

# 'Globalizing' regional development: a global production networks perspective

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Recent literature concerning regional development has placed significant emphasis on local institutional structures and their capacity to 'hold down' the global. Conversely, work on inter-firm networks – such as the global commodity chain approach – has highlighted the significance of the organizational structures of global firms' production systems and their relation to industrial upgrading. In this paper, drawing upon a global production networks perspective, we conceptualize the connections between 'globalizing' processes, as embodied in the production networks of transnational corporations, and regional development in specific territorial formations. We delimit the 'strategic coupling' of the global production networks of firms and regional economies which ultimately drives regional development through the processes of value creation, enhancement and capture. In doing so, we stress the multi-scalarity of the forces and processes underlying regional development, and thus do not privilege one particular geographical scale. By way of illustration, we introduce an example drawn from recent research into global production networks in East Asia and Europe. The example profiles the investments of car manufacturer BMW in Eastern Bavaria, Germany and Rayong, Thailand, and considers their implications for regional development.

**key words** globalization global production networks regional development Asia Europe

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## Introduction and theoretical context

One of the many paradoxes of the processes of 'globalization' is the continued significance of 'regions', in the sense of sub-national spaces as foci of economic activity. Systemic processes of rapid technological change, enhanced capital mobility and neoliberally inspired inter-regional competition for investment have focused attention on the need for regional-level interventions among a broad community of academics and policymakers. Two recent strands of work attempt to tackle the links between globalization dynamics and notions of 'regional development'. One strand places particular

emphasis on endogenous institutional structures and their capacity to 'hold down' global networks (for overviews see MacLeod 2001a; Scott 1998; Storper 1997). The other strand, focusing specifically on inter-firm networks and global commodity/value chains (GCCs/GVCs), considers the organizational structures of global firms' production systems and explores how particular regions 'slot into' these networks with varying impacts on industrial upgrading (see Gereffi and Kaplinsky 2001; Gereffi 1994 1996).

In their early formulations, both of these literatures could be criticized for their failure to effectively conceptualize regional economic development in

an era of globalization. The new regionalism literature seemed overly pre-occupied with local transactions and institutional forms at the expense of the many extra-local connections within which regions are embedded, while the functional connections between seemingly desirable regional institutional configurations and actual levels of economic development were open to question (Amin and Thrift 1994). The GCC/GVC approaches, in turn, operated largely at the national scale, saying little about how particular sub-national spaces and their institutions are integrated into, and shaped by, transnational production systems (for recent critiques, see Henderson *et al.* 2002; Smith *et al.* 2002; Dicken *et al.* 2001).

Recent developments in these two fields, however, have begun to address these shortcomings and to move somewhat closer together. The 'new regionalism' literature, for example, places increased weight on the extra-local dynamics shaping economic growth within regions (both knowledge, capital and labour flows and also the wider institutional structures within which regions are embedded (e.g. Amin 2002; MacKinnon *et al.* 2002; Bunnell and Coe 2001; MacLeod 2001a; Lovering 1999). Conversely, a number of GCC and GVC studies explicitly explore how regional clusters and industrial districts are incorporated into global production systems, and consider their implications for local economic development and industrial upgrading (e.g. Bair and Gereffi 2001; Gereffi *et al.* 2001; Humphrey 2001; Sturgeon 2001; Humphrey and Schmitz 2000).

In this paper, we seek to make a primarily *conceptual* contribution to these converging research agendas. Drawing upon a global production networks (GPN) perspective (see Henderson *et al.* 2002), and deriving insights from both the new regionalist and GCC and GVC literatures, our approach focuses on the dynamic 'strategic coupling' of global production networks and regional assets, an interface mediated by a range of institutional activities across different geographical and organizational scales.<sup>1</sup> Our contention is that regional development ultimately will depend on the ability of this coupling to stimulate processes of value creation, enhancement and capture.

We regard regional development as a set of *relational processes* (see Amin 2002). It is also, by definition, an *interdependent* process (Massey 1984). The fortunes of regions are shaped not only by what is going on within them, but also through wider sets of relations of control and dependency, of competition

and markets. These relations may be with other regions within the same national territory, but increasingly occur at the international scale. Hence, our conceptualization of a region is not as a tightly bounded space, but as a porous territorial formation whose notional boundaries are straddled by a broad range of network connections (Amin 2002; Allen *et al.* 1998).

The paper is organized into two main sections. First, we explore how the strategic coupling of global production networks and regional assets may (or may not, depending on the context) facilitate the processes of the creation, enhancement and capture of value upon which regional development ultimately depends. Second, in order to illustrate how our conceptual framework might be utilized empirically, we present an illustrative case study of the German car manufacturer BMW and its interactions with regional development processes in Eastern Bavaria, Germany and Rayong, Thailand.

### 'Globalizing' regional development: towards a re-conceptualization

In developing a broad conceptual framework for understanding regional development we need to pay analytical attention *both* to endogenous growth factors within specific regions *and* also to the strategic needs of trans-local actors coordinating global production networks (cf. Scott and Storper 2003). In our framework, regional development is conceptualized as *a dynamic outcome of the complex interaction between territorialized relational networks and global production networks within the context of changing regional governance structures*. In that sense, it resonates with Amin's topological/relational view (Amin 2002; see also Dicken 2004). We aim to specify the interactive complementarity and coupling effects between localized growth factors and the strategic needs of trans-local actors in propelling regional development. We argue that it is these *interactive effects* that contribute to regional development, not inherent regional advantages or rigid configurations of globalization processes. Despite certain path-dependent trajectories, regional development remains a highly contingent process that cannot be predicted *a priori*. This conceptualization, however, does not mean that regional institutions are unimportant. On the contrary. Often, such complementarity and coupling effects can be enhanced and exploited through particular sets and practices of 'regional' institutions. The

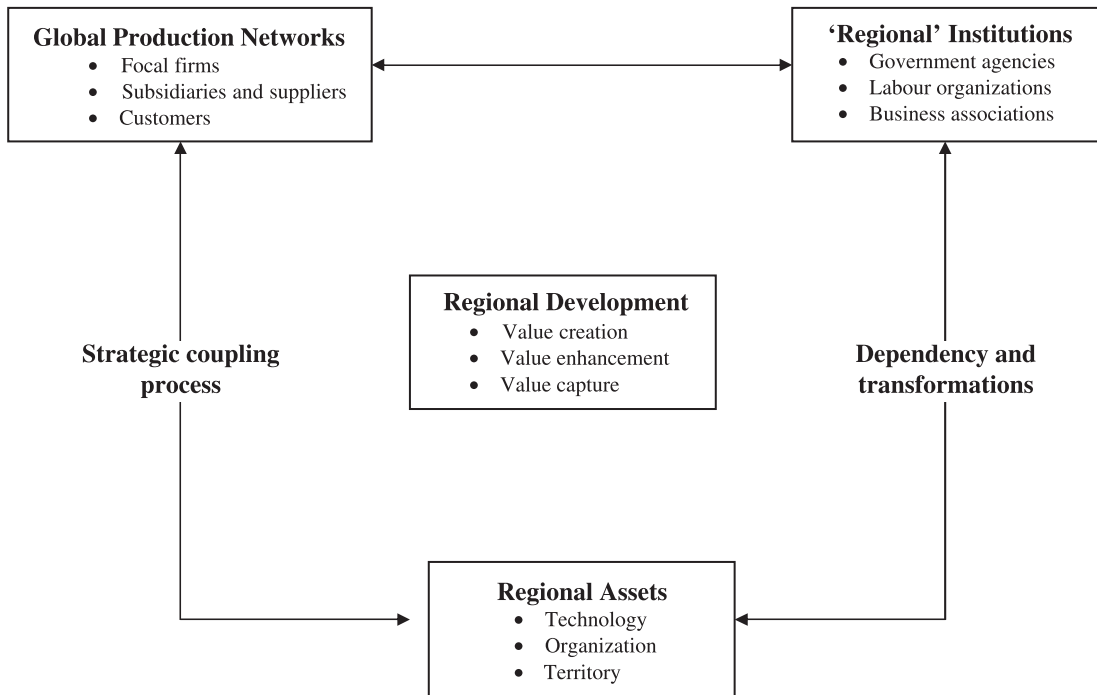


Figure 1 A framework for analysing regional development and global production networks

