance, as many US firms appear to do, some Danish companies are working with their business partners in low cost economies to improve performance and seize opportunities jointly. In some cases, this involves skilled workers and technicians from Denmark helping to train and develop staff in their supplying firms. While this may be

an unusual phenomenon deriving from the Danish institutionalisation of training and continuous skill enhancement as the dominant means through which workers and firms compete in providing high quality goods and services for specific customers, it does show how internationalisation and the development of ICT can facilitate high quality and flexible competition models rather than always supporting Fordist ones.

The extent to which such integration of key tasks leads to risk sharing and mutual trust more generally remains highly variable, though, as MacDuffie and Helper point out (2006: 428-456). Close collaboration and technology sharing between large assemblers and their suppliers on operational matters such as design and engineering can be quite high without necessarily implying that the purchasing regime is equally cooperative and mutually trusting. A similar distinction between operational collaboration and strategic or governance cooperation was found in a study of customer-supplier relations at a British airport where the airport authority, baggage handling companies, airlines and air traffic control agencies were forced to work closely together on day to day tasks but were much more adversarial and antagonistic in their strategic dealings with each other (Lelievre-Finch, 2008). It is a mistake, then, to assume that increasing international customer-supplier cooperation and information sharing on task matters automatically means closer trust on governance matters. These latter seem much more affected by institutional constraints and what MacDuffie and Helper (2006: 453) term "legacy modes of exchange", i.e. effective practices that have largely been developed in firms' domestic environments.

Similarly, these technological changes can have a variety of different consequences for firms' internal structures and work systems. On the one hand, they can greatly improve the flow of codified knowledge throughout an organisation, thus reducing the number of employees processing information and facilitating managerial control over work processes, the flow of materials and performance outcomes. Integrating computer-aided design with computer-aided manufacturing and other functions reduces coordination costs and can speed up product development and production. Additionally, microelectronic control systems and similar innovations have increased the flexibility of production lines in many industries so that smaller batch volumes have become viable and product changeovers made cheaper and quicker.

On the other hand, they can also be used to enhance skilled workers' abilities and integrate planning and execution activities on the shop floor, which enables faster responses to market and technical changes and greater employee involvement in problem solving and business development activities (Kristensen, 1992; 2009; Sorge, 1991; Sorge and Warner, 1986). This depends considerably, of course, on the availability and level of skills amongst employees and the strength of institutions encouraging collaboration between managers and workers and the adoption of quality focused competition models.

Turning finally to consider how the impact of sustained economic growth and expansion of education and public science systems in most OECD economies since the end of the Second World War, these have tended to increase demand for higher quality, more differentiated goods and services and generating a more technically competent workforce, including those capable of contributing to formal scientific and technological knowledge (Boyer, 2004; Boyer and Durand, 1997). This workforce will

find it easier to adapt to new technologies and work processes without needing detailed supervision and limit the degree of managerial direction of task performance.

The combination of growth in higher education and support for public scientific research expands the labour force capable of both producing new formal knowledge and understanding how this could be used for innovative purposes. In principle, then, these collective investments in most OECD countries should facilitate competitive strategies based on radical, discontinuous innovations. However, as the numerous studies of Silicon Valley and other regional innovation systems have shown, although such expansion may well be an important, if not necessary, condition for the success of these kinds of competition models, it is by no means sufficient. Its effectiveness in generating similar patterns of innovation is highly dependent on other contextual factors, such as the nature of dominant labour market institutions, the organisation of public science systems, and the provision of other collective competition goods (Asheim and Gertler, 2005; Casper, 2007; Mowery and Sampal, 2005; Whitley, 2003)

### **Changing Competition Models**

In the light of these expected connections between the increasing internationalisation of economic activities, geopolitical shifts, ICT innovations and the growth of incomes, higher education and the public sciences and the conditions supporting different competition models, what can be concluded about the development of established competition models and dominant economic logics in differently organised economies? In table 4 I summarise the likely consequences of these changes for the seven ideal types identified earlier, and will now consider these in more detail

#### **TABLE 4 ABOUT HERE**

In the case of the two price-based strategies of Fordism and opportunism, these continue to be supported by the international expansion of mass markets for standardised goods and services and the increasing ease of coordinating development, production and marketing across labour and product markets through ICT. This is especially so where much information and knowledge is readily codified and processes can be decomposed into modular components, as in many parts of the electronics industry. While Fordism may, then, have declined considerably as a nationally dominant economic logic in richer societies as markets become saturated and tastes change, it has grown in international significance and continues to constrain the pursuit of more quality-focused strategies by limiting price levels.

