

**Changing Competition Models: The effects of internationalisation,
technological change and academic expansion on dominant economic logics**

by

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Introduction

Many of the comparative analyses of economic organisation and development conducted in the second half of the 20th century have focused on identifying distinctive complexes of firm governance, growth strategies and coordination processes that became established in different societies (e.g., Amable, 2003; Hall and Soskice, 2001; Hollingsworth and Boyer, 1997b). These systems typically combined particular institutional arrangements with dominant types of firms and business strategies to constitute relatively coherent wholes that characterised particular economies in certain historical periods or, in some accounts, dominated entire epochs of capitalism. A central concern of these analyses of competing capitalisms has been to show how the dominant institutions governing 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).

Such institutional regimes were sometimes assumed to be so nationally pervasive and integrated that they generated common patterns of economic action and outcomes within each country. These patterns have been seen to be so path dependent that only major exogenous shocks could be expected to change them (Deeg and Jackson, 2007; Morgan, 2005; Streeck and Thelen, 2005). However, the belief that dominant institutions governing economic activities in a particular market economy lead to the establishment of specific kinds of economic actors with distinctive collective capabilities and strategies need not imply that such institutions are always mutually reinforcing or that they constrain all leading firms to follow the same competitive approach. Rather, 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).

Furthermore, it is important to distinguish between the relatively cohesive and systemic nature of ideal type constructions, on the one hand, and the often complicated and contradictory nature of empirical socio-economic formations, on the other hand. In order to explain how the latter manifest distinctive patterns of economic organisation and performance, it is useful to contrast their central characteristics with those of ideal types that imply particular competitive logics of action so that the key similarities and differences accounting for specific outcomes can be identified. Given that any concrete market economy combines features of different ideal types, no single causal process determines results, but some are more dominant than others in particular circumstances and can provide explanations of them. Ideal types, then, have to be systemic and coherent in their implications for social actions so that the conditions under which specific causal processes operate can be clearly identified and their outcomes explored (Rule, 1997).

As well as ideal types being important for comparing the role of institutional variations in generating different kinds of competitive strategies, or economic logics of action, and identifying coherent systems of economic coordination and control that can be expected to have contrasting results, they also help us to understand socio-economic change. This can be illustrated by considering the relationships between institutional regimes, dominant competitive models or logics of action and performance outcomes in different kinds of market economies. In particular, identifying the conditions under which different kinds of business strategies are likely to be developed by leading companies in differently organised socio-economic systems enables us to suggest how these might change as contexts alter.

If, for instance, Fordism relies 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 render the Fordist model less effective. Similarly, removing barriers to entry by large firms and reducing trust between small firms in coordinated industrial districts are likely to weaken some of the key conditions supporting their effectiveness and could destroy their economic viability (Crouch et al., 2001; 2004; Friedman, 1988).

It is important here to distinguish between the conditions encouraging particular kinds of competitive models to become dominant in an industry or economy and the varied institutional arrangements that contribute fulfilling these conditions. As Boyer (1988) has emphasised, different institutions can have similar consequences and particular kinds of changes can have different effects in contrasting circumstances, as the so-called "big bang" financial deregulation efforts did in London and Tokyo (Laurence, 2001). In general, then, changes in particular institutions, such as those governing labour markets, can affect the key supporting or inhibiting conditions affecting strategic choices differently, and so have contrasting outcomes (Rule, 1997).

These points suggest that if we are to understand how recent changes in the business environment are affecting the different kinds of economic logics followed by leading firms in differently organised market economies, and the roles of dominant institutions in encouraging such logics, we need to identify: a) the major ways in which they differ, b) the conditions supporting or inhibiting their establishment, and c) the likely impact of recent institutional, market and technological changes on these conditions and so on prevalent economic logics.

