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Flexibility, Labour Utilisation, and the Global Factory

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Introduction

A growing number of global industries are experiencing significant changes in organisational and ownership structures as environmental change increases both volatility and governance options. In essence, the traditional internally owned and managed structures characteristic of international business in the 1960s and early 1970s are being eclipsed by a growing reliance on partnership or network-type structures. These organisational forms have been termed the global factory (Buckley, 2014) refining a concept first coined three decades ago (Grunwald & Flamm, 1985). The global factory describes a network of organisations providing input services for a set of products or services. These services are typically collated across national borders from organisations under different ownership, coordinated by a lead firm through the global factory network.

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While progress has been made in understanding the core principles of the global factory (Buckley, 2014) and how such systems differ from more traditional multinational enterprises (Enderwick & Buckley, 2015), there remain important elements that are poorly understood. The global factory has evolved to deal with increasing uncertainty within the global marketplace. A growing pace of innovation, new sources of competition, rising consumer expectations, and technological convergence all encourage the adoption of flexible organisational forms and strategies. When we examine the competitive advantages of the global factory, we see it is well placed to compete in a demanding global environment. Its core advantage is its cross-border coordination or 'interface competence': the ability to manage a geographically dispersed value chain. This is coupled with superior skills in governance: to know what activities should be undertaken internally and what should be outsourced. At the same time, the focal firm or lead multinational enterprise in the global factory system, has to invest in and maintain its critical firm-specific advantages in technology, branding, and supply chain management. The consumer provides focus for the global factory, with all activities directed to satisfying customer needs. It is also apparent that an implicit strength of the global factory is flexibility: the ability to survive volatility and respond rapidly to changing circumstances. Despite its obvious importance, there has been very little analysis of flexibility within the global factory model.

In response to this gap, this chapter examines the importance, role, and sources of flexibility within global factory systems. It contributes to our understanding in a number of ways. First, it examines the importance of flexibility within global factory systems, highlighting the impact of a key driver in location and governance decisions. Second, our discussion is firmly embedded in the context of the global factory, an international cross-border network of service providers differentiated by location, ownership, and purpose. We consider flexibility in broader terms than simply resource or system flexibility. We suggest that the very structure of the global factory bestows the organisation with significant advantages when pursuing a strategy of enhanced flexibility. Third, we extend existing concepts of flexibility beyond that of primarily labour market flexibility and from the level of the establishment to networks, and in particular, directed networks. Fourth, we develop a simple schematic conception of

flexibility within global factory systems that highlights the diverse forms of flexibility that are available to such organisations. Finally, the discussion highlights some of the costs of pursuing enhanced flexibility and how many of these can be mitigated through a global factory network.

The discussion is organised around five substantive sections. Following this introduction, we consider the importance of flexibility to the global factory, highlighting its centrality in managing volatility. Section three discusses the sources and forms of flexibility and the considerable literature that has developed in this area. Building on this literature, and firmly embedding our discussion within the context of the directed network, we offer a simple conception of flexibility within global factory systems. In section four, we consider some of the traditional costs associated with increased flexibility, in particular, transaction costs, conflict, commitment, learning, innovation, and the links between flexibility and firm performance. We show how the global factory is able to alleviate many of these costs. The final section offers concluding comments.

The Importance of Flexibility Within the Global Factory

Global factory structures offer a number of benefits to participant firms, particularly to the lead or focal firm. They enable the firm to specialise to undertake itself those tasks where it has clear advantage and to outsource more peripheral activities. Such specialisation should result in a more efficient utilisation of resources and enhanced opportunities to capture scale and experience advantages. In part, such specialisation should contribute towards a second benefit, lower costs of production and distribution. However, cost savings may also occur through the allocation of activities to optimal locations with access to lower-cost inputs. The global factory may also enjoy flexibility benefits over more conventionally organised rivals. We define flexibility within a global factory system to mean the ability to effectively reallocate resources and restructure processes in response to uncertainty. This raises the interesting question of why flexibility is of importance to the global factory system.

The answer lies in the reality of contemporary globalisation. The growth in globalisation has undoubtedly increased business opportunities in opening up new markets and production locations. But it has also increased interdependency and competition. This, in turn, has increased volatility. Volatility has increased within the three major market groups—financial, product, and labour. Financial and product markets have experienced growing interdependency and, financial markets at least, are highly global with shocks rapidly spreading through contagion effects. Product markets are also characterised by mounting levels of global independency bringing increased competition, new sources of competition, shorter product life cycles, and immense pressure to reduce costs. While labour markets are characterised by lower levels of global interdependency, their volatility levels have also increased. This has occurred through cross-border flows of labour (legal migration in the case of integrated regions such as the European Union [EU]), illegal migration (resulting from significant unrest in areas such as the Middle East) and the transfer of work overseas through offshore sourcing.

