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Dynamics of Global Production Networks:
An East Asian Perspective**

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Working Paper Series Vol. 2006-15
September 2006

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Situating Regional Development in the Competitive Dynamics of Global Production Networks: An East Asian Perspective

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Abstract: The debate on the nature and dynamics of regional development in both academic and policy circles has now moved on from the earlier focus on endogenous regional assets to analyzing the complex relationship between globalization and regional change. This paper attempts to engage with this debate through the experience of regional development in East Asia. The East Asian perspective shows that regional development cannot be understood independently of the changing dynamics of global production networks. While the existing literature on East Asia tends to focus on the state as the key driver of economic development at the national and regional levels, I argue that the developmental state is a necessary but not sufficient condition for regional development to take place. Instead, we need to study the complex *strategic coupling* of those economic actors, particularly large business firms, operating in specific regions in Asia with their lead firm counterparts orchestrating production networks on a global basis. To illustrate these strategic coupling processes and their impact on regional trajectories, I draw upon primary data collected through personal interviews with over 70 leading Asian firms. The paper concludes with some major implications for theorizing regional development and strategic policy options.

Keywords: Regional development, global production networks, strategic coupling, Asia, business firms.

Acknowledgement

The NUS Academic Research Fund (R-109-000-050-112) supports the research project underpinning this paper. I am grateful to my research collaborators, Jang-sup Shin and Yong-Sook Lee, for their significant intellectual inputs, and to Angela Leung for her excellent research assistance. The paper was written while I was a Visiting Researcher at the International Centre for the Study of East Asian Development (ICSEAD), Kitakyushu, Japan, during July-September 2006. I am very grateful to ICSEAD for its generous Visiting Researcher scheme and excellent research facilities. I am solely responsible for the content of this paper. The author may be contacted at: HenryYeung@nus.edu.sg

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1. Introduction

Regional development has been a thorny conceptual and empirical issue in regional studies. Some three decades ago, Dicken (1976) and Massey (1979; 1984) pioneered the idea of understanding regional development *in relation* to extra-regional processes. To Dicken (1976), these processes were significantly linked to the extent of corporate control exercised extra-regionally by a nascent form of transnational corporations (TNCs) – the multiplant business enterprise (or now commonly understood as “multi-domestic” operations). Massey (1979; 1984), on the other hand, was primarily concerned with the dynamic relationship between inter-regional social relations of production and successive waves of (foreign) investment – what she termed “spatial divisions of labour”. Clearly, both major contributions pointed to the role of extra-regional processes in shaping the trajectories and dynamics of regional development. This important lesson, however, seems to have been forgotten in the “new regionalism” literature that has dominated regional studies since the 1990s (see Scott and Storper, 2003; Legendijk, 2006). Drawing upon the paradigmatic examples of Silicon Valley, the Third Italy, and Baden-Württemberg, proponents in this new literature have placed a great deal of emphasis on localized agglomerations and institutional structures as both necessary and sufficient conditions to account for regional growth and development.

Situated in the above historiographical context, this paper attempts to revisit the role of *extra-regional processes* in shaping regional development trajectories. This task is an important one as the debate on the nature and dynamics of regional development in both academic and policy circles has now moved on from the earlier focus on endogenous regional assets such as localized networks of association and trust to analyzing the complex relationship between economic globalization and regional change (Coe et al., 2004; Yeung,

2005a). In this paper, regions are defined as relatively enduring subnational territorial ensembles with their own political and administrative jurisdiction embedded within certain shared historical and socio-cultural formations. Think of Silicon Valley and the Third Italy as distinctive territorial ensembles with their respective sectoral specialization. Regions are not closed or bounded systems though, as these ensembles are increasingly permeable in a globalizing era. Actors in regions actively construct all kind of discursive and material relations stretched well beyond their territorial boundaries. In this sense, I concur with Hudson's (2005: 620) relational view that regions should be "seen as constituted from spatialized social relations, stretched out over space and materialized in various forms, and representational narratives about them" (see also Amin, 2004).