In this paper, I outline a framework for analysing how some of the key changes in the business environment that have become widespread since the collapse of the Bretton Woods system have affected, and are continuing to influence, the central conditions encouraging companies to pursue particular kinds of economic logics, and altered their prevalence and nature in different contexts as a result. First, I present a taxonomy of seven ideal types of competition models that resemble many of the dominant logics identified in comparative studies of 20th century capitalisms, such as Fordism, DQP and radical innovation, and then suggest how different kinds of conditions seem likely to encourage firms to follow these strategies. 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 suggest how they can be expected to alter these conditions and so affect dominant competition models.

Types of Competition Models

Much of the discussion of 20th century capitalisms has focused on the rise of Fordism and its alternatives. While few accounts of the mass production-mass consumption "paradigm" (Freeman and Louca, 2001: 273-277) agree on all of its features, most agree with Hirst and Zeitlin (1997:221) that this kind of mass production "can be defined as the manufacture of standardised products in high volumes using special purpose machinery and predominantly unskilled labour." For investment in this kind of specialised manufacturing paradigm to be justified and continued, market demand needs to be reliably large and so the Fordist

economic logic typically incorporates mass markets dominated by large oligopolistic enterprises as well as mass production.

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. Again, though, most accounts can be seen to agree that it typically includes small batch production of largely customised goods made with flexible general-purpose machinery by skilled workers. Thus, batch size, standardisation and homogeneity of outputs, specialisation of machinery and the skill levels of production workers are often taken to be the differentiating features of these ideal types of 20th century production systems that have to be combined with demand differentiation and predictability to constitute more general kinds of economic logics of competition and accumulation.

In their account of different social systems of production, Hollingsworth and Boyer (1997a) suggest that three key dimensions for comparing such ideal types are volume of production, the basis of competition and the flexibility or speed of adjustment to market and technical changes. They combine these to characterise four distinct alternatives to Fordist mass production: 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 economic logics 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. Here, I have dichotomised the three dimensions into 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.

TABLE 1 ABOUT HERE

Two of these, *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 market. Fordism in this case is therefore more than the pursuit of low costs and prices through standardisation and routinisation of production. It involves 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 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 (1992) 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).

While opportunistic production shares many of these characteristics, it is distinguished from Fordism by its ability to shift production between product lines relatively quickly and adapt 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 responsiveness to changes in customer needs in its major markets that are often some distance away.

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, the key competences 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 Fordist type strategies can usually dominate small scale producers unless the latter are institutionally protected from predatory pricing by large firms. 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 created 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 responsiveness on the other hand. *Craft* production combines small batch production by highly skilled workers with considerable customisation and ability to respond to 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 established professions and some project based firms (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. In sectors such as 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 professional and craft production systems typically segment tasks and problems around established skills, 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 *moiré* 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.

Diversified quality production is similarly differentiated from *flexible mass production of differentiated goods* and services (*Flexible MPDG*) by the faster responsiveness of the latter. They are both more flexible than Fordism in adapting their product lines for changing consumer tastes as well as improving production processes on a continuing basis with technological innovations adopted, and sometimes jointly developed, by skilled workers. Flexible MPDG is, though, more able to restructure production and incorporate technical changes into 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 and adapt new knowledge quickly for product development and marketing.

Such innovation is often facilitated by flexible supply chains in which first tier suppliers share some of the risks and contribute to problem solving in a more cooperative and mutually supportive set of inter-firm relations than is typically found in Fordist models. In addition to internal coordination being a key managerial competence in these systems, then, the ability to integrate supply chains on a continuing basis is a crucial collective capability, as Cawson (1994) found in the consumer electronics industry.

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, 1998).