Higher levels of volatility are now characteristic of a wide range of tradable products and services and are apparent on both the demand and supply sides of international business activities (Buckley & Casson, 1998). On the demand side, product standardisation enhances consumer choice reducing buyer loyalty. Sellers seek to reduce such volatility through continuing innovation, branding, and the extension of brands to signal life style, as well as various lock in mechanisms such as loyalty schemes. Supply side volatility results from rapid innovation, shorter product life cycles and the need to achieve economies of scale and cost minimisation. Producers have access to a far wider range of potential suppliers as the worldwide market for market transactions (Liesch, Buckley, Simonin, & Knight, 2012) has both widened and deepened. Accessing factors in overseas locations has been facilitated by the adoption of more open market regimes as trade and investment restrictions have been relaxed (Sauvant, 2016). At the same time, technological innovations in transport and communications have facilitated the management of externally sourced transactions (Hummels, 2007; World Bank, 2009).

There have been a number of changes in the international business environment that have contributed to growing volatility. One has been

the rise of significant new competitor nations, most notably, some of the major emerging economies that have added to global competition and locational choice, marking an end to the 'Golden Age of Western Capitalism' when global production was dominated by a smaller number of enduring nations (Marglin & Schor, 1992). Some of the growth of emerging economies has been at the expense of traditional industrial powers including the USA and parts of Europe (Baldwin, 2013). Second, a number of governments seeking to improve national competitiveness have initiated policies, including liberalisation, deregulation, privatisation, and enhanced labour flexibility, that have added to global volatility through growing market interdependency. Changes in political and social attitudes towards economic power and domination have been reflected in increased internal competition within large international businesses, which have added to operational uncertainty and volatility. In the face of significant volatility, international businesses seek flexibility which contributes to resilience, the ability to absorb and adapt to shock events.

Volatility also affects structural decisions of the firm. If markets are growing strongly, sunk investments in supply or distribution facilities can be offset against rising sales volumes. Similarly, investments are unlikely to be reversed. For these reasons, the firm may be happy to internalise such activities, undertaking them under shared ownership. However, market volatility emphasises the need to seek lowest costs and increases the likelihood that some markets may need to be abandoned. In such a scenario, externalisation, pushing some of the risk onto partner organisations, both upstream (supplying inputs and products) and downstream (distribution and sales), may be the preferred option. For these reasons, volatility, the pursuit of flexibility, and growing externalisation, are all interrelated.

Sources and Forms of Flexibility

When we examine the concept of flexibility within the global factory, context is imperative. This is because the global factory is characterised by its adoption of network relationships: it is not an autonomous entity undertaking all elements of the value chain itself. It is linked into, and reliant

upon, other organisations. In addition, it has international scope and is involved in a number of national markets. These two characteristics, partial externalisation and locational diversification, may themselves contribute to flexibility. For these reasons, existing classifications of the sources of flexibility may be of limited value when applied to the global factory.

There have been a number of important efforts to identify and classify sources of organisational flexibility. Atkinson (1984) focusing on labour flexibility, highlighted the following four key forms of flexibility: functional; numerical; financial, and temporal. Functional flexibility addresses the utilisation of skills with greater flexibility resulting from cross- or multiskilling of employees. Numerical flexibility results from changes in the level of labour input, utilising part-time workers for example. Financial flexibility may be achieved by aligning payment and reward systems to achieve flexibility objectives. Temporal flexibility refers to hours worked. While useful, this taxonomy suffers from its restrictive applicability (primarily to internal employees) and its view of the organisation as a predominantly closed system. Other scholars have attempted to broaden the concept of flexibility to look at systems, particularly manufacturing and supply chain systems (Upton, 1994). This work highlights similar ideas—functional, strategic, time horizon, and hierarchical concepts—underpinning system flexibility (D'Souza & Williams, 2000; Duclos, Vokurka, & Lummus, 2003; Lummus, Duclos, & Vokurka, 2003). While these studies do extend thinking to consider system flexibility (Olhager & West, 2002), they are still of limited value when analysing the global factory. In part, this is the result of conventional classifications, for example Zhang, Vonderembse, and Lim (2003) divide flexibility along two dimensions—flexible competences—those attainable within the internal producing organisation, and flexible capabilities—those perceived by the buying organisation. While it is recognised that external flexibility is likely to have a more significant impact than internal flexibility initiatives (Jordan & Graves, 1995), such taxonomies pay scant regard to the organisational and governance complexity of the global factory.