term 'regional' must be used with care here. We place it in scare quotes to indicate that, in reality, regional development is not just shaped by regionally specific institutions, but also by a variety of extra-local institutions (e.g. national, supra-national) that will impact on activities *within* a region. This 'scaling' of institutional influence is critical. In short, regional development at any particular historical moment requires the *necessary* co-presence of three inter-related sets of conditions:

- 1 the existence of economies of scale and scope within specific regions;
- 2 the possibility of localization economies within global production networks; and
- 3 the appropriate configurations of 'regional' institutions to 'hold down' global production networks and unleash regional potential.

We have summarized these conditions and their interactions in Figure 1.

*Regional advantages, global production networks and economies of value.*

Our analytical framework starts with the premise that endogenous factors are necessary, but in-

sufficient, to generate regional growth in an era in which competition is increasingly global. There is no doubt that, for development to take place, a region must benefit from economies of scale and scope derived from what Storper (1997, 26) terms the 'holy trinity' of technology–organization–territory. In Figure 1, we use the term 'regional assets' to describe this necessary precondition for regional development. In general, these assets can produce two types of economies. First, economies of *scale* can be achieved in certain regions through highly localized concentrations of specific knowledge, skills and expertise. This concentration of technological advantages embodied in and performed by social actors located in specific regions creates economies of scale in particular technologies that can be exploited through the agglomeration of firms that in turn provide employment and generate economic outputs within similar high tech industries. Second, economies of *scope* can exist if these regions are able to reap the intangible benefits of learning and the cooperative atmosphere embedded in these agglomerations. These are famously known as 'spillover' effects. A variety of different high value-added activities may be

**Table I** Local and non-local dimensions of regional development

<i>Dimensions</i>	<i>Local manifestations</i>	<i>Non-local forms</i>
Firms	Indigenous SMEs Industrial clusters Intra-regional markets Venture capitalists	Global corporations Entrepreneurial subsidiaries Distant global markets Decentralized business and financial networks Global production networks
Labour	Skilled and unskilled workers Permanent migrants	Skilled experts and technologists Transient migrants Transnational business elites
Technology	Spillover effects Tacit knowledge Infrastructure and assets	Global standards and practices Intra-firm R&D activities Technological licensing Strategic alliances
Institutions	Conventions and norms Growth coalitions Local authorities Development agencies	Labour and trade unions Business associations National agencies and authorities Inter-institutional alliances Supranational and international organizations

located or developed in these regions because the tendencies towards learning and cooperation facilitate a broad spectrum of production and entrepreneurial activities.

We argue that economies of scale and scope embedded within specific regions are only advantageous to those regions – and bring about regional development – insofar as such region-specific economies can complement the *strategic needs* of trans-local actors situated within global production networks. As shown in Figure 1, when such a complementary effect exists between regions and global production networks, a coupling process will take place through which the relational advantages of regions interact with the strategic needs of actors in these global production networks. Regional development thus depends on such a coupling process that evolves over time in relation to the rapidly changing strategic needs of global production networks and the rather slow transformations in regional economies of scale and scope. Before we analyse such a coupling process, it is important to unpack what we mean by the *strategic needs* of actors in global production networks. We define *global production networks* as the globally organized nexus of interconnected functions and operations by firms and non-firm institutions through which goods and services are produced and distributed. Such networks not only integrate firms (and parts of firms) into structures which blur traditional organizational boundaries through the development of diverse forms of equity and non-equity

relationships, but also integrate regional and national economies in ways that have enormous implications for their developmental outcomes. At the same time, the precise nature and articulation of firm-centred production networks are deeply influenced by the concrete socio-political contexts within which they are embedded. The process is especially complex because while the latter are essentially territorially specific (primarily, though not exclusively, at the level of the nation-state and/or the region), the production networks themselves are not. Global production networks 'cut through' national and regional boundaries in highly differentiated ways, influenced in part by regulatory and non-regulatory barriers and local socio-cultural conditions, to create structures that are 'discontinuously territorial' (see Henderson *et al.* 2002; Dicken and Malmberg 2001).

Put in these conceptual terms, it becomes clear that local actors in specific regions (e.g. labour and the state) and non-local actors in global production networks (e.g. TNCs and financial capital) are differentiated by their degree of *territorial embeddedness* which, in turn, will have very significant implications for regional development (see Table I). This distinction in territorial embeddedness is important because it shapes how value and power are distributed in their relational interactions, a point we develop in the next section (see also Hudson 2001).

As key local actors in regional development, the organizational strength and flexibility of labour is

critical to the alignment of the region with the strategic needs of focal firms in global production networks. While labour has been internationalizing through inter-institutional alliances and international organizations (see Table I), the reality remains that in most cases labour is spatially entrapped in local labour markets (see Herod 2001; Peck 1996). To Castree *et al.*, workers face a particular kind of geographical dilemma because 'what might make sense for them at one geographical scale may have unfortunate consequences at other scales' (2004, 119). They thus recognize that

it's not just that workers may be tempted to put local interests first, it's also that the very *nature* of local interests varies depending on the specifics of local industry, local standards of living, local living wages and so on. (Castree *et al.* 2004, 120; original emphasis)

In short, there is a *prima facie* case that economies of scale and scope in particular regions can be reaped more effectively by focal firms in global production networks through labour's spatial immobility and flexibility in skills. The local and the regional become the most important geographical scales through which labour interacts with the strategic needs of key actors in global production networks. Their interactive effects tend to favour trans-local actors embedded in these global production networks because, as pointed out some time ago by Massey (1984) among others, these global actors can engage in 'spatial switching' much more easily than workers themselves.