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 sectors, regions and countries as a result of variations in market conditions, technological regimes 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 can, then, be summarised as nine dimensions. First, the size of product markets and their differentiation by taste, income levels and preferences for high quality goods and services. Second, the extent to which employers are able and willing to adjust activity levels to market changes through hiring and firing employees, or numerical flexibility. Third, the extent to which employers are encouraged to work with employees to make such adjustments to market and technical changes through training, task rotation, work reorganisation and similar measures ensuring functional flexibility. Fourth, the large scale availability of unskilled workers with few constraints on how they are employed. Fifth, the level of institutional constraints on short-term economic opportunism, market entry and exit, and restructuring organisations. Sixth, the availability of knowledgeable risk capital. Seventh, the supply and ready availability of high skilled technical specialists. Eighth, the extent to which companies are able to gain access to new scientific and technical knowledge relatively quickly. Ninth, 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 nine conditions support their institutionalisation, distinguishing between: low, limited, medium, considerable 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 in employment are obviously facilitated by flexible labour markets in which 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. Thus, a ready supply of easily trained operatives who can be sacked at low cost in the event of demand changes is a necessary condition for Fordist competition models to become dominant.

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 short term opportunism is constrained and companies are limited in their freedom to dominant 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 coordination mass production with mass marketing activities. As Chandler (1977; 1998) 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. A necessary condition for the dominance of Fordist models, then, is a ready supply of competent staff to design and implement such mechanisms who remain committed their employers' success, develop firm specific skills and knowledge and are unlikely to leave for competitors or to start their own business in the short term.

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 constraints on how they do so. A large supply of unskilled labour coupled with a limited supply of skilled workers who are weakly organised, as well as easy access to specialised production machinery are also key conditions. In addition, few institutional 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 the supply of unskilled workers, few constraints on short term economic opportunism and 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.

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 a number of conditions. First, a ready supply of highly skilled and flexible workers who are able and willing to adapt to changing market and technical circumstances by improving firms' competences and developing new ways of working. Second, a coordination system that can integrate inputs and outputs flexibly and at relatively low cost, as well as enabling firms to market and distribute their goods to customers willing to pay for high quality and specialised outputs. In the cases of some industrial districts such a system has been supported by local institutions providing what Crouch et al (2001; 2004) have termed collective competition goods. Third, some barriers to short term opportunism that prevent large firms from predatory pricing and taking over successful SMEs with their skilled workers.

For Japanese machine tool firms in Sakaki township in the 1980s, these barriers were sustained by the local provision of substantial collective competition goods by the Chamber of Commerce 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; 2004; Kristensen, 1992; 1996).

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 routinise major parts of the production process. Work intensity, however, remains quite high in such models, together with job satisfaction (Kristensen et al., 2008; 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. High 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.

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.

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 (Lindberg and Campbell, 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. In the case of Japanese companies, though, this seems to have been restricted to the more commoditised parts of the production system according to Sturgeon (2007).

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, 1997; 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 a number of significant changes in the institutional, technological and macro-economic contexts of business activities since the collapse of the Bretton Woods system. Five main sets of changes resulting from a range of factors, including shifting alliances amongst interest groups and state policy reforms, have been particularly important. 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, 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). This, we should not expect the impact of, say, capital market deregulation and internationalisation to be the same in differently organised societies such as France and Germany, or even those that are supposed to share a common competition model such as DQP in Germany and Japan. 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., and will now discuss them further.

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. However, the specific effects of each kind of internationalisation can vary between societies. 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., 2008).

The internationalisation of capital markets has likewise reduced the ability of financial and business elites to coordinate their activities and limit opportunism in many countries, 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 biotechnology companies (de Paauw, 2009).

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 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, then, 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.

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. 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, 2008).

Many of the 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 number s 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 (Gereffi et al., 1994). 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 (2008) 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; 2008; 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 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.

It should also be pointed out here that some states have additionally invested considerably in the expansion of technical training facilities and encourage both employers and employees to invest in continual skill enhancement and "employability". In relatively fluid labour markets, this encourages flexibility and innovation in work processes and organisation as firms and staff seeks to improve their competitiveness in providing high quality goods and services for demanding customers (Kristensen et al., 2008). In these contexts, purely price-based competition in mass markets becomes less effective as a competitive strategy as disposable incomes rise, markets become saturated and consumers seek more variety. Equally, the availability of domestic unskilled labour declines as education standards improve, although this does of course vary between countries and depends on immigration policies.