The paper aims to engage with this debate on extra-regional processes in an era of globalization in relation to the experience of regional development in East Asia. The East Asian experience shows that regional development cannot be understood independently of the changing dynamics of global production networks (GPNs). While the existing literature on East Asia tends to focus on the developmental state as the key driver of economic development (Amsden, 1989; 2001; Wade, 1990; Weiss, 1998; 2003; Woo-Cumings, 1999; cf. Stiglitz and Yusuf, 2001; Boyd and Ngo, 2005; Doner et al., 2005), I argue that this developmental role of the national state is at most a necessary but not sufficient condition for regional development to take place. We need to study the complex *strategic coupling* of those economic actors, particularly business firms, operating in specific regions with their lead firm counterparts orchestrating production networks on a global basis. My emphasis on business firms and their embedded GPNs is a deliberate choice in order to overcome the excessive emphasis on regional assets in the new regionalism literature and state interventions in the East Asian development literature. In doing so, I hope to resurrect the firm as an important and active strategic player in shaping the regional landscape of global capitalism (see also

Markusen, 1994; 2004; Taylor and Asheim, 2001; Dicken and Malmberg, 2001; Yeung, 2005b). As McKendrick et al. (2000: 254) have noted, “firms play the lead role in the construction of clusters and regional production systems – in effect, constituting economic space”.

This revision of the Asian developmental state literature is necessary and timely for two reasons (see also Doner et al., 2005). First, the literature has consistently downplayed the active role of leading Asian firms in regional development. Reflecting on the “market versus state debate” in understanding regional development in Asia, Hobday (2001: 25) observes that “because of the dominance of this debate, there are few studies which derive ‘bottom-up’ policy conclusions from firm-level studies. The activities and strategies of firms in engaging with international production networks cannot be properly accounted for within theories of the developmental state, as latecomer firm behaviour tends to be treated (usually implicitly) as an automatic response to policy and economic circumstances, rather than as a shaping influence in its own right”. Second, the role of the developmental state from the early 1990s onwards, particularly since the 1997/1998 Asian economic crisis, has been much less “developmental” and much more “regulatory” (see also Stiglitz and Yusuf, 2001). This is evident in the changing role of the state in three Asian newly industrialized economies (NIEs) of South Korea (restructuring and regulating the *chaebols*), Taiwan (regulating cross-Straits activities of Taiwanese firms), and Singapore (market liberalization, policy deregulation, and privatization of government linked companies).¹

In making the above arguments, I have three important caveats that need to be stated upfront here. First, my point about the strategic coupling of local firms with lead firms in GPNs is not a functionalist argument (see also Henderson et al., 2002; Coe et al., 2004: endnote 1). This coupling process is not automatic and always successful; it needs to be unpacked and analyzed because it changes over time and in different geographical contexts.

Moreover, the enabling mechanisms and technologies for this coupling may be highly uneven geographically. For example, while airfreight services account for around 40% of world trade by value (Bowen and Leinbach, 2006: 148; see also Leinbach and Bowen, 2004), access to supply chain management and third-party logistics services varies dramatically between firms in different regions (Heaver, 2004).

Second, the uniqueness of East Asian experience in regional development should be underscored here, primarily because of the simultaneous presence of three key ingredients – local firms (public or private), developmental state institutions (often at the national level), and lead firms and GPNs (see Yusuf et al., 2004). In comparison, these three ingredients occurred during different historical moments of regional development in North America and Western Europe. When American investment ventured into Western Europe, particularly the UK, after World War Two, developmental state institutions were mostly absent and these American firms were established as multi-domestic clones rather than complex GPNs. Since the mid-1980s, regional devolution in North America and European countries has intensified, though the outcomes are rather mixed (Rodríguez-Pose and Gill, 2004). In East Asia, regional development trajectories are much more variegated, ranging from Japan's active pursuit of regional equality policies during post-war development to the strong focus in South Korea and Taiwan on building up national institutional capacity between the 1970s and the 1990s and the more recent experimentation of China with regional devolution since the late 1980s (e.g. Zhang and Wu, 2006).