Similarly, the state and its development agencies are institutions that are strongly embedded locally in specific regions (see Table I again). This institutional dimension of regional development has been well theorized in the new regionalism literature (e.g. MacLeod 2001b). It is sufficient to say that the increasing devolution of political and economic authority from the nation state to local and regional institutions has led not only to the rise of growth coalitions within specific regions, but also to a higher degree of uneven regional development. The latter phenomenon occurs primarily because different regions have very different configurations of state institutions that in turn shape how these regions are articulated into global production networks. This situational power and role of the state (and labour) and its manifestations in local and regional institutions has very important implications for understanding the distributional aspects of regional development. In regions that

have strongly embedded local labour markets, we argue that focal firms in global production networks can better exploit economies of scale through technology- or expertise-specific production systems (e.g. in biotechnology or cultural industries). In regions with more flexible labour markets, economies of scope might be better achieved through the co-presence of a variety of different industries that reap the benefits of 'untraded interdependencies'. The role of state institutions is important here through their regulation of labour and its organizations. In some regions, state institutions may work with labour organizations and labour market intermediaries to increase the skill levels of labour and the flexibility of local labour markets (see Benner 2003; Peck 2000; Jones 1999). In other regions, the adversarial and confrontational relationship between the state and labour may significantly reduce the region's attractiveness to focal firms in global production networks (see Kelly 2002).

Before we move on to unravel the complexity behind the strategic considerations of focal firms in global production networks, it is useful to consider one significant category of non-local actors that impact significantly on local and regional development: financial capital institutions. While global production networks may not directly encapsulate financial capital in their network configuration, it is useful to distinguish three types of financial capital in relation to their differential territorial embeddedness: local venture capital, national banking institutions and globally decentralized financial networks (see Table I). From the perspective of global production networks, venture capital tends to be highly localized primarily because talents and expertise are often embodied in people within a particular region that are known to venture capitalists through interpersonal networks of relationships. Venture capital is important to regional development both in terms of its financing of high risk ventures that are more likely to be at the cutting edge of technological development and in terms of its financing of supporting industries that supply to global production networks. The nature and organization of local venture capital, however, is embedded within national banking systems.

In some countries, venture capital is much less active because of the close relationships between banks and industries (e.g. Germany and Japan). Regional developmental trajectories are highly dependent on the direction and influence of national

banking institutions (see Dore 2000; Pauly and Reich 1997). In other countries (e.g. the US and the UK), banking institutions play much less significant roles *vis-à-vis* globally decentralized financial networks that are mediated through global financial centres (e.g. New York and London). Regional development in these countries is much less dependent on the presence of banking institutions and more on the articulation of those regions into global financial networks. For example, the availability of investment and equity funds has been critical to the continuous growth and development of Silicon Valley. Such funds emerge from a variety of financial networks that are decentralized in terms of their origin and composition (e.g. US pension funds vs Taiwanese private capital). We argue that the uneven access to these local and non-local forms of financial capital can both enhance the strategic importance of some regional economies to global production networks and diminish others. These different forms of capital also embody different territorial logics, with venture capital being mostly local in its orientation, and decentralized financial networks more global in nature (see also Clark *et al.* 2002).

Hence, spanning national boundaries and market areas, the strategic needs of *focal firms* – defined as dominant firms spearheading the global organization of production networks through their corporate and market power – in global production networks do not always and necessarily intersect with regional advantages. Global integration of activities within these production networks, for example, may not be beneficial to some regions because of the likelihood of greater external control of the regional economy. Indeed, many focal firms in global production networks may pursue different organizational configurations in order to reap economies of scale and scope in these networks. In general, *economies of scale* in global production networks can be achieved through globally integrated R&D, sourcing, production and marketing activities that take place only in specific locations. The smaller the number of firms engaging in each of these functions, the greater the economies of scale will be in a particular global production network. This is because each of these firms can specialize in the designated function, e.g. R&D or assembly operations. *Economies of scope* in global production networks, on the other hand, exist through differentiation in the functional activities of firms in the network such that a variety of firms

may be used for R&D, sourcing, production and marketing activities. These different firms often offer learning and knowledge possibilities that are not available if the function is performed by a single firm, as in the practice of global sourcing or R&D. As Nohria and Ghoshal (1997) argue, many leading global corporations are increasingly tapping into differentiated advantages among different subsidiaries and supplier networks.

#### *Regional development and notions of value creation, enhancement and capture*

How then is this complex organization of different actors in global production networks related to regional development? In Figure 1, this relationship can work through the creation, enhancement and capture of *value*. Here we use the term 'value' to refer to various forms of *economic rent* (Kaplinsky 1998) that can be realized through market as well as non-market transactions and exchanges. Alongside value creation through the labour process, for instance, value can take the form of technological rents by way of access to particular product or process technologies, or may be manifested as relational rents, based on inter-organizational links improving know-how transfer and collective learning. Other forms of rent identified by Kaplinsky may derive from organizational attributes, trade policy and branding. This conception of value as economic rent has two significant implications for analysing regional development. First, different forms of rent can be created and captured by local and non-local actors in global production networks such that some regions might be better in creating and retaining a particular form of rent (e.g. technological rents in Silicon Valley vs brand-name rents in London). A region needs neither to create nor to retain all forms of rent. Instead, a region that is endowed with certain configurations of labour, capital and state institutions might be better off by specializing and being competitive in one kind of economic rent – thus reaping economies of scale. A region with a highly competitive labour market, an active pool of venture capitalists and a pro-growth coalition of institutions will likely be engaged in the creation of value through new growth industries (e.g. biotechnology) that require rapid flows of knowledge embodied in the local workforce, high risk-taking financing and a stable institutional environment. On the other hand, a region burdened by a weakly organized and abundant supply of labour, the virtual absence of venture and banking

capital and an unstable institutional structure may create value through performing highly labour-intensive work for focal firms in global production networks. Endowed with different configurations of assets, both regions perform very different roles in terms of value creation *vis-à-vis* global production networks.

Second, it should be noted that value takes on different forms in this spatialized network of flows. At the time when value is created in one region, it may take a particular form of, say, relational rent in regions imbued with a Marshallian-style cooperative atmosphere. When this value is transferred through global production networks to other regions, it may take on other forms (e.g. technological and/or brand-name rents). This multiplicity in the forms of rent indicates that the analysis of value creation and capture in regional development must go beyond simply tracking market values of goods and services produced. More importantly, we need to unpack the different forms of rent that these values encapsulate.

The fact that a region is 'plugged' into global production networks, therefore, does not automatically guarantee its positive developmental outcome because local actors in this region may be creating value that does not maximize the region's economic potential. A region filled with cooperative atmosphere should be much more successful in creating relational rent, although in some cases cultural and institutional impediments may prevent such value from being created. Local actors in a region also may not be able to capture much of the value created in the region (cf. Amin and Thrift 1992). From the regional development perspective, the creation and retention of value within the region is imperative. For example, a region may have an advantage in the quantity of labour, but much of the value created in the utilization of this abundant pool of labour may be transferred out of the region through the repatriation of profits (realized value) and eventually the relocation of the production networks to other regions. At the other end of the value-creation spectrum, nevertheless, a region with substantial 'relational assets' (e.g. cooperative learning and venture capital formation) may be successful in creating value in team-based projects that require face-to-face interaction in spatially proximate clusters. However, such a value creation process may run out of steam when these highly localized conventions and norms in learning are so binding and constraining that they

hinder the development of alternative mode of learning, say, through decentralized and distanced networks facilitated by greater mobility of actors and a series of other technologies of contact and translation (see Coe and Bunnell 2003; Amin 2002; Bunnell and Coe 2001).