The expansion of public science systems and qualified researchers has greatly increased the amount of new formal knowledge of physical, biological and social phenomena produced and facilitated its transformation into products and services. It therefore can lead to an increase in the number of innovations based on formal knowledge - including of course those contributing to ICT - and in the rate at which these are diffused. Depending on the broader context in which formal knowledge is generated and used by different actors - that is, the nature of the public science and innovation system in different countries and regions (Edquist, 2005; Whitley, 2003, 2007), this expansion can encourage the development of discontinuous innovations and new industries based on them (Casper, 2007).

Changing Competition Models

Given these expected changes in the conditions supporting the adoption of different competition models, what are the likely implications for firms' strategies in different kinds of market economies? In particular, how are those focused on particular combinations of price/quality competition, volume sizes and flexibility as a result of being successful in distinctive domestic institutional contexts likely to change? In table 4 I suggest how the changes outlined above can be expected to alter the key components of the seven competition models summarised earlier, and will now consider these relationships in more detail

TABLE 4 ABOUT HERE

Considering first the internationalisation of product markets, this intensifies competition in domestic markets - often based on price - but also enlarges the potential demand for both mass-produced standardised goods and more differentiated and higher quality products. While enabling firms following the Fordist model in wealthier countries where consumers are becoming more concerned with quality than price to reach new mass markets for standardised products abroad, such internationalisation also enables companies making more customised and higher quality goods to expand their customer base beyond their domestic borders.

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.

Capital market internationalisation has commonly been seen as encouraging arm's length and low commitment relationships between investors, managers and employees through fragmenting share ownership amongst a wide variety of international investors who are primarily concerned with portfolio returns. Such fragmentation weakens investor commitment to, and knowledge of, individual companies and pressures managers to increase short-term returns at the expense of investing in the development of organisational capabilities. As Tylecote and Visintin (2008) have emphasised, arm's length financial systems tend to discourage long term investments in process and product improvements that are invisible to outside investors, and constrains the pursuit of quality based competition reliant on continuing worker commitment to, and involvement in, firm specific problem solving and capability enhancement. By encouraging firms to focus on short-term "shareholder value" goals, they can restrict commitment to skilled workers that encourages them to improve the quality of products and processes in favour of cutting costs and prices by switching suppliers and relocating operations to cheaper labour markets.

However, quality based competition is often focused on innovations in the development and production of components rather than the assembly of consumer products, as in many parts of the electronics industry, and these can be more visible to external investors through patents and other means of limiting appropriability risks (*ibid*: 45-47). While incremental process improvement can still provide significant competitive advantages in such industries - as in semiconductor manufacture - the importance of technological innovations for future profits and their more public nature mean that knowledgeable investors can remain willing to provide risk capital on a portfolio basis, often across national boundaries. Thus, the internationalisation of capital markets can encourage both visible cost reduction strategies and the rapid development and commercialisation of technical innovations, which may enhance the quality of goods and services as well as radically changing markets.

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 dominant competition models is likely to be limited.

The connections between organisational internationalisation and change to competition models are similarly varied and dependent on institutional contexts. While often portrayed as facilitating cost reduction strategies by moving production activities from high labour cost countries to cheaper ones, the expansion of MNCs has more recently come to be seen as also enabling firms to acquire strategic assets and skills that improve their innovative capabilities and develop new kinds of competences. Additionally, as emphasised by Herrigel and Zeitlin (2009), moving operations to, and recruiting new suppliers in, low cost locations can often involve MNCs investing in upgrading the skills and knowledge of local business partners to ensure quality standards continue to be met.

While, then, such internationalisation can reduce a firm's interdependence with domestic institutions and business partners, thus enabling it to reduce local commitments and develop more arm's length relationships with suppliers, employees and customers, it need not necessarily lead to the pursuit of primarily price based competitive strategies and more homogenous outputs. Where production chains can be modularised and the more routinised processes located in low cost economies, MNCs focusing on quality and innovation based competition models can combine the advantages gained from their domestically-supported competences with lower costs for some assembly operations, as arguably has happened in parts of the electronics industry (Sturgeon, 2007). In these kinds of industries, then, internationalisation can support DQP strategies for companies with strong domestic capabilities in product development and improvement.