A central theme of the firm flexibility literature is the internal separation of employees along the lines of a core and a periphery (Kalleberg, 2001). The pursuit of functional flexibility with cross-skilling and enhanced responsibilities creates a privileged group of core employees

enjoying high levels of job security and favourable employment conditions. Numerical flexibility, in contrast, produces a group of employees on less favourable employment and payment conditions whose numbers can be readily adjusted because they are part-time, temporary, or contracted through outside agencies. Core employees contribute to firm flexibility because they possess multiple skills and can be readily redeployed. Their commitment is assured because of their favourable treatment, links between pay and firm performance, as well as their increased employability that results from access to greater responsibly and development opportunities. Peripheral employees contribute to flexibility, primarily to operational flexibility, because of the ease of adjusting numbers and hours worked as well as through their engagement on less costly terms. Peripheral workers are seen as assuming some of the 'risk' of volatile markets (Jacoby, 1999).

A dilemma for the firm is the successful combination of these two forms of flexibility. Workforce segmentation with groups on contrasting employment conditions is likely to create resentment and conflict (Geary, 1992). While the concept of dualism, with a core-periphery workplace divide, is well established (Doeringer & Piore, 1971), studies of their compatibility report mixed results, ranging from a negative relationship (Cully, Woodland, O'Reilly, & Dix, 1999; Osterman, 1999) to a positive one (Morishima, 1995). One of the ways to overcome internal workforce conflict based on segmentation is the use of network relations, to externalise one group, typically peripheral employees. This is achieved through the use of subcontracting, widespread in manufacturing, and back office service activities, in a growing number of industries. Networks replace duality *within* organisations with distinction *between* organisations.

For our purposes, existing work on flexibility suffers a number of key weaknesses. First, much of it focuses on technical systems and how to optimise such systems. In a global factory where superior cross-border coordination or interface competence may be the key source of advantage, technical effectiveness is likely to be a small part of overall system optimisation.

Second, the focus of much of the flexible firm work is internal. It is based on a view that traditional hierarchical organisations, adopting Fordist pro-

duction principles, forego flexibility in the pursuit of scale and cost minimisation. Such principles of production require stable, predictable, and ideally, growing markets. Where these conditions cannot be assumed and markets are volatile, greater flexibility is desirable. From this perspective, flexibility can be achieved by internal restructuring through initiatives such as multi-skilling, job rotation, and the increased use of contract or part-time workers. In essence, flexibility can be pursued through changes in the employment terms and conditions of current resources.

Third, as discussed above, this literature pays insufficient attention to interdependencies between the various sources of flexibility. While it is recognised that enhancement in one flexibility dimension does not necessarily result in an improvement in overall system flexibility (Gupta & Somers, 1996), the diversity of potential sources of flexibility and the relationships between these, have not been fully researched. For example, attempts to inculcate both functional and numerical flexibility within the same organisation (effectively a dual labour market), is likely to lead to conflict. Spatially separating or distancing these activities, and their associated workforces, is a capability that exists within global factory systems.

Fourth, the flexible firm literature pays scant regard to the issue of how a network of collaborative firms is managed. Implicitly, the network is seen to offer mutual benefits and is coordinated through market forces. In practice, such networks are more likely to be consciously directed and this is certainly true for the global firm. The focal firm builds, directs, and manages a complex network in its own interests, part of which is the pursuit of enhanced flexibility.

Finally, any conceptualisation of flexibility within a social system as complex as the global factory needs to acknowledge the likelihood of trade-offs. Achieving greater flexibility is clearly not costless: doing so may be at the expense of other organisational dimensions, for example commitment, coordination, uncertainty, information capture, or innovation. These are relevant considerations that need to be incorporated into any meaningful analysis.

In the light of these weaknesses, we offer a conceptualisation of flexibility within the global factory system, summarised schematically in Fig. 2.1.