Third, this paper is not concerned with the governance rescaling debate in geography and regional studies that views regional devolution as an outcome of rescaling of political governance in nation-states and macro-regions (see Goodwin and Painter, 1996; Swyngedouw, 2000; Brenner et al., 2003; Jones et al., 2005; cf. Mansfield, 2005). In this debate, the analytical focus is particularly concerned with the *politics* and *policy instruments*

of such rescaling processes, less so with how regions become more articulated into the global economy through GPNs (cf. Coe et al., 2004).

This paper is organized into four sections. The next section theorizes the strategic coupling processes between regions and lead firms in GPNs. This conceptual development draws upon recent theoretical advances in studies of GPNs associated with the Manchester School in economic geography and regional studies (see Dicken et al., 2001; Henderson et al., 2002; Coe et al., 2004; Yeung, 2005a; Hess and Yeung, 2006). Having theorized and identified these strategic coupling processes, this paper proceeds to illustrate how these processes shed light on the different trajectories of regional development in East Asia in the third section. Based on primary data collected from personal interviews with over 70 Asian NIEs firms², this analysis shows that the strategic coupling of these Asian firms with lead firms in GPNs matters significantly in accounting for diverse trajectories of regional development. The final section offers some concluding remarks and major implications for theory and policy.

2. Strategic coupling: regional development in the context of globalization

From the above contextualization of the different strands of regional studies literature, it is clear that the focus on the importance of extra-regional processes in shaping regional development outcome is in itself nothing particularly new (cf. Dicken, 1976; Massey, 1979; more recently, Phelps and Fuller, 2000). The novelty of the GPN approach, however, rests with its emphasis on the strategic coupling process between local firms in particular regions and global lead firms in GPNs. This firm-specific approach differs significantly from the earlier work that focused on the external dependency of regions and therefore the passivity of local firms in responding to external control. In the new regionalism literature, on the other hand, there is too much glorification of local networks of small and medium enterprises

(SMEs) and associational economies (see a critical evaluation in Lovering, 1999; MacLeod, 2001; Coe et al., 2004). A more recent incarnation of this literature tends to focus on so-called “regional innovation systems” (see Braczyk et al., 1997; Fornahl and Brenner, 2003; Morgan, 2004). In either strands of literature, inadequate attention has been paid to the interconnections between these “external” global firms and their “local” counterparts – often mistaken as SMEs, even though some of them have grown to become major global players in their own right.

In this section, I first explain how regional development should be seen as a form of *trans-local* dynamic. I then bring in global lead firms and show how regions become incorporated into their global production networks through the process of strategic coupling. Some key mechanisms facilitating this coupling process are described and explained. Taken together, this GPN approach to regional development goes beyond the new regionalism literature through a consideration of economic-geographical processes occurring at multiple scales – from local and regional to national and global (see also Hudson, 1999; 2005; MacLeod, 2001; Hadjimichalis, 2006). This explicit attention to multi-scalar processes of regional development represents an intentional challenge to the recent rise of the so-called new regionalism rhetoric in which *intra-regional* processes are championed as the universal panacea for regional development. As noted by Hudson (2005: 620) in the European context, for example, “there is a wealth of evidence of people seeking to construct regions as if they were closed, bounded and coherent, with shared and unified regional interests”. In the US case, Jonas and Pincetl (2006: 487) have described American regionalist rhetoric and concerns as “prosaic” and “atheoretical” that have historically been seeking to uncover the optimal size and function of the (regional) state.