Where, on the other hand, product architectures are more integrated and quality improvements depend more on firm-specific final assembly skills and knowledge, such hybrid organisations may be less easy to develop and maintain. This might help to explain the slower rate of organisational internationalisation of many car companies from more collaborative environments compared to their compatriots in the electronics industry. One response, of course, has been for the large assemblers to encourage their domestic business partners to internationalise with them so that the advantages of knowledge and technology sharing with established suppliers and customers can be maintained, but with lower labour costs.

Another is to invest in closer ties with major suppliers in foreign markets to ensure continued quality while sharing risks. While this involves greater costs and commitments to local partners, it can also facilitate responsiveness to foreign market changes while maintaining quality standards (Herrigel and Zeitlin, 2009). It does, however, depend on the MNC being able to ensure continuing local compliance and commitment, which may be difficult in highly particularistic environments where there are few institutional supports for longer-term cooperation and local companies and skilled workers have alternative economic opportunities (Whitley, 2007).

The other major aspect of organisational internationalisation that affects dominant competition models concerns the impact of inward FDI on collaborative institutional contexts that support quality-based competition models. This has of course been extensively discussed in analyses of how the stereotyped coordinated market economies of Germany and Japan are changing in response to globalisation (e.g. Yamamura and Streeck, 2003). As more foreign firms with varied ways of managing inter-firm relationships establish

subsidiaries in these kinds of business environments, the ability of domestic institutional arrangements to restrict opportunistic behaviour is likely to decline since these companies are not as constrained by host economy interests and alliances. Depending on the size and attractiveness of the market for high quality goods and services, as well as the cohesion and strength of dominant institutions encouraging commitment between investors, managers and employees, large-scale foreign investment in such societies can, then, substantially weaken the conditions supporting DQP strategies.

Overall, then, the cohesion and effectiveness of regional and national institutions supporting incremental quality improvements through employer-employee commitment may have been reduced by the internationalisation of many economic activities, particularly with regard to their limitation of short term opportunism. However, it has also created more possibilities for some 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, in some industries, greater flexibility to alter suppliers while improving their capabilities.

The collapse of the Soviet Union and increasing integration of other state socialist regimes into the world market economy have enlarged both the market for many mass produced consumer goods and the supply of relatively cheap labour. They therefore support the expansion of Fordist strategies and firms focused on cost reduction. Together with the new ICT reducing coordination costs, they additionally increase the number of firms in low labour cost economies competing on price and flexibility in global commodity chains (Bair, 2005; Gereffi et al., 1994). 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. Overall, then, these changes seem likely to intensify price-based competition and the rapidity of responses to shifts in consumer tastes.

Just as internationalisation can both threaten established patterns of economic organisation and commitment and provide opportunities for producers of high quality, incrementally improving goods and services, so too ICT innovations can have quite different effects on competition models in different industries and institutional contexts. While facilitating cross-national coordination of economic activities and the modularisation of engineering and production, and so supporting cost reduction through switching suppliers in low wage economies as well as relocating facilities, they also enable firms to enhance workers' skills, integrate design, engineering and production and respond more quickly to changing customer needs. They additionally support the integration of activities carried out by highly skilled R&D staff in one location with engineering and production in other ones, thus improving innovative capabilities and companies' abilities to transform new formal knowledge into new products and services. They can, therefore, increase flexibility and responsiveness to customers, enable firms to pursue both price and quality-based competition strategies, and facilitate radical innovations where dominant institutions support particular strategies and knowledge is easily codified.

Rising disposable incomes coupled with expanding higher education, on the other hand, can be expected to support more quality-focused competitive strategies and the increasing customisation of products as better-off consumers seek, and are able to pay for, more differentiated and higher quality goods and services. At least in the wealthier societies where

many consumer markets have become saturated, these developments seem likely to reduce the demand for highly standardised products, and may support radical innovation strategies by creating a larger market for novel outputs.