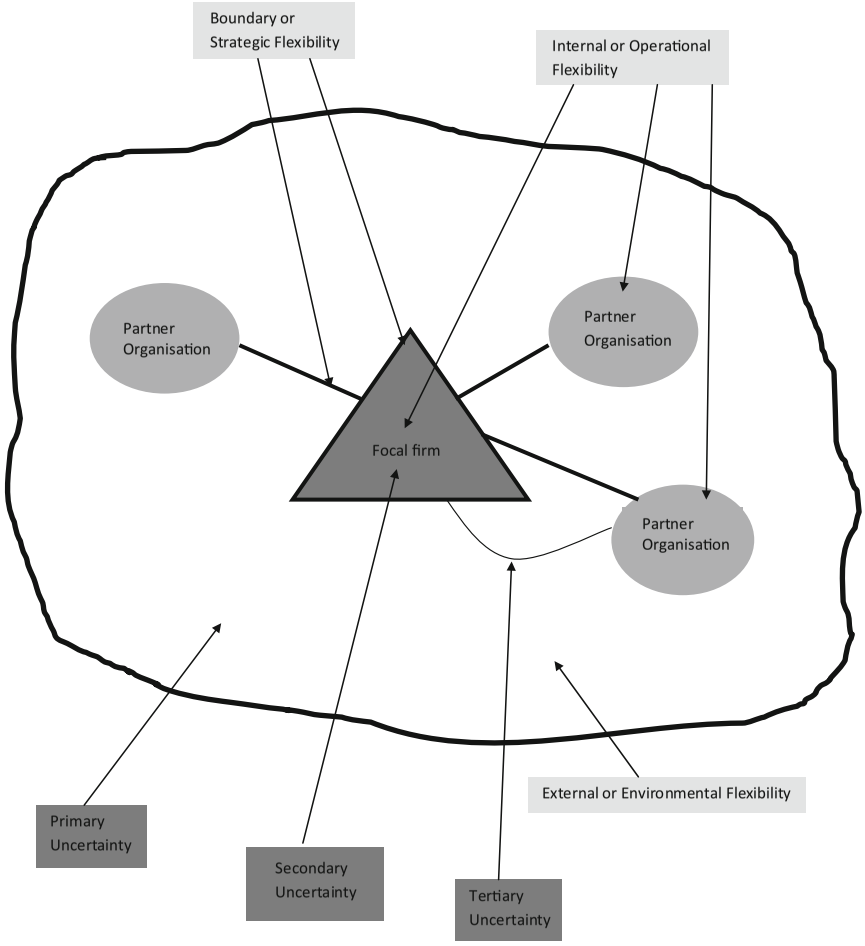

Fig. 2.1 Conceptualisation of uncertainty and sources of flexibility in the global factory

In this simplified conception, the centre of the global factory is the lead or focal firm internalising key activities such as innovation, branding, and critical management tasks. The focal firm is likely to be hierarchical to some degree in its organisation. For the sake of exposition, the focal firm is shown to be involved with just three external partner organisations. These may be upstream (suppliers for example), or downstream (distributors, retailers, after sales service providers). Both the focal firm and its partners exist within a wider international business environment, shown by the orange boundary line in Fig. 2.1. This implies that transactions between the focal firm and its external partners cross national borders.

Figure 2.1 suggests that the firm faces three types of uncertainty, termed primary, secondary, and tertiary uncertainty (Buckley & Carter, 2002). Primary uncertainty arises in the business environment and may be the result of social, economic, technological and political changes, or competitor actions. Primary uncertainty encourages broad environmental scanning as such changes create both opportunities and challenges for business. Scanning results in the collection of significant volumes of information, much of it pertaining to exogenous changes. It is the collation, integration, and synthesis of such information that gives rise to secondary uncertainty. Secondary uncertainty is an internal management issue that occurs because of incomplete or unproductive synthesis of knowledge. It results from the ineffective combination of knowledge where, for example, managers are not aware of intentions or actions of other members of the management team. In Fig. 2.1, secondary uncertainty is depicted as an internal management problem but is likely to involve a wide range of knowledge inputs drawn from a variety of international sources. Secondary knowledge problems may be addressed through changes in organisational structures and incentive and reward systems. A third type of uncertainty, tertiary uncertainty, arises from interactions with external parties and can create opportunism (Williamson, 1996), where those holding valuable knowledge fail to reveal or share it, misrepresent it, or use it for their own benefit. These sources of uncertainty create a series of organisational problems involving the effective acquisition of information (primary uncertainty), its synthesis and integration within the management task (secondary uncertainty), and ensuring its effective deployment (tertiary uncertainty) (Buckley & Carter, 1996).

For the global factory, flexible structures and systems contribute to resilience and a reduction in the costs of these forms of uncertainty. Systems are resilient if they can absorb shocks. Flexibility is developed in three key areas.

The first, termed external or environmental flexibility, is concerned with the acquisition of knowledge about environmental conditions and how these can be used to the advantage of the firm. The global factory is likely to invest heavily in environmental scanning, in part because of the significant options it enjoys in location choice. It is able to access optimum locations, selected in terms of cost, resource availability, and quality. We would expect flexibility considerations to be factored into location decisions, for both the firm's own operations and in the selection of partner organisations. If the pace of environmental uncertainty increases, location switching might be expected to rise. The more diverse are the operations of the global factory—both geographically and number of partner organisations—the more environmental information the focal firm can secure, contributing to more efficient location decisions. Access to overseas locations can bring significant flexibility gains as the example of Apple illustrates. For iPhone manufacture in 2013, Apple used suppliers in more than 25 countries, who, collectively undertook more than 767 fabrications. Of these, 637 fabrications (83 per cent) were undertaken in Asia. China was the most significant source country responsible for 330 fabrications (FinancesOnline, 2013). Part of China's attraction to Apple was the flexibility it offers, with one estimate suggesting that ramping up production where 8700 engineers are needed to manage 200,000 factory employees, would have taken 9 months in the USA, but just 15 days in China (FinancesOnline, 2013).