Several recent geographical studies of Italy’s Veneto region (Bialasiewicz, 2006), northeast England (Hudson, 2005), and California (Jonas and Pincetl, 2006) have clearly

pointed out how regional devolution and the valorization of local networks of trust are manifested in regionalist politics and localist rhetoric. This narrow-minded championing of intra-regional issues can be dangerous and inward-looking. As Bialasiewicz (2006: 46) argues, “the fortunes [of the Veneto] could not have been made without the global market and its hypermodern thirst for innovation, a thirst that Veneto entrepreneurs have been masterful in exploiting”. She validly questions regionalist assertions that “all there was to the Veneto model was ‘hard work and creativity’: the region was a ‘self-organising system’, its success a result of ‘spontaneous organisation’”. In a similar vein, Hadjimichalis (2006: 85) reflects critically on the Third Italy discourse and points to the discourse’s “failure to take into account the wider national, European and global system of capitalist price relations within which these small firms operate”. He is particularly troubled by the explanation of Third Italy’s success on the basis of “‘internal’ factors only, by their ‘embedded tacit knowledge’, while the rest of Italy and the world are reduced to simple consumers of their fashion products”. He further relates the success of Third Italy in the textile and clothing industry to favourable state policies in lowering exchange rates and tax liabilities of small firms, macro-economic protectionist regulations and labour legislations, and the globalization of lead Italian firms through vertical integration of their value-chain activities (see also Dunford, 2003; 2006). Instead, he calls for “the need to extend the analytical focus from a bounded territorial system of production to an unbounded, scalar spatial system in which both local and international relations are taken into account” (Hadjimichalis, 2006: 102-103; see also Hudson, 2005; 2006).

This recent shift of analytical attention from focusing on successful intra-regional ingredients *à la* the new regionalism and regional innovation literature to the complex interrelationships between local/regional actors and global processes does not represent a straightforward return to the kind of work associated with external control (Dicken, 1976) and

social relations of production (Massey, 1979; 1984). Instead, it builds on this earlier strand of literature and focuses on a *relational understanding* of the evolution of local and regional firms and their dynamic articulation in global production networks – what is now broadly recognized as a “relational turn” in regional studies and economic geography (Amin, 1998; Bathelt and Glückler, 2003; Boggs and Rantisi, 2003; Coe et al., 2004; Yeung, 2005a; Bathelt, 2006). In this relational approach to “globalizing” regional development, we typically start our analysis of a region’s development trajectory *in relation* to complex dynamics in respective global production networks. While I will examine empirically in the next section how business firms in selected East Asian regions have risen and played an important role in GPNs, the remaining parts of this section tackle two major theoretical issues: (1) why do global lead firms in GPNs become interested in what Storper (1997: 26) has termed the “holy trinity” of regional economies –technology, organizations, and territories and (2) how do key actors in specific regions become strategically coupled with the imperatives of these lead firms in GPNs?

Lead firms in global production networks

By global lead firms, we mean powerful firms that orchestrate and coordinate complex GPNs in their respective industries that span different territories and regions. Inadvertently, these lead firms are large transnational corporations that in turn are movers and shapers of the global economy (Harrison, 1997; Peck and Yeung, 2003; Gereffi, 2005; Dicken, 2007). They are often market leaders in terms of their brand names, technology, products, and marketing capabilities. Good examples are Hewlett-Packard and Motorola in information and communication technology (ICT) industries, Sony and Philips in consumer electronics, Toyota and General Motors in automobile, The Gap and Nike in clothing and footwear, Citicorp and HSBC in banking, Hilton and Marriott in hospitality, British Airways and

Lufthansa in airlines, and so on. In the manufacturing sector, global lead firms often specialize in the upstream activities of research and development and downstream activities of branding, marketing, and post-sale services. While they continue to engage in high-value manufacturing activities, these global lead firms are increasingly compelled to outsource a large portion of their product categories to independent manufacturers (e.g. IT, clothing and garment, toys and footwear, machinery industries). There is thus a movement of global lead firms towards market control via product and market definitions, rather than leadership in manufacturing processes and technologies.