In many service sector activities, these changes have further encouraged the internationalisation and standardisation of service provision, especially where states have deregulated market entry and reduced legal constraints on competitive behaviour. Recently, such mass production of services has become extended to some of the established professions as well as knowledge intensive business services (Miozzo and Grimshaw, 2006), and can be seen as the broadening of Fordist models to novel areas of economic activity.

Similarly, we would expect the increased internationalisation of markets, use of ICT to reduce coordination costs and modularisation of value chains to encourage



opportunistic competition models in labour intensive sectors. However, the ease of entry to many buyer driven commodity chains and focus on low prices mean that firms are always vulnerable to new competitors from lower cost economies. Additionally, when income levels rise and demand in the richer countries becomes saturated and differentiated, purely price-driven competition models may become less viable for those markets.

The combination of such international competition based on price and increasing flexibility of both quality-based large batch production and more customised outputs seems likely to put considerable pressure on traditional craft competition models, especially where these depended on highly paid skilled workers in markets that were relatively protected from foreign competition. As it becomes easier for large firms to reduce input costs through international sourcing and to differentiate product ranges more in response to changing customer demands by using ICT to increase the flexibility of production processes, they can threaten smaller companies more reliant on local markets and incrementally upgraded skills. In some of the traditional professions, such as accountancy and law, these changes have encouraged the standardisation and internationalisation of some activities, as well as increasing cross-national coordination between organisations and, in some cases, mergers (Morgan and Quack, 2005).

One way of dealing with such intensified competition in some Italian industrial districts has been for SMEs to move their more routine operations to low cost countries such as China and/or buy in simpler components from there (Bellandi and Caloffi, 2008), just as some Chinese firms are establishing units in Italy to be able to label their products as being "Made in Italy". The management of such international integration has been facilitated by institutionalised collaboration patterns and the local provision of collective competition goods in Germany and Italy (Herrigel and Zeitlin, 2009).

An additional response of SMEs reliant on highly paid, highly skilled workers to produce limited production runs of high quality goods for demanding customers to this situation is to invest - or encourage employees to invest - considerable time and energy in further training and skill enhancement to the extent that they change the nature of their capabilities over time. According to Kristensen et al (2009), this is what many Danish companies and workers have done to improve continuously the products and services they provide. By upgrading and extending their technical knowledge and skills, they become able to offer new kinds of competences to their customers and so adopt more of a flexible customised competition model than a craft one.

Rather than solving similar kinds of problems with relatively stable skills and knowledge, as in many established professions, such continuing training enables firms to extend their services to deal with new problems and concerns of their customers, as in many flexible project teams in organisations that resemble more Mintzberg's adhocracies (1983). . This does, though, depend greatly on the wide availability of such training at low cost and, at least in the case of Denmark, has been supported by considerable levels of social protection that enable workers and firms to experiment with new ways of working (Kristensen, 2009).

More generally, flexible customised competition models are encouraged by most of these changes to the business environment by enlarging the number of potential customers for specialised goods and services, expanding the supply of highly educated workers able to acquire new technical skills, and through using new ICT to coordinate skills and activities both within national boundaries and across them to respond quickly to changing demands. Internationalisation of product markets enables providers of high quality goods and services to increase their niches beyond national customers and operating internationally allows them to access staff from different labour markets. Cross-national project teams, for instance, are increasingly providing problem solving services in consultancy and other knowledge intensive business services (Miozzo and Grimshaw, 2006).

Similarly, while the domestic institutional context supporting DQP strategies in some economies may have been weakened by internationalisation, the combination of expanding international product markets and increasing consumer education and income levels offers firms pursuing high quality competition models a much larger market for their outputs. Additionally, by locating major production facilities in both their larger foreign markets and in lower labour cost countries, and coordinating these through managerial procedures with their domestic operations, such companies, can, at least in principle, combine DQP models with lower costs, especially where ICT innovations facilitate cross-national integration (Tylecote and Visintin, 2008).

Insofar as firms pursuing these strategies are able to maintain high levels of collective commitment to improving quality and adapting to changing patterns of demand in their domestic and some foreign facilities while taking advantage of cheaper input costs in other foreign locations, they should benefit from such internationalisation. Where product architectures are highly integrated so that modularisation is difficult, and competitiveness depends greatly on the organisational integration of problem solving and continuous improvement activities, firms facing increasing pressures to respond to foreign customers' demands, as in for example the Brazilian car industry, are investing in upgrading their suppliers' capabilities in lower cost locations so that they can become more flexible in foreign markets (Herrigel and Zeitlin, 2008; Sako, 2003).