The second form of flexibility shown in Fig. 2.1 is termed operational or internal flexibility and refers to the deployment of labour within establishments, by both the focal firm and its suppliers. We have discussed the most likely scenario under which this might occur, labour market dualism based on a core-periphery division. There is evidence that such dualism occurs both within focal firms and between the focal firm and suppliers. Amazon provides an example of a company that apparently uses labour intensification in some of its secondary activities that it directly controls such as warehousing (Soper, 2011). However, recent

reports suggest that the company encourages a highly competitive, even ruthless, work culture throughout all its operations, negating the argument of a core-periphery division (Kantor & Streitfeld, 2015). Reports of dualism between plants in global factory networks encompass a range of industries including clothing, footwear, electronics, cut flowers, and even false eyelashes (Balch, 2015; Chamberlain, 2013). Industrial accidents, such as the Rana Plaza fire in Bangladesh in 2013, illustrate the dangerous working conditions that some suppliers offer (Burke, 2013). As mentioned in the previous section, it is more likely that the global factory will use its locational differentiation to utilise core-periphery divisions between plants (both owned and contracted) enabling it to avoid the challenges of duality within a single establishment.

The third type of flexibility identified in Fig. 2.1 is strategic or boundary flexibility that arises from the ability of the global factory to exploit global locational and governance differences. In this case, the focal firm gains flexibility advantages through placing activities in less regulated locations, or managing operations in ways that provide enhanced flexibility.

Locational differentiation contributes to flexibility in several ways. One is simply the pricing advantage that access to lower-cost sites provides. In the event of a decline in product demand or an increase in competition, the firm could exploit the gap between (lower) costs and retail prices since it has access to lower costs of production. In addition, offshore locations may offer more favourable production and regulatory conditions where, for example, there is a plentiful supply of skilled labour, a competent supply base, or fewer restrictions on labour utilisation. It is perhaps not surprising that global factory systems are heavily focused on China and South-East Asian economies where there are fewer operating restrictions than in areas such as Europe. State-led capitalism, characteristic of many of the most popular Asian locations, helps underpin competitive operating conditions (Amsden, 1992; Leftwitch, 1995).

A second flexibility benefit of locational differentiation results from a more effective application of segmentation. The global factory conceives of segmentation in terms of activity fragmentation or ‘fine slicing’ rather than simply labour deployment. This type of segmentation allows the firm to avoid many of the difficulties that arise when dualism is introduced in

a single location. For example, the focal firm is able to implement distinct knowledge strategies with exploration occurring in higher value-based locations and exploitation within assembly or distribution plants where flexibility is provided by efficient routines (March, 1991). Appropriate and differentiated leadership styles and corporate cultures can be operated across plants, particularly where ownership is not shared. Trying to operate dual cultures or leadership styles within the same establishment is likely to be extremely challenging. In addition, locational differentiation enables a network to work in a matching fashion, where core and peripheral workers complement one another and the latter is not simply a buffer protecting the former, as conceived in core-periphery labour models. Such differentiation can also be taken further where the focal firm opens its internal markets to competition, perhaps requiring internal units to service both inside and outside customers. This can bring benefits of both scale and market discipline. A third benefit of locational differentiation is in increasing information sources and facilitating adjustment to change. A network offers multiple sources of information, increasing awareness of volatility. It also provides specialist suppliers who, because of their high-quality knowledge, may be better able to anticipate change. This attenuates adjustment costs and increases flexibility in a cost-effective way.

Strategic flexibility can also result from governance advantages enjoyed by the global factory. Establishment differentiation based on ownership helps to overcome some of the challenges of implementing flexibility strategies. These include the difficulties of overcoming inertia or administrative heritage, violation of employee perceptions of psychological contracts, and internal conflict (see below). In addition, governance differentiation brings risk advantages. Externally sourced suppliers and partners provide more strategic options than growth based on vertical integration and allows for real option strategies, joint ventures or contractual supply relations. While the core-periphery labour market literature suggests that employers are seeking to pass risk onto employees, we would argue that more accurately this risk is being assumed by supplier and partner organisations within a global factory network. Ownership or governance separation also reduces reputational costs in the face of adverse events. Heavy investments in technology and brand building may be better protected where membership of a global value chain is less than transparent.