While most of these global lead firms are original equipment manufacturers (OEMs), their manufacturing partners are often described in different ways – OEM subcontractors, original design manufacturers (ODMs), and electronic manufacturing service (EMS) providers. OEM subcontractor relationships tend to be most prevalent in labour-intensive industries, whereby the OEM customers supply design and product specifications to their subcontractors that take care of the manufacturing process. In EMS and ODM arrangements, global lead firms rely on the design, manufacturing, and logistic services of their strategic partners. As noted by Sturgeon and Lester (2004: 43),

Today, suppliers must provide a capability for independent process development and an ability to perform a wide range of value adding functions associated with the manufacturing process, including help with product and component design, component sourcing, inventory management, testing, packaging, and outbound logistics. Lead firms are also demanding that suppliers have the ability to support the lead firm's operations and market-serving activities around the world.

These EMS and ODM partners may also engage in separate subcontractors for the manufacture of different parts and components of products that they assemble for global lead firms. The finished products, however, continue to bear the trademarks and brand names of global lead firms. This lack of product/market control explains why EMS and ODM providers cannot be seen as lead firms in their own right, even though many of them are very large

TNCs in their own right (see the next section). At the very most, they are strategic partners of global lead firms that are brand name companies with or without OEM capability.

In the service sector, global lead firms are particularly dominant in industries that are global in scope and operations (e.g. transport, finance, producer services, and hospitality). In these service industries, there is a great deal of global integration coordinated by these service lead firms. They therefore generate substantial demand for globally integrated services from their suppliers and providers, e.g. logistics, maintenance, materials, and so on. This demand for global integration in both operations and suppliers is explained by the necessity of ensuring quality consistency on a global scale. This in turn provides opportunities for globally integrated service suppliers that can “follow” their customers.

As their markets and competitors are becoming increasingly global, these lead firms in manufacturing and service GPNs are driven by three competitive dynamics that have profound consequences for regional development: cost, flexibility, and speed. The perennial drive towards lowering cost is now an established idiom in the economics and Marxian analysis of industrial competition. To Harvey (1982) and Smith (1984), this competitive pressure results in capital’s ruthless adoption of a “spatial fix” that see divestment and investment in different regions in relation to the ebbs and flows of capital. Regions suffering from high cost reluctantly witness the unfolding of processes of deindustrialization, whereas lower cost regions gain new investment through the emergence of so-called “new international division of labour” (Fröbel et al., 1980). This process of spatial fix is best observed in the international relocation of much of European and American manufacturing activity to East Asia during the past four decades (e.g. Henderson, 1989; McKendrick et al., 2000; Ernst, 2005; Feenstra and Hamilton, 2006).

While this spatial fix can alleviate, at least temporarily, the cost problem of global lead firms, it is clearly not a long-term solution to their competitive plight. As the saying goes,

there will always be someone who can do it cheaper. As shown by perceptive scholars of business competition (Schoenberger, 1997; Mathews, 2005; 2006a), two other firm-specific dynamics – flexibility and speed – may play a much more important role than previously understood in the regional studies literature. In order to compete more effectively in today’s global economy, lead firms begin to opt for what can be broadly termed an “organizational fix”. Lead firms now realize that competitive advantage can be obtained through a more *flexible* and efficient form of organizing production on a global scale. This idea of an organizational fix must be distinguished from the earlier notion of a spatial fix.

Reorganization of production networks does not necessarily entail spatial relocation of production, particularly one’s own production facility. Instead, an organizational fix results primarily from a choice of different *business strategies*; it is about strategizing the organizational principle that affords the most competitive advantage. The strategy of outsourcing, for example, represents an organizational fix through which global lead firms are able to increase their production flexibility without incurring substantial liability in owning manufacturing or service facilities. The rise of OEM, ODM, and EMS arrangements can therefore be interpreted as important organizational fixes for global lead firms. Through these arrangements, production networks become more globally oriented and integrated, leading to the emergence of sophisticated global production networks orchestrated by global lead firms.