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)

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, what can be concluded about the development of established competition models and dominant economic logics in differently organised economies? In table 5 I summarise the likely consequences of these changes for the seven ideal types identified earlier, and will now consider these in a little more detail

TABLE 5 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.

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.

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 (2008), 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, 2008).

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. This expansion will, though, be inhibited where labour market institutions restrict entry to those with particular kinds of certified skills, as in many professional services, and discourage labour mobility.

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' compactness 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, thus in a sense extending the DQP model abroad. Flexible MPDG has, then, become more widespread, encouraged particularly by ICT innovations, while purely domestic DQP strategies have probably been weakened by the recent changes in the business environment.

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 economic logics.

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 become more responsive 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 craft production 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 costs 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., 2008).

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 lead 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

Dominant Basis of Competition					
		Reducing Costs and Prices	Improving Quality and Functions		
Volumes of Standardised Outputs	Low		Craft and Professional Production	Low to Medium	Flexibility and Speed of Response to Market and Technical Change
			Flexible Customised Production	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

Conditions	Fordism	Opportunistic	Craft Production	Flexible Customised Production	Diversified Quality Production	Flexible MPDG	Discontinuous Innovation
Product Markets	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
Numerical Flexibility	High	High	Limited	Medium	Limited	Medium	Considerable
Functional Flexibility	Low	Low	Medium	High	Considerable	High	High
Supply of unskilled workers	High	High	Low	Low	Low	Low, except in some assembly processes	Low
Constraints on short term opportunism	Low	Low	Considerable	Medium	Considerable	Medium	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

Conditions	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	Facilitate access	Encourage differentiation	
Numerical Flexibility		Encouraged by arm's length investors	Increased by investing in low commitment economies	Increased	Facilitated in modularised sectors		
Functional Flexibility		Reduced, except where the market for corporate control is restricted	Reduced, except where MNCs invest in strategic assets that depend on it		Facilitated in high commitment societies		
Supply of Unskilled Labour			Increased	Increased	Facilitated		Reduced
Constraints on Opportunism		Reduced by high levels of foreign portfolio investment	Reduced, except where strategic assets are dependent on commitment		Reduced when they facilitate access to foreign locations		
Availability of Risk Capital		Increased				Facilitated	
Supply of Technical Specialists			Increased	Increased in industrialised societies	Facilitated		Increased
Availability of New Technical Knowledge			Increased		Facilitated		Increased
Modularisation					Increased, except where product architectures are integrated		

Table 4
Expected Effects of the Changing Business Environment on Components of Competition Models

	Components of Competition Models				
Changing Business Environment	Reduce Costs and Prices	Improve quality and functions	Differentiate product ranges and customise	Respond rapidly to changing conditions	Innovate radically
Internationalisation of: Product Markets	Supported by growth of markets for standardised goods	Supported by growth of market for high quality goods	Supported by growth of market for customised goods	Supported by competition from low commitment economies	
Capital Markets	Supported by increase in portfolio investors			Supported by internationalisation of venture capital and related business services	
Organisational Integration	Supported by access to low cost inputs and weakening of constraints on price-based competition	Supported by integrating a domestic focus on quality with access to low cost inputs from abroad			
Collapse of State Socialism	Supported by growth of market for standardised goods and access to cheap labour			Supported by competition from low commitment economies	
ICT Innovations	Supported by facilitating access to cost labour and switching suppliers	Supported by enhancing skills and facilitating integration of new knowledge	Supported by reducing minimum efficient batch sizes	Supported by facilitating modularisation Supported	
Income Growth		Supported by increased in wealthier, educated consumers			
Expansion of Higher Education					Supported by growth of scientists and engineers
Expansion of Public Science System					Supported by expansion of new formal knowledge

Table 5
Expected Effects of the Changing Business Environment on Established Competition Models

Changing Business Environment	Established Competition Models						Discontinuous Innovation
	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.