Our discussion highlights a number of features of flexibility strategies within the global factory. First, we suggest that flexibility is a complex and diverse concept, stemming from several sources. The global factory enjoys a number of distinct sources of such advantage, some of which are not available to the domestic or more traditionally organised international business. Second, the structure of the global factory enables it to better exploit the various forms of flexibility and to minimise conflict that usually arises when increased flexibility is sought. The analysis also highlights the advantages that the global factory enjoys in managing continuous disequilibrium. The challenges of balancing stability and change are considerable, particularly when the two are pursued simultaneously within a single organisation. Our model highlights the possibly of relative stability within the focal firm coexisting with continual disequilibrium within other parts of the factory network. The challenge for the focal firm directing the network is in balancing differential rates of change within elements of the system. This is a quite distinct management task.

The Costs of Flexibility

Flexibility is not costless: as well as the direct costs of building and maintaining flexible strategies and structures, there may also be indirect costs if the pursuit of flexibility involves trade-offs with other desirable goals. In this section, we consider some of the key costs.

Coordination and Transaction Costs

If flexibility is achieved through externalisation to partner organisations, then coordination or transaction costs will arise. These costs can be compared to those necessary for the management of an internal hierarchy, but which may imply a lower level of flexibility. In situations such as employment, hierarchies may be a lower-cost option than contracting through the market (Williamson, 1975) but do carry coordination costs. The relevant comparison is thus between the costs of hierarchy and the (likely higher) costs of externalisation where the difference is a premium

for enhanced flexibility. However, the pursuit of flexibility is likely to impact not just the volume, but also the nature, of coordination costs. If, for example, greater flexibility necessitates multiple sourcing, or the regular switching of suppliers to ensure lowest cost, then average supplier tenure is likely to fall. Cooperation based on loyalty is liable to decrease, and incidences of cheating may rise since perceptions of a continuing and significant business relationship are reduced. In such a situation management priorities may change. Managers would need to place greater weight on identification, effective screening, and comprehensive due diligence when selecting partner organisations. The creation of a transparent corporate culture emphasising loyalty could assist in reducing incidences of cheating or opportunism. Inculcating such values and behavioural changes is likely to add to coordination costs.

There are reasons to believe that the costs of contracting may have fallen in comparison with management by fiat. This has occurred as technological developments in communication and control have facilitated integration, particularly cross-border activities, a world market for specialist skills has emerged (Liesch et al., 2012), and global factory firms have invested heavily in developing their coordination skills. Indeed, we would argue that such skills are now the primary source of competitive advantage of the global factory (Enderwick & Buckley, 2015).

Flexibility and Conflict

As discussed earlier, the coexistence within the same organisation of employee groups engaged under different terms and conditions, and possibly involved in the same or interrelated tasks, may be a source of resentment and conflict, hampering organisational performance. Conflict is particularly likely if peripheral employees are used to cushion core employees, with the former effectively assuming a disproportionate share of employment risk. The response of the global factory to this paradox may be to ensure that dualism occurs between organisations rather than within a single establishment (Harrison, 1994). Such segmentation not only helps avoid direct conflict but allows greater differentiation if it occurs between operations subject to varying cost and regulatory regimes.

Flexibility and Commitment

High-performance workplaces are likely to be characterised by high levels of employee commitment. Traditionally, commitment has been secured through the provision of job security and favourable pay and working conditions. However, the growth of less secure employment and performance-based evaluation have eroded this fundamental bargain, with, at best, opportunities for training and development to enhance 'marketability' replacing security of tenure. Opportunities to increase capabilities, while valued by many employees, do little to encourage commitment to a single employer. Ensuring employee commitment is likely to be problematic, particularly where employment conditions of a group of employees are changed unfavourably. Since such changes often coincide with lower levels of institutional and regulatory workplace support such as trade union coverage or social security benefits, they can trigger unconstructive responses. In essence, some employees may believe that their 'psychological contract', the terms of the exchange relationship between employee and employer, has been breached (Hiltrop, 1996). Maintaining psychological contracts within a flexible organisation pursuing some form of dualism necessitates significant investments in training and development opportunities. If the organisation is reluctant to make these investments, perhaps because it is primarily seeking to cut costs, commitment levels may be expected to plummet. For the global factory, the simplest solution to this problem is to differentiate activities and to ensure that tasks which are likely to be restructured are outsourced. This no longer means externalising a complete function such as production, but through 'fine slicing' targets specific tasks and employee groups. For the global factory, dualism (or more broadly, significant differentiation) may exist between network members, but does not have to occur within a single establishment.