While some MNCs may have originally intended to operate at arm's length from their new suppliers in low cost economies and focus on price reductions, as local foreign markets become more important and differentiated, many are having to develop more collaborative and responsive capabilities in their foreign operations, especially where modularisation is limited, thus in a sense extending the DQP model abroad. Flexible MPDG has, then, become more widespread, encouraged particularly by modularisation and ICT innovations, while purely domestic DQP strategies have probably been weakened by the recent changes in the business environment. Flexible MPDG models have also been encouraged by the expansion of high education and public science systems, especially where the growing number of scientists and technologists have strong incentives to work for leading companies and labour market institutions facilitate collaborative problem solving activities in the development and commercialisation of new products and technologies along current trajectories.

The combination of internationalising product and capital markets, expanding higher education and public science systems and income growth, and ICT innovations has

supported the development of discontinuous innovation competition models. Modularisation, access to large markets for new goods, growth of new formal knowledge and capabilities for commercialising it and the increasing ability of venture capitalists and other business services to support new, high risk, innovations across national boundaries help to facilitate the development of new products and industries, especially where there are few barriers to restructuring project teams and ready access to a wide variety of technical specialists.

## **Concluding Remarks**

This discussion of the likely relationships between different competition models, institutional arrangements and changes in the political-economic and technological environment suggests a number of points that are worth mentioning in conclusion. First, most of the changes considered here vary in their expected impact on firms' priorities depending on their current competition models and institutional contexts. While some do threaten quality-based models, many also offer opportunities to extend and/or modify the ways in which they follow these. In the case of product market internationalisation, for example, this both intensifies price-based competition for many companies in the richer economies, and enlarges the market for higher quality, more differentiated goods. Similarly, while the factors supporting the growth of MNCs can weaken constraints on opportunism and encourage more of a focus on price-based competitive strategies, they can also facilitate quality-focused firms obtaining low cost inputs and increasing their organisational flexibility. It is therefore unlikely that any single change has the same and unequivocal implications for all the models discussed here.

Second, the identification of national institutional regimes with a single dominant economic logic such as Fordism or DQP - which in any case varies greatly between types of regimes (Whitley, 2007) - is weakening with greater internationalisation, and many competition models now involve cross-border coordination of economic activities. Both the complementarity of dominant institutions in encouraging particular patterns of behaviour and cohesion of the major postwar interest groups within nation states is declining in many market economies, which decreases the national homogeneity of business system characteristics and economic logics. The scope for sectorally specific patterns of collaboration and competition has grown correspondingly, which is especially noticeable in the more corporatist societies as Lechevalier (2007) has highlighted in Japan.

Third, the combination of internationalisation, increasingly differentiated patterns of demand and increased rate of product innovation is encouraging many firms to respond more rapidly to changing circumstances. Adaptability in meeting customers' demands has become more important for many companies in recent decades, especially in the wealthier countries. This has intensified the need for organisational flexibility, updating skills and incorporating new knowledge quickly into new products and services. Both traditional craft and DQP models are threatened by such pressures and many companies following these models are adapting to them by outsourcing some of their more routine activities to lower cost economies as well as by investing in the improvement of their suppliers' knowledge and capabilities in such countries (Herrigel and Zeitlin, 2009; Kristensen et al., 2009).

Fourth, how firms respond to such pressures and opportunities still seems, though, to be strongly affected by their domestic environment and its conditioning of their priorities and capabilities. As Sturgeon (2007) has emphasised, while many US firms in the electronics industry embraced modularisation and outsourcing enthusiastically, both in their home economy and abroad, most Japanese ones have preferred to maintain their central design, development and manufacturing facilities in Japan, together with their established close ties to major suppliers. At least in the early 2000s, they took advantage of internationalisation opportunities by outsourcing their more routine and old generation product development and production to lower cost economies, while retaining their established patterns of collaboration and competition at home. Similarly, Takeishi and Fujimoto (2003) found that Japanese car manufacturers were less willing to attempt modularisation of their production systems than were US and some European ones.

In this large, rich and distinctively organised market economy that encourages employers and employees to invest in the continued development and improvement of firm-specific competences, then, internationalisation has not yet led to the radical change of established economic logics. While changing environments offer both opportunities and threats to established patterns of economic coordination and control, how leading firms respond to these remains strongly influenced by their established capabilities and the context in which they developed and continue to be reproduced.