Hence, regional assets can become an advantage for regional development *only if* they fit the strategic needs of global production networks. The process of 'fitting' regional assets with strategic needs of global production networks requires the presence of appropriate *institutional structures* that simultaneously promote regional advantages and enhance the region's articulation into global production networks (see Figure 1). Again, it is crucial to remember that our notion of 'regional' institutions includes not only regionally specific institutions, but also local arms of national/supranational bodies (e.g. a trade union's 'local' chapters), and extra-local institutions that affect activities within the region without necessarily having a presence (e.g. a national tax authority). These regional institutions are important because they can provide the 'glue' that ties global capital and unleashes regional potential. Three dimensions of such institutional structures are crucial to regional development. The first dimension involves *the creation of value* through the efforts of regional institutions in attracting the location of value-added activities, e.g. training and educating the local workforce, promoting start-up firms and supplier networks, facilitating venture capital formation and encouraging entrepreneurial activities (see also Phelps and Raines 2003). Although it is often unclear whether such a process involves too much 'tying' the region to the value activities of particular focal firms or global production networks (e.g. Phelps *et al.* 1998), the efficacy of this relational coupling between the region and the focal firm hinges on the region's capacity to enhance and capture value from the process. However, in the absence of such a coupling process, the question of regional development remains a moot point since no value will be created, let alone enhanced and captured.

More importantly, the second and third dimensions refer to the capacity of regional institutions in *value enhancement* and *value capture*. Value enhancement essentially involves knowledge and technology transfer and industrial upgrading (from design and final production of commodities). The influence of regional institutions via government agencies, trade unions, employer associations and so on

can be significant here. On the one hand, regional institutions may promote specific 'regional assets' (e.g. cooperative industrial relations) that are conducive to high value-added production activities because these activities incur high costs of fixed investment (i.e. sunk costs) and are difficult to be relocated within a short period of time. There is thus a mutually beneficial interaction between regional institutions and regional assets (see Figure 1). On the other hand, regional institutions can promote the value enhancement activities of focal firms in global production networks. This occurs when regional institutions are prepared to invest in developing the infrastructure and human resources required for value enhancement (e.g. highly stable power supply and skilled engineers for wafer fabrication). Over time, more value enhancement activities within global production networks may occur in these regions when focal firms are induced to bring in their core technologies and expertise. The development of sophisticated local supplier networks, for example, is important in enhancing the value activities of focal firms through 'reverse' transfer of local knowledge and experience (see Chew and Yeung 2001). In short, not all regional assets are complementary to the enhancement of value by focal firms in global production networks. The key issue is the appropriateness and complementarity of these assets, not their mere presence.

The third dimension of regional institutions in promoting regional development rests with their capacity to ensure *value capture*. It is one thing for value to be created and enhanced in some regions, but it may be quite another for it to be captured for the benefit of these regions. The issues of *power* and *control* are critical in the analysis of value capture and the distributional aspects of regional development. While the concept of power is complex in social thought (see Lukes 1986), we follow Allen (2003), who defines power not as a capacity or a repertoire of resources possessed by actors, but rather as *relational effects* of social interaction. To Allen,

power as an outcome cannot and should not be 'read off' from a resource base, regardless of its size or scope . . . It is, as suggested, a relational effect, not a property of someone or some 'thing'. (2003, 5)

Conceived as such, the role of regional institutions in negotiating these issues of power and control with focal firms in global production networks is linked to their development policies, ownership

patterns and corporate governance. Clearly, focal firms in global production networks have enormous corporate control of resources through their ability to collect and process information on a global basis. This information asymmetry may afford very strong bargaining positions to some focal firms when they interact with regional institutions (Dicken 1994 2003). The more a region is articulated into global production networks, the more likely it is able to reap the benefits of economies of scale and scope in these networks, but the less likely it is able to control its own fate. Put in terms of power and control, this non-local origin of regional development happens because

the exercise of power in particular places may well originate beyond those places, at some other location, yet remains part of power's active presence. In other words, the power relations in place are affected by what happens elsewhere and the network of connections of which it is a part. (Allen 2003, 180-1)

This dimension of the external control or dependency of regional development has long preoccupied economic geographers (e.g. Massey 1978; Dicken 1976).

But equally, regional institutions may mobilize their region-specific assets to bargain with these focal firms such that their power relations are not necessarily one-way in favour of the latter. The bargaining position of these regional institutions is particularly high when their region-specific assets are highly complementary to the strategic needs of focal firms – these regional institutions become really powerful through their relational interaction with focal firms in selected global production networks. For example, focal firms that are under severe competitive cost pressures are more likely to allow for some forms of value to be captured in regions that offer not only significantly cheaper factors of production (labour rent), but also highly cooperative labour relations. In this case, these focal firms may choose to invest further to upgrade the local workforce that may better support future regional development through capturing skills and technological rents. Moreover, a region can achieve greater value capture if the reinvestment of retained earnings in localized subsidiaries is critical to a particular function of the global production network (e.g. new process technology) and the focal firm fails to secure further investments through globally decentralized financial networks (e.g. downturns in major stock markets). Such



retention of value through reinvestment in local subsidiaries and/or suppliers may also be enhanced through the availability of venture capital formation or favourable support from national banking institutions.

In both scenarios, those local actors involved directly in these global production networks (e.g. workforce, suppliers, venture capitalists) are likely to benefit from the enhancement and retention of value through skill upgrading, technological innovation and new venture formation. For example, Simmie (2003) recently found that the most innovative firms in Europe tend to concentrate in a minority of key metropolitan regions, combining a strong local knowledge capital base with high levels of connectivity to similar regions elsewhere in the global economy. The likelihood of value capture in specific regions is therefore greatly enhanced by a cooperative set of state, labour and business institutions that offer region-specific assets to focal firms in global production networks. As such, the capacity of regions to capture value is a dynamic outcome of the complex bargaining process between regional institutions and focal firms in global production networks. The presence of region-specific assets is only relevant in this process if these assets are complementary to the strategic needs of trans-local actors embedded in global production networks.

#### *What is new about 'globalizing' regional development?*

The above re-conceptualization of regional development from the global production network perspective complements existing frameworks in at least two ways. First, it takes a dynamic approach to analysing regional development as a 'moving target'. While we recognize the path dependency in the evolution of regional assets (see Figure 1), our framework does allow for regions to break out of this trajectory of lock-in. This possibility occurs when specific regions are confronted with economic crises that do not necessarily originate from these regions. For example, a region may enjoy a relative advantage in a particular global industry (e.g. electronics) or segments of a global industry (e.g. integrated circuits). Even if the path dependency of this regional advantage has been set in motion, the region can still experience major problems of development when crises occur within the entire industry on the global scale. Such crises may be due to technological change that produces a

substitution effect (e.g. the development of superconductors) or financial instability (e.g. over-capacity and over investment). Such a 'global' crisis in an industry may force the region in question to seek alternative development pathways that, if successful, will lead to the end of its path dependency. In this sense, our framework allows for a dynamic view of regional evolution without placing too much emphasis on endogenous structures that inhibit change and transformations.

Second, our framework is explicitly *comparative* because an analysis of the interactive complementarity and coupling effects requires us to examine how such effects materialize in one region but not another region. All too often in the new regionalism literature, we have been told how one region develops because of its endogenous growth factors. What is absent in this analytical approach is how other regions with similar growth factors either fail to develop or evolve through drastically different trajectories. It also ignores the complex interdependencies *between* regions that will shape regional development *within* regions. An explicitly comparative approach to regional development helps us appreciate better the critical mechanisms through which *some* regions gain developmental momentum whereas other regions miss the opportunity.