Flexibility and Organisational Learning

The purpose of flexibility is to enable the firm to better respond to changing opportunities and volatility. This highlights the importance

of learning within an organisation since the degree of organisational knowledge and capability determine the extent and direction of flexibility (Volberda, 1998). The strategic management literature increasingly stresses the dynamic nature of firm capabilities and how these enable the firm to respond to rapidly changing conditions (Kandemir & Hult, 2005; Teece, Pisano, & Shuen, 1997). Dynamic capabilities require continuous renewal and this occurs through organisational learning (Beer, Voelpel, Leibold, & Tekie, 2005). Organisational learning contributes to firm flexibility in a number of ways. Continual learning improves information processing capabilities, enabling the firm to identify and respond to new opportunities before competitors (Dickson, Farris, & Verbeke, 2001). Recurrent learning also facilitates 'unlearning' when obsolete mental models and approaches must be abandoned (De Holan, Phillips, & Lawrence, 2004). Learning adds to the firm's stock of accumulated experience and this is likely to be positively correlated with the ability to adjust to a rapidly evolving environment (Kenny, 2006). The limited evidence suggests that organisational learning contributes to firm flexibility and the ability to deploy resources in anticipation of change (Santos-Vijande, Lopez-Sanchez, & Trespalacios, 2012).

Flexibility and Innovation

Since innovation in products, processes, and coordination provides a primary source of competitive advantage for the global factory, understanding the links between flexibility and innovation is important. Unfortunately, this is not a simple matter. One reason is likely causal ambiguity between innovation and flexibility. Does successful innovation require a flexible organisation or does the implementation of innovation create flexibility? The reality is that multiple causation is likely to exist. A further complication is the complex nature of innovation. The term has been applied to a wide range of activities, rarely clearly defined. If we take the position that most innovation results from new combinations of existing processes, products, and ideas (Freeman & Soete, 1997), then functional flexibility might be expected to be positively related to

innovation. Employees who are multiskilled, enjoy autonomy in their work and have expectations that their input will be valued, are likely to be more creative. There may also be an information technology effect if such workers are more socially connected, since innovativeness and social networking are correlated (Metcalfe, 2004).

Empirical evidence supports the view that functional flexibility and innovation are positively related (Hammond, Neff, Farr, Schwall, & Zhao, 2011; Shalley, Zhou, & Oldham, 2004; Spiegelaere, Gyes, & Hootegem, 2013; Zhou, Dekker, & Kleinknecht, 2011). However, the opposite seems to hold for other forms of flexibility, particularly numerical flexibility (Michie & Sheehan, 2003; Pieroni & Pompei, 2007; Probst, Stewart, Gruys, & Tierney, 2007; Spiegelaere et al., 2013). Explanations for this focus on the likelihood that employment insecurity reduces commitment and undermines training investments made by the firm (Sverke, Hellgren, & Näswall, 2002; Zhou et al., 2011). The counter to this view is that flexible contracts add to the resources of the firm with high rates of turnover injecting new knowledge and perspectives. Storey, Quintas, Taylor, and Fowle (2001) offer a more nuanced explanation suggesting that contract employees may complement an organisation's (other) innovative employees, implying a positive, but indirect, relationship. Research focusing on organisational characteristics suggest that flexible employment policies are rarely used as part of an innovation enhancing strategy and that more innovative organisations avoid such contractual arrangements (Lorenz & Valeyre, 2005; Michie & Sheehan, 2003; Storey et al., 2001). The use of temporary employees may also affect the type of innovation that a firm produces, with one study suggesting that their presence is associated with imitative, rather than original, innovation (Zhou et al., 2011). In summary, the research suggests that while functional flexibility may be positively related to innovativeness of individuals and organisations, numerical, or contractual flexibility appears to have a negative influence.

For the global factory, the logical conclusion may be to acknowledge the twin informational aspects of innovation, utilising the distinction between explorative and exploitative knowledge production (March, 1991). Knowledge exploration involves the creation and acquisition of new knowledge, emphasising the stages of search, discovery and experi-

mentation. Knowledge exploitation highlights the application of existing knowledge to improve performance utilising routinisation and effective implementation (Holmqvist, 2004). The effective management of exploitative and explorative knowledge strategies calls for quite distinct approaches (Grant & Baden-Fuller, 2004). Exploration is best undertaken across a wide range of possible sources, which facilitates novelty (Nooteboom, 2000). In contrast, exploitation of knowledge benefits from overlap and repeated experimentation (McEvily, Eisenhardt, & Prescott, 2004). For the global factory, this suggests a logical differentiation under which the focal firm, with its wider perspective, focuses on knowledge exploration, while specialist partner organisations emphasise the effective deployment of knowledge through exploitation.