The search for low cost production locations and the creation of organizational economies do not capture fully the problem of competitive dynamics in an era of globalization. As noted by Harvey (1989), time-space compression has compelled capitalist firms to accelerate their capital accumulation processes. To Schoenberger (1997; 2000) and Sheppard (2002), this competitive pressure has substantially increased the demand for *time-to-market* as a tool of winning market shares. Apart from organizational flexibility, the adoption of technological solutions can significantly improve a lead firm’s time-to-market

capability. This approach can be termed a “technological fix” that entails the critical role of technology in the competitive dynamics of lead firms in GPNs. In the electronics industry, for example, information technology (IT) solutions and global electronic platforms have undoubtedly contributed to the successful organization of production networks on a global scale by lead firms. Such a technological fix can be seen in IT solutions such as electronic data interchange (EDI) with customers and suppliers, internet-based integration of manufacturing processes and enterprise resource planning (ERP) systems, and global tracking systems with third party logistics (3PL) providers (see Lüthje, 2002; Macher et al. 2002). This technological fix results in the vertical disintegration and the subsequent vertical specialization of production in the ICT industry. Its implication for regional development is highly contingent on the strategies of lead firms and their changing organization of GPNs. Lüthje (2002: 228) thus argues that “there may emerge *different trajectories of technological learning* depending on the position of particular districts or regions within the international division of labor in the production networks of the respective industries”. Taken together, the impact of these three fixes on regional development is critically dependent on the ways in which local and regional firms in these regions are articulated into GPNs – a process termed “strategic coupling” in this paper.

Strategic coupling in global production networks

Now that I have clarified the nature and competitive dynamics of lead firms in coordinating GPNs, I can begin to situate *regions* in these GPNs through a relational perspective (see Yeung, 2005a). Both regions and GPNs, however, are relational constructions and social formations that are constituted through ongoing actor-specific practices and processes; they are not some kind of autonomous actors capable of effecting spatial change. Instead, we need to focus on business firms – both global lead firms and their

strategic partners – as one important group of key actors that bring together regions and GPNs through their relational processes. This is where the concept *strategic coupling* becomes important.³ I define “strategic coupling” as a time-space contingent convergence of interests and cooperation between two or more groups of actors who otherwise might not act in tandem for a common strategic objective. This coupling process exhibits several distinctive attributes. First, it is strategic because the process does not happen without active intervention and intentional action on the part of the participants. As argued by Mathews (2006a), strategizing is most useful/profitable in a condition of disequilibrium. Second, it is time-space contingent as the coupling process is not permanent and is subject to change. It resembles a form of temporary coalition. Third, the convergence process transcends territorial boundaries and geographical scales, as actors from different spatial sites (states, regions, and localities) converge and their practices radiate out to diverse geographical scales – some global and some highly local. Overall, the concept explains *how* key actors in specific regions become articulated into the imperatives of lead firms in GPNs; it is about dynamic relational processes and mechanisms.

What then are these relational processes and mechanisms that facilitate the strategic coupling of local and regional firms with lead firms in GPNs? In the East Asian context, I will elaborate on three such processes: (1) the emergence of transnational communities; (2) changes in industrial organization; and (3) initiatives by states and institutions. These processes are chosen for their theoretical relevance and policy significance. The critical role of communities and social capital in regional development is now almost a taken-for-granted axiom in regional studies. Rodríguez-Pose and Storper (2006) have recently charted several theoretical evolutionary scenarios in economic development in relation to informal communities and formal institutions. While their analysis of communities is an important one, their dichotomous treatment of communities as informal and institutions as formal is a cause

for concern. For one, they do not recognize the possibility that social communities can be *both* informal and formal at the same time, obliterating their communities-versus-institutions dichotomy.

One such community refers to the transnational elite professionals and businesspersons in East Asia who shuttle constantly around the globe – though often along the East Asia-Vancouver/San Francisco corridor (see Olds, 2001; Coe et al., 2003). To Saxenian (2002; 2006), this *transnational elite community* has rewritten the concept of international knowledge formation from one of “brain drain” to a two-way process of “brain circulation”. Through their constant movements between different regions of the world, these Asian or Asian-origin technologists and entrepreneurs have formed a transnational community of informal “brain networks” characterized by certain common social identity and, sometimes, nationalistic sentiments. Yet, their transnational business practices have contributed to the *formal* coupling of firms in Asian regions with lead firms in GPNs through a variety of organizational arrangements. Saxenian (2002: 183 and 186; also 2006) thus argues that:

these communities have the potential to play an increasingly important role in the evolution of global production networks. Transnational entrepreneurs and their communities provide a significant mechanism for the international diffusion of knowledge and the creation and upgrading of local capabilities... [They] provide a direct mechanism for transferring the skill and tacit knowledge that can dramatically accelerate industrial upgrading in their developing countries. In addition they frequently coordinate relationships between the network flagships and suppliers, particularly when they are based in regions with differing languages and business cultures. This role ranges from helping to identify appropriate original equipment manufacturer (OEM) suppliers to facilitating the ongoing (and often face-to-face) inter-firm communications required by the rapid pace of change in the industry.

To elaborate on Saxenian’s important observation, we need to unpack better another critical coupling mechanism – changing industrial organization. As explained earlier, lead firms in GPNs are compelled to adopt organizational and technological innovations in order to “fix” their competitive problems. These fixes in turn create a new form of *industrial organization* that provides a window of opportunity for local and regional firms in Asia to

plug themselves into GPNs. Saxenian (2002: 184-185) observes that “The deepening social division of labor in the industry creates opportunities for innovation in formerly peripheral regions – opportunities that did not exist in an era of highly integrated producers”. In particular, the rise of *vertical specialization* by brand name firms and/or OEMs in many industries is linked to the vertical disintegration of value-chain activity within individual lead firms and the subsequent vertical reintegration of this activity in geographically dispersed locations. In the global electronics and ICT industry (see Figure 1), this process of vertical disintegration/reintegration provides a strategic coupling platform for local and regional firms in Asia to connect with lead firms in GPNs.

This process is also greatly facilitated by technological changes. Lee and Lim (2001) and Lee et al. (2005b), for example, show how rapidly emerging new technological paradigms in digital TV and mobile phones have created windows of opportunity for latecomer Asian firms to engage in leapfrogging. Primarily because of the capability, flexibility, response time, and cost competitiveness of domestic firms in particular East Asian industrial districts and high growth regions, this strategic coupling process operates to the benefits of both lead firms in GPNs and their Asian partners such as EMS and ODM providers and dedicated service providers (see more detail examples in the next section; also Yeung, 2007). Lüthje (2002: 228) notes that “Through their continuing acquisitions CM [EMS] companies act as transnational network builders, assembling a variety of plants with different manufacturing practices in specific national and global markets. Contract manufacturing, therefore, can be characterized as a mode of integrating, coordinating, and regulating diverging economic, social, and cultural conditions in global production systems”.

The availability of the above transnational communities and organizational-technological capabilities of local firms must be at least partially explained by the relentless efforts of *state institutions* in paving the way for this strategic coupling to take place. The

developmental state literature has already explained exactly what the East Asian states did in terms of industrial policies and fiscal incentives that helped groom the first generation Asian firms up to the late 1980s. The role of these state institutions during the past 15 years has been particularly important in enhancing human resources and physical infrastructure in respective industrial districts and growth regions. In 2002, for example, the total cost of an integrated circuit (IC) chip engineer in Asia is only 10-20% of that in Silicon Valley (see Ernst, 2005: Table 3). This is no doubt a positive outcome of state involvement in developing human resources and physical infrastructure. The outcome for regional development is staggering, as it stimulates both the relocation of chip design work from Silicon Valley and elsewhere in developed economies to leading clusters in Asia, and the growing cost competitiveness of leading Asian firms in chip design and engineering capabilities (see empirical examples below). Another role of state institutions in the strategic coupling between local firms and lead firms in GPNs has to do with the rapid growth of public-private R&D consortiums, particularly in Singapore, South Korea, and Taiwan. In the latter two economies, these consortiums are strategically located in high growth regions and they serve as a direct conduit to couple the strategic interests of both local high-tech firms and global lead firms. They also represent a form of state-sponsored collective action to reduce excessive competition among participating firms and to develop path-breaking technologies (Noble