#### **Global production networks and regional development: an illustrative example**

Clearly, global production networks connect regions in a complex and highly variegated manner and, as a result, the developmental outcomes of these connections will differ in significant ways, depending on the focal firms' strategies, the institutional frameworks and sectoral/technological specifics. We will illustrate this for two regions in Europe and East Asia involved in the global production network of the German car manufacturer BMW Group (see Figure 2) in order to show the strategic coupling of a region's assets with the strategic needs of trans-regional actors. Given space constraints, this example is meant merely to be suggestive of how our framework might be mobilized empirically.<sup>2</sup>

In many ways, the case of BMW resembles the strategies, locational impacts and organizational characteristics of all major car manufacturers. However, while market entry modes and strategies, production and lean management systems, and the JIT-based clustering of suppliers around the main assembly plants are similar to those of



Figure 2 Global locations of BMW group

other firms in the sector, BMW has some specific characteristics that distinguish it from other car manufacturers. As a niche producer for the upmarket and luxury markets, the BMW Group has relatively low production volumes and thus the global production network strategy is to some extent different from that of the mass manufacturers. Also, the company has a very strong base in Bavaria and is approximately 47 per cent owned by members of the Quandt family. This shareholding structure has a decisive impact on inter-firm relationships within BMW's global production network.

*BMW in Eastern Bavaria, Germany*

Economic development in eastern Bavaria, for a long time a peripheral and economically weak region, has been transformed – not least by the arrival of BMW's production plants – since the late 1960s. Headquartered in Munich, the company was looking for new manufacturing sites to expand production and in 1967 took over the small car manufacturer Hans GLAS with its production facilities at Landshut and Dingolfing. The crucial regional asset that attracted BMW to Eastern Bavaria – apart from the proximity to Munich and

the takeover opportunity – was the availability of skilled labour and, increasingly important, a flexible workforce. Since unemployment in the region was high, the recruitment of people at competitive wages was much easier than through the job market in the prospering Munich area. Also, there was a willingness on the part of the workforce to accept flexible working hours and shift structures that allowed BMW to enhance capacity – for example, extending the machine time to 99 hours a week – and thus reduce unit costs. This was supported by cooperative workers' councils and regional labour unions, as well as government aid (through regional development programmes) to boost the weak regional economy. In the wake of BMW's 1982 decision to build another assembly plant in Eastern Bavaria near Regensburg, intensive and continuous negotiations between BMW and the national labour union IG Metall took place, illustrating the regional impact of decisionmaking by, and relational power of, actors inside and outside the region. Against the opposition of the IG Metall head office in Frankfurt, the regional branch of the union engaged in cooperation with Munich-based BMW to implement a work-shift

model that has become a model for the German car industry. A recent example of this process is the negotiations between Volkswagen AG and IG Metall over a new tariff contract (cf. Pries 2002).

So far, BMW has invested some 7 billion Euro and now operates three plants and one supplier park in the area, directly employing about 35 000 people, whilst an estimated further 20 000 jobs have been created by local first-tier suppliers. This represents more than one tenth of all manufacturing employment in the region. The wages and salaries paid to the employees at the company's regional sites exceed 2 billion Euro per year and constitute a considerable source of consumer purchasing power within the region.

The development of BMW's supplier and innovation park in Wackersdorf near Regensburg in the 1990s has increased the integration of its operations in Eastern Bavaria with global production networks. After the German government was forced to abandon the building of a nuclear waste management facility at Wackersdorf, private companies were able to use the location as an industrial park, administered by the agency formerly responsible for setting up the nuclear site. Investors were attracted by the low prices of land available and about 500 million Euro in compensation payments to the region, paid by the federal and state governments, which accelerated infrastructure development. Again, this opportunity matched BMW's strategic needs at that time. The distribution of power between the relevant political and societal actors in Eastern Bavaria, however, has proven to be complex and has played out at different scales – analogous to the different scales of influence from the labour union's and workers' side. The federal and state governments have been under pressure to find alternatives to the planned nuclear facility and thus were obliged to regional political and civil actors, improving the bargaining power of the latter. BMW could reap the benefits from this political struggle and implement their plans in the region at comparatively lower costs.

The Just-In-Time system, introduced at BMW's plants in Regensburg and Dingolfing, increasingly required the co-location of major suppliers, while the modularization of production forced component manufacturers to integrate and coordinate their business. Initially, BMW started to produce convertibles at the new Wackersdorf plant, after it promised to create at least 1600 jobs in the region, but later changed the plans for this area. Using its

significant buying power, BMW persuaded global first tier suppliers like Lear Corp. and Modine (both from the US) to establish plants next to each other in the innovation park. This not only guaranteed the functioning of the production network, but created an innovative context, where suppliers (some of them competitors on the world markets) share tacit knowledge and continuously improve products and processes (cf. Hess 2001). That way, new innovative structures have been created through the BMW-induced arrival of foreign firms in the region, contributing not only to direct employment but also providing the environment for spillover effects that benefit the regional economy. Some of these global suppliers' branch plants have now become leading plants within their parent companies, setting benchmarks for other plants within the production network. The globalization of BMW's production network itself resulted in the establishment of a logistics centre at the same site in Wackersdorf, from which all of BMW's international parts and components distribution to its foreign plants in the US, South Africa, Russia and East Asia is organized, with a daily shipment of 2.5 million parts carried out by a third party logistics provider.

Eastern Bavaria's regional economy has, without doubt, benefited from globalizing processes linked to the region via BMW's production network. Apart from value creation in the form of both domestic and foreign investment, as well as direct and indirect employment, the skills and technology transfer from BMW and its foreign-owned suppliers to local companies ensures a noteworthy degree of value enhancement and capture, which is essential for the region's sustainable economic development. The strategic coupling process between the regional assets and BMW's needs to develop its GPN has not only led to repeated rounds of capital and technological investments, but also provided opportunities for regional actors to capture different forms of rent, notably organizational and relational rents. The process of value creation and enhancement has been mediated through ongoing interaction and negotiation between firm, government and labour representatives at regional and trans-regional scales. However, as BMW is one of the leading economic actors within a quasi-hierarchical regional network, it has got considerable power vis-à-vis institutions and other firms, whereby quite a strong dependency on its commitment to the region remains.

*BMW in Rayong Province, Thailand*

BMW remained, until very recently, essentially a German-based company. Like other major car manufacturers, however, it has had to respond to globalizing forces by creating a geographically more extensive production network (Figure 2). In this context, BMW's entry into East Asia is potentially very significant both for the company itself and for the region, particularly Thailand. Since the 1960s, Thailand has become the centre of Southeast Asia's automotive industry, employing about 120 000 people in the sector. Motor vehicles have become the third biggest export category after computers and electrical circuits: 230 000 cars from a total output of 760 000 in 2003 were exported (*Bangkok Post* 2003). Due to a nationally implemented cluster policy (cf. Lecler 2002), most of the companies in this sector, including BMW, are located to the south of Bangkok, in the Rayong and Samutprakarn provinces of Thailand's Eastern Seaboard (see Figure 2). To date, there are almost two-dozen car manufacturers operating in the region, surrounded by more than 700 first-tier suppliers, 50 per cent of which are fully or partly foreign-owned. The Thai auto component industry is generating an annual turnover of about US\$4bn. In this case, the nation state plays an important role in coupling the regional assets with the strategic needs of global companies and their networks, not least due to the weaknesses or lack of regional institutions. Since BMW is one, rather small player among a fairly large number of companies within the Thai car industry, its power in relation to regional and national institutions is limited. Hence the bargaining position of these institutions is considerable, supported by the fact that south-central Thailand has become first choice location for many foreign firms and thus creates opportunities towards the enhancement of regional assets.