Flexibility and Firm Performance

The pursuit of increased flexibility has important implications for firm performance. Because such initiatives impact on both cost and motivation, they influence performance (Valverde, Tregaskis, & Brewster, 2000). The extent of such costs and performance effects depends on the type of initiative adopted. Enhanced functional flexibility can contribute to greater performance where employees can be deployed to multiple tasks or skills are deepened. Employees enjoying job enlargement or increased responsibility may be more motivated. This could enable a reduction in resources committed to supervision or lower level management. The cost of functional flexibility is the need to ensure continuing employment relationships and the provision of employee development opportunities. As suggested above, these two may be incompatible.

Numerical flexibility seeks to reduce labour costs by better matching labour demand and supply through the use of variable hours and fixed term contracts. Such employees may also reduce costs if pay rates are lower or indirect costs (pension, sickness benefits) can be avoided. The costs of numerical flexibility revolve around the recruitment, retention, and effective deployment of such workers. This may necessitate increased managerial resources. Again, the global factory may find it more effec-

tive to synchronise labour demand and supply requirements through externalisation, effectively passing the costs and risks to an outside party. Rather than having to deal with labour as a factor of production, the focal firm sources products, intermediate components, and services from outside organisations in an embodied form.

Barriers to Flexibility

As well as the assessable costs of instituting flexibility, there are a number of barriers likely to impede the adoption of flexible strategies. The first of these is administrative heritage (Bartlett & Ghoshal, 1990; Collis, 1991). Administrative heritage is part of the accumulated assets of a firm and captures the ways in which an organisation's history determines its current strategy and structure. It influences a firm's strategy, generally constraining strategic choices. Administrative heritage is typically a source of organisational inertia reinforcing existing strategic and structural patterns and adversely impacting both the pace and direction of change. In the present context, we might expect traditional MNEs characterised by hierarchical internal exchange and coordination to be less inclined to adopt strategies of externalisation because of an entrenched organisational resistance (Liesch et al., 2012). Externalisation within a global factory network allows the lead firm to access a range of administrative heritages, some of which, such as new start-ups, can avoid historical inertia.

A second constraint is the existing level of external transactions that the global factory undertakes. Positive experience of outsourcing should encourage greater utilisation of this strategy, hence the higher the current level, the more likely is further externalisation (Liesch et al., 2012).

Product- and industry-specific characteristics are a third constraint on flexibility strategies based on externalisation. Where there are unique product characteristics such as the need for a high level of customisation, challenging logistics requirements, critical intellectual property protection needs or onerous quality standards, a strategy of internalisation offering enhanced control, may be preferred.

Conclusions

This paper examines the concept of flexibility within global factory systems. While a global factory is generally associated with higher levels of flexibility, the forms, and sources of this have not been clearly articulated. We offer a simple conception which links three forms of volatility with three sources of flexibility. We suggest that locational and governance differentiation characteristic of global factory systems offers more than lower cost and the benefits of specialisation. Differentiation also facilitates the pursuit of flexibility, a critical attribute for a customer-focused organisation operating in a volatile environment. Differentiation helps to mitigate many of the costs associated with pursuing labour flexibility enhancing strategies including conflict, commitment, learning, adverse reputational effects, and innovation.

Segmentation within the global factory may be based on task or activity, but it creates opportunities for accessing less regulated locations, for risk sharing, and for applying distinct management styles and practices. A domestic business, lacking these options, faces greater challenges when seeking increased flexibility. While mult-iplant operations do imply higher coordination costs, this is an area where the global factory enjoys competitive strength.

Our discussion has interesting implications for management within global factory systems. It highlights the importance of the focal firm in setting the intention of the business and shaping partner strategy around the overriding goal of customer satisfaction. The focal firm, drawing on the inputs of a multiplicity of contributor firms, needs to ensure cross-functional and cross-hierarchical coordination. What it does not need to do is engage in operational matters within partner organisations. Here, a strategy of minimal critical specification—focusing on cost, quality, and timeliness—may be the optimum approach.

The importance of flexibility also helps to explain a number of interesting characteristics of global firms. One is locational stickiness in the face of rising costs. For example, commentators have suggested that China could experience disinvestment if costs, particularly wage costs, continue to rise. We would argue that China's attractiveness to international busi-

ness is built on much more than labour cost. Its relatively unregulated operating conditions, specialist suppliers, and fungible workforce bring advantages of flexibility which could offset declining cost competitiveness.

We acknowledge that our discussion is just a starting point in this important topic. More work on articulating how locational and governance choices influence flexibility is needed. This work needs to be embedded in the contextual reality of multiplant, cross-border operations rather than the firm- or plant-centric focus of labour dualism studies. Network studies, while providing useful insights, need to incorporate the directive role of lead firms within global factory systems. Research that considers regulatory and industry differences would be helpful. Industry characteristics seem to matter with, in some cases, idiosyncratic strategies being well established. An example is provided by 'industry crunch', the intensive work schedules expected before a product launch, apparently widely accepted in industries such as gaming.

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