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**TABLE 1**

**Ideal Types of Competition Models**

<b>Dominant Basis of Competition</b>						
		<b>Reducing Costs and Prices</b>	<b>Improving Quality and Functions</b>			
<b>Volumes of Standardised Outputs</b>	Low	Low cost, small batch production with cheap labour that becomes uncompetitive once large volume factory production develops	Craft and traditional professional production	Low to Medium	<b>Flexibility and Speed of Response to Market and Technical Change</b>	
			Flexible Customised Production of goods and services	High		
	Medium to High	Fordism	Diversified Quality Production	Low to medium		
			Opportunism	Flexible Mass Production of Differentiated Goods and Services		High
				Discontinuous Innovation		

**TABLE 2**  
**Conditions Supporting the Dominance of Competitive Models**  
**Competition Models**

<b>Conditions</b>	<b>Fordism</b>	<b>Opportunistic</b>	<b>Craft Production</b>	<b>Flexible Customised Production</b>	<b>Diversified Quality Production</b>	<b>Flexible MPDG</b>	<b>Discontinuous Innovation</b>
Product Market Size and Differentiation	Mass, undifferentiated	Large, price/fashion focused	Niche, quality focused	Niche, quality focused	Large, differentiated and quality focused	Large, differentiated and quality focused	Large, price and/or quality focused
Constraints on short term opportunism	Low	Low	High	Medium	High	High	Low
Availability of knowledgeable risk capital	Low	Low	Low	Low	Low	Low	High
Supply of technical specialists	High	Low	Low	High	High	High	High
Availability of new technical knowledge	Low	Low	Low	Medium	Medium	High	High
Modularisation	Medium	High	Low	Medium	Low	High	High

**Table 3**

**Effects of the Changing Business Environment on Conditions Affecting Competition Models**

**Changing Features of the Business Environment**

<b>Conditions</b>	Product Market Internationalisation	Capital Market Internationalisation	Internationalisation of Organisational Integration	Collapse of State Socialism	ICT Innovations	Increasing Consumer Incomes	Expansion of Higher Education and Public Science Systems
Product Markets	Increased in size			Increased in size	Increased access	Increased	differentiation of demand
Constraints on Opportunism	Reduced	Reduced by high levels of foreign portfolio investment	Reduced, except where strategic assets are dependent on longer-term commitments		Reduced when they facilitate access to foreign locations		
Availability of Risk Capital		Increased					Increased supply of knowledgeable venture capitalists
Supply of Technical Specialists			Increased	Increased in industrialised societies	Increased access to them		Increased
Availability of New Technical Knowledge			Increased		Increased access		Increased
Modularisation					Increased, except where product architectures are integrated		Increased where new knowledge increases digitalisation

**TABLE 4**  
**Expected Effects of the Changing Business Environment on Established Competition Models**

<b>Changing Business Environment</b>	<b>Established Competition Models</b>						<b>Discontinuous Innovation</b>
	Fordism	Opportunism	Craft Production	Flexible Customised Production	DQP	Flexible MPDG	
Internationalisation	Supported by expansion of markets for standardised goods and supply of cheap labour	Supported by opening of product markets to low cost producers	Threatened by Intensification of price competition, supported by access to low cost inputs, especially in collaborative institutional regimes	Supported by growth of niche markets and access to skilled labour, where training is available	Supported by growth of niche markets and access to reduced cost inputs in modularised sectors, but threatened by weakened constraints on opportunism, price competition from low cost economies and demands for faster responsiveness		Supported by growth of markets for new products, internationalisation of venture capital and access to strategic assets
Collapse of state socialism							
ICT Innovations	Supported by facilitating international integration		Supported by enabling outsourcing	Supported by modularisation cross national integration of activities	Supported by Increasing production flexibility but threatened by ease of outsourcing	Supported by facilitation of organisational flexibility, internationalisation, and modularisation	Supported by modularisation and ease of cross-national coordination
Income Growth, Expansion of Higher Education, and Public Sciences	Decline in wealthier markets	Limited to fashion goods	Supported by market growth for high quality, customised goods but threatened by new technologies	Supported by growth of highly skilled labour and new technologies where labour markets are fluid	Supported by market growth for quality goods but threatened by new technologies	Supported by increase in technologists and market growth	Supported by market growth, production of new formal knowledge and technologists, especially labour markets are fluid.