Like many other car manufacturers, BMW has chosen Thailand's gulf area as its prime location for the Southeast-Asian region, because the country had no national car programme and hence this sector was fairly liberalized compared to other countries in the region, especially Malaysia and Indonesia (cf. Tucher 1999). In anticipation of a potentially large market after the completion of an Asian Free Trade Agreement (AFTA), the rationale for production in Asia was mainly to avoid current tariff and non-tariff trade barriers as well as to integrate the region into BMW's global production

network. Initial investments of 25 million Euro in the manufacturing facilities for the 3 series cars will be topped up by an additional 15 million Euro to install a new assembly line for the production of 7 series cars in 2003, to be sold in the domestic and regional markets. Currently, the Rayong plant of BMW employs about 250 people, assembling nearly 4000 cars annually from vehicle kits imported from Germany. These rather small figures suggest a negligible contribution to regional development in Thailand's Rayong province.

Indeed, while local content regulations existed until the year 2000, the bulk of value added parts are not manufactured in the region, but rather brought in from abroad. Since the market is not yet big enough, low production volumes do not allow for economies of scale by establishing a production site, and therefore completely knocked down (CKD) assembly with comparatively little regional value-added prevails. For a BMW car, about 40 per cent of value added is achieved through local content, but this means production and sourcing within ASEAN countries, therefore the value added within the Thai auto cluster is lower than the 40 per cent figure suggests. Furthermore, the regional assets in the South of Thailand do not necessarily match all the needs of car manufacturers like BMW, as the level of skills among the workforce and organizational sophistication have yet to reach the required standards. The fact that most of the suppliers are partly or wholly owned by foreign companies reflects the problems in upgrading the industrial base and transferring skills and technology to local companies. There have been considerable initiatives by the Thai government to adapt to the changing strategic needs of manufacturers like BMW and to participate more strongly in their value-added networks. Through governmental and quasi-governmental organizations, most notably the Board of Investment and the Thailand Automotive Institute, a series of attempts are being made to improve the vocational skills of the Thai workforce and to support domestic SMEs, in close collaboration with foreign manufacturers (see also Lauridsen 2003; Techakanont 2003). In addition, foreign assemblers train their workforce either in-house or put them on training courses within the parent company abroad, with BMW being no exception. However, know-how transfer to domestic suppliers is still rather limited.

The success of BMW's Thai venture depends, to a great extent, on the final implementation of

supranational economic integration under an Asian free trade agreement. BMW has chosen the Rayong plant, its only wholly owned facility in Asia, to become an integrated production site once the institutional framework (AFTA) allows. Rayong will become a full production site whilst its other Southeast Asian locations will serve as BMW centres of excellence. In this way, economies of scale will be achieved through production specialization and exchange within Southeast Asia as a whole. Other companies, e.g. Toyota, follow similar strategies of regional complementation (cf. Yoshimatsu 2002), which provide an opportunity for the Thai auto cluster to upgrade and develop in the region. Once a critical mass is reached, BMW will not only be able to attract additional foreign suppliers to the region, but also will be more likely to invest more in upgrading and developing local suppliers which the company might use in the future. As it stands, BMW is currently bridging the gap between its strategic needs and the territorial assets in the form of local supply companies through a 'mediated' process of technology transfer and industrial upgrading.

For example, in order to secure local sourcing for side glass for its E46 cars assembled in Thailand, BMW approached a supplier they used elsewhere. However, the negotiations failed and since production volumes were too low to persuade its German glass supplier to locate in Rayong, BMW went to the Thai subsidiary of a Japanese glass manufacturer and arranged a technological cooperation process between the German supply company and the Japanese/Thai manufacturer to upgrade and technically release their products and processes. That way, the German supplier became the main facilitator of technology and know-how transfer, based on long-term relations and familiarity with BMW's technical and organizational standards, without BMW having to deal with double investments. A similar, triangular technology transfer arrangement exists between BMW, one of their European suppliers and a domestic, fully Thai-owned supplier. That way, technological rents are generated within the Thai auto cluster, although to date they are still rather confined to joint ventures and foreign-owned suppliers.

Summing up, in order to achieve the goal of upgrading, a number of adjustments are needed to facilitate a positive strategic coupling process between global production networks and regional assets. These include efforts by the Thai govern-

ment to create regional institutions that help to transform and enhance the regional assets, especially in the field of education and vocational training, laid out in the current Automotive Industry Master Plan, and progress in supra-national negotiations to pave the way towards an integrated production system, with the global forces of multinational companies like BMW and supra-national economic policy arrangements being the main drivers for regional development in Rayong and Samutprakarn.

As this empirical example has illustrated, regional development is strongly linked to external influences in the form of both non-firm institutions and economic actors (see Figure 3). While the activation of endogenous resources to foster sustainable development is an important task for regional economic policy, it is not sufficient in itself but rather has to take into account the strategic coupling process between global production networks and regional assets. Figure 3 shows a strong intra-regional connectivity between actors for the region of Eastern Bavaria, both in terms of material flows and technological/organizational cooperation, supported by regional institutions. However, the main drivers of development are extra-local, based on BMW's production strategy and investment, while previous policy decisions and subsequent capital flows from the Bavarian and Federal Governments helped kick-start regional development. The BMW-linked production network in the Rayong/Samutprakarn area, on the other hand, currently shows comparatively few regional linkages. Most of the parts and components are imported from Germany via the Wackersdorf logistics centre, and investment as well as technology transfer to Thai suppliers has so far been rather modest. Additionally, the future of a prospering automotive cluster at Thailand's Eastern Seaboard depends to a large extent on supra-national free trade negotiations, making the international dimension of regional development ever more obvious.

## Conclusion

In this paper we have proposed an integrated conceptual framework for 'globalizing' regional development that takes external or 'global' forces as well as regional assets into account. In short, our framework highlights the dynamic 'strategic coupling' of global production networks and regional assets, an interface that is crucially mediated by a

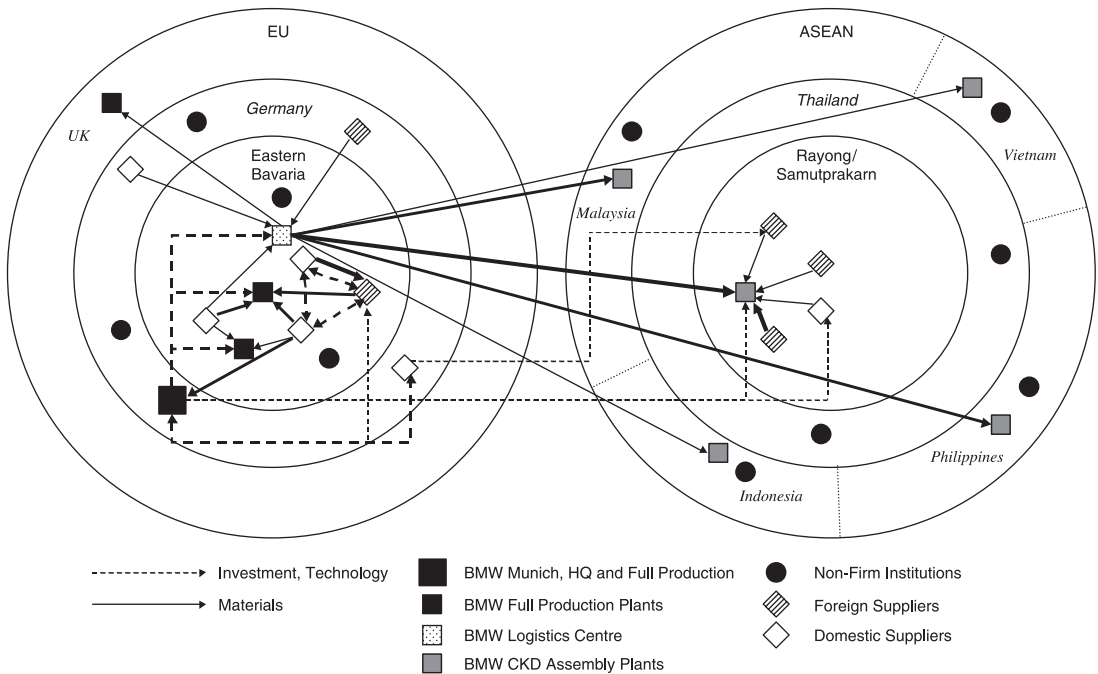


Figure 3 BMW's GPN and regions in the EU and ASEAN

range of institutional activities across different spatial scales. Our key argument is that regional development depends on the ability of this coupling mechanism to facilitate processes of value creation, enhancement and capture. Empirically, due to the constraints of space, we have only been able to offer a brief illustration of how our framework might be mobilized for a very simple global production network configuration consisting of one firm's activities across two regions. However, the BMW case clearly shows that the developmental impact of the coupling process is highly variable and contingent, and by no means automatically beneficial for the region.

Clearly, regional development does not take place on a level playing field. For the processes of value creation, enhancement and capture to benefit economic development in particular regions, the balance of power between the different actors involved is a crucial variable in determining the potential for value enhancement and, ultimately, value capture. Governance structures in different territorial contexts are variable and hence the possibilities for developmental policies to impact on a region's assets will differ as well. In many of

the newly industrialized countries, national politics sets the dominant framework for regional development, with regional institutions often weakly developed or completely missing. On the other hand, in countries with a more decentralized structure, regional institutions attempt to develop their bargaining power *vis-à-vis* focal firms in the context of nation-state governance structures and inter-regional competition. In every case, however, the exercise of power is a *multi-scalar* process, with varying combinations of actors cooperating or playing off one against the other. Knowledge about these territorially specific power configurations, therefore, is elementary for regional institutions to take appropriate measures for transforming a region's assets and to maximize their bargaining power and impact.

More specifically, what policy lessons might be drawn from our analysis for actors at the regional level? Four are particularly pertinent, although they can only be mentioned here because of space constraints. Firstly, policymakers clearly need to accumulate considerable stocks of knowledge not only about the various assets contained within their region, but also about how they relate to the

needs of various global production networks, many of which will originate outside their territory. Secondly, such knowledge is clearly sectorally specific, and effective policy interventions will have to be designed for, and targeted at, particular segments of particular industries. Such flexibility would appear to be a necessary precondition for effective intervention in the contemporary era. Thirdly, 'out there' knowledge clearly needs to extend beyond the needs of specific production networks to incorporate a reflexive understanding of the multi-scalar institutional configurations in which all policymakers are situated. Some of these institutional relations will pull against a particular endeavour, whilst others will support it. An appreciation of this complexity is a crucial first step in appropriately harnessing (or resisting) extra-local connections. Finally, it is clear that policy interventions need to be underpinned by an awareness of the differences between value creation, enhancement and capture, so that strategic couplings that prioritize the latter two processes can be identified and supported. All of these are policy issues that require substantial attention in future work on regional development in a globalizing world.

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## Notes

1 Our notion of 'strategic coupling' here may appear to resonate quite closely with the coupling process between the mode of social regulation and regime of accumulation in the French regulationist theory of economic development (see Boyer 2000; Tickell and Peck 1992) and its refinement through Jessop's (1990 2001) strategic-relational approach to state theory. However, our use of the concept is not a direct import from the regulationist theory that focuses primarily on the coupling process of two meta-structures within particular national economies (i.e. the national scale). At the risk of developing a functionalist interpretation of regional development, we use the term to characterize the very complex scalar juxtapositions that drive

regional development processes. While we acknowledge the term is imperfect and may be perceived as a rather crude structural interpretation of regional development, it is used here for heuristic purposes and should be understood as the coupling process between regional economies and global production networks that is mediated through specific action and practices of key actors and institutions. In this sense, we hope to offer a middle-ground interpretation that is both structural and actor-centric.

- 2 A brief note on methodology. This illustrative case study is derived from the ESRC funded project *Making the Connections: Global Production Networks in Europe and East Asia* (Grant # R000238535) that ran from 2000 to 2003 and explored economic connections within and between Europe (including Central and Eastern Europe) and East Asia in three sectors: auto components, retailing and telecommunications. Framed within the GPN conceptual framework (Henderson et al. 2002), over 150 semi-structured corporate and institutional interviews were conducted in 12 countries in addition to an extensive programme of secondary data and documentary analysis. The aim of the research was both to 'map out' leading GPNs in these three sectors and to explore their developmental impacts in different localities.

## References

- Allen J 2003 *Lost geographies of power* Blackwell, Oxford
- Allen J, Massey D and Cochrane A 1998 *Rethinking the region* Routledge, London
- Amin A 2002 Spatialities of globalisation *Environment and Planning A* 34 385–99
- Amin A and Thrift N 1992 Neo-Marshallian nodes in global networks *International Journal of Urban and Regional Research* 16 571–87
- Amin A and Thrift N 1994 Living in the global in Amin A and Thrift N eds *Globalisation, institutions and regional development in Europe* Oxford University Press, Oxford 1–22
- Bair J and Gereffi G 2001 Local clusters in global chains: the causes and consequences of export dynamism in Torreon's blue jeans industry *World Development* 29 1885–1903
- Bangkok Post 2003 *Year-end economic review* Bangkok, Thailand
- Benner C 2003 Labour flexibility and regional development: the role of labour market intermediaries *Regional Studies* 37 621–33
- Boyer R 2000 The political in the era of globalization and finance: focus on some *Régulation* school research *International Journal of Urban and Regional Research* 24 274–322
- Bunnell T G and Coe N M 2001 Spaces and scales of innovation *Progress in Human Geography* 25 569–89
- Castree N, Coe N M, Ward K and Samers M 2004 *Spaces of work: global capitalism and geographies of labour* Sage, London

- Chew Y-T and Yeung H W-C** 2001 The SME advantage: adding local touch to foreign transnational corporations in Singapore *Regional Studies* 35 429–46
- Clark G L, Mansfield D and Tickell A** 2002 The German social market in the world of global finance: pension investment management and the limits of consensual decision-making *Transactions of the Institute of British Geographers* 27 91–110
- Coe N M and Bunnell T** 2003 'Spatializing' knowledge communities: towards a conceptualization of transnational innovation networks *Global Networks* 3 437–56
- Dicken P** 1976 The multiplant business enterprise and geographical space: some issues in the study of external control and regional development *Regional Studies* 10 401–12
- Dicken P** 1994 Global-local tensions: firms and states in the global space economy *Economic Geography* 70 101–19
- Dicken P** 2003 *Global shift* 4th edn Sage, London
- Dicken P** 2004 Geographers and 'globalization': (yet) another missed boat? *Transactions of the Institute of British Geographers* 29 5–26
- Dicken P and Malmberg A** 2001 Firms in territories: a relational perspective *Economic Geography* 77 345–63
- Dicken P, Kelly P F, Olds K and Yeung H W-C** 2001 Chains and networks, territories and scales: towards a relational framework for analysing the global economy *Global Networks* 1 89–112
- Dore R** 2000 *Stock market capitalism, welfare capitalism: Japan and Germany versus the Anglo-Saxons* Oxford University Press, Oxford
- Gereffi G** 1994 The organization of buyer-driven global commodity chains: how US retailers shape overseas production networks in **Gereffi G and Korzeniewicz M** eds *Commodity chains and global capitalism* Praeger, Westport CT 95–122
- Gereffi G** 1996 Global commodity chains: new forms of co-ordination and control among nations and firms in international industries *Competition and Change* 1 427–39
- Gereffi G and Kaplinsky R** eds 2001 The value of value chains: spreading the gains from globalization *IDS Bulletin* 32
- Gereffi G, Humphrey J, Kaplinsky R and Sturgeon T** 2001 Introduction: globalisation, value chains and development *IDS Bulletin* 32 1–8
- Henderson J, Dicken P, Hess M, Coe N and Yeung H W-C** 2002 Global production networks and the analysis of economic development *Review of International Political Economy* 9 436–64
- Herod A** 2001 Labor internationalism and the contradictions of globalization: or, why the local is sometimes still important in a global economy *Antipode* 33 407–26
- Hess M** 2001 Globalisierung und regionale Innovationsnetzwerke: Beispiele für 'Glokalisierung' in der deutschen Fahrzeugindustrie in **Schätzl L and Grotz R** eds *Regionale Innovationsnetzwerke im internationalen Vergleich* LIT, Münster 83–100
- Hudson R** 2001 *Producing places* Guilford, New York
- Humphrey J** 2001 *Opportunities for SMEs in developing countries to upgrade in a global economy* (<http://www.ids.ac.uk/ids/global/pdfs/clusterchainsv4.pdf>) Accessed 7 February 2003
- Humphrey J and Schmitz H** 2000 *Governance and upgrading: linking industrial cluster and global value-chain research* Institute of Development Studies, University of Sussex, IDS Working Paper 120
- Jessop B** 1990 *State theory: putting capitalist states in their place* Polity Press, Cambridge
- Jessop B** 2001 Institutional re(turns) and the strategic-relational approach *Environment and Planning A* 33 1213–35
- Jones M** 1999 *New institutional spaces: TECs and the remaking of economic governance* Jessica Kingsley, London
- Kaplinsky R** 1998 *Globalisation, industrialisation and sustainable growth: the pursuit of the nth rent* Institute of Development Studies, University of Sussex, IDS Discussion Paper 365
- Kelly P F** 2002 Spaces of labour control: comparative perspectives from Southeast Asia *Transactions of the Institute of British Geographers* 27 395–411
- Lauridsen L** 2003 The role of the state in linkage formation between TNCs and local Thai enterprises Paper presented at the workshop on 'Understanding FDI-assisted Economic Development' 22–25 May 2003 TIK-centre, University of Oslo
- Lecler Y** 2002 The cluster role in the development of the Thai car industry *International Journal of Urban and Regional Research* 26 799–814
- Lovering J** 1999 Theory led by policy: the inadequacies of the 'New Regionalism' *International Journal of Urban and Regional Research* 23 379–95
- Lukes S** ed 1986 *Power* Blackwell, Oxford
- MacKinnon D, Cumbers A and Chapman K** 2002 Learning, innovation and regional development: a critical appraisal of recent debates *Progress in Human Geography* 26 293–311
- MacLeod G** 2001a New regionalism reconsidered: globalization and the remaking of political economic space *International Journal of Urban and Regional Research* 25 804–29
- MacLeod G** 2001b Beyond soft institutionalism: accumulation, regulation, and their geographical fixes *Environment and Planning A* 33 1145–67
- Massey D** 1978 In what sense a regional problem? *Regional Studies* 13 233–43
- Massey D** 1984 *Spatial divisions of labour* Macmillan, London
- Nohria N and Ghoshal S** 1997 *The differentiated network: organizing multinational corporations for value creation* Jossey-Bass, San Francisco
- Pauly L W and Reich S** 1997 National structures and multinational corporate behavior: enduring differences in the age of globalization *International Organization* 51 1–30



- Peck J** 1996 *Workplace: the social regulation of labor markets* Guilford, New York
- Peck J** 2000 *Workfare states* Guilford, New York
- Phelps N and Raines P** eds 2003 *The new competition for inward investment: companies, institutions and territorial development* Edward Elgar, Cheltenham
- Phelps N, Lovering J and Morgan K** 1998 Tying the firm to the region or tying the region to the firm: early observations on the case of LG in South Wales *European Urban and Regional Studies* 5 119–38
- Pries L** 2002 5000x5000: Ende gewerkschaftlicher Tarifpolitik oder innovativer betrieblich-tariflicher Sozialpakt? *Industrielle Beziehungen* 9 222–35
- Scott A J** 1988 *New industrial spaces* Pion, London
- Scott A J and Storper M** 2003 Regions, globalization, development *Regional Studies* 37 579–93
- Simmie J** 2003 Innovation and urban regions as national and international nodes for the transfer and sharing of knowledge *Regional Studies* 37 607–20
- Smith A, Rainnie A, Dunford M, Hardy J, Hudson R and Sadler D** 2002 Networks of value, commodities and regions: reworking divisions of labour in macro-regional economies *Progress in Human Geography* 26 41–63
- Storper M** 1997 *The regional world: territorial development in a global economy* The Guilford Press, New York
- Sturgeon T** 2001 How do we define value chains and production networks? *IDS Bulletin* 32 9–18
- Techakanont K** 2003 *Globalization strategy of assemblers and changes in inter-firm technology transfer in the Thai automobile industry* Working paper series vol 2003-23 The International Centre for the Study of East Asian Development, Kitakyushu
- Tickell A and Peck J** 1992 Accumulation, regulation and the geographies of post-Fordism: missing links in regulationist research *Progress in Human Geography* 16 190–218
- Tucher M v** 1999 *Die Rolle der Auslandsmontage in den internationalen Wertschöpfungsnetzwerken der Automobilhersteller* VVF, Munich
- Yoshimatsu H** 2002 Preferences, interests, and regional integration: the development of the ASEAN industrial cooperation agreement *Review of International Political Economy* 9 123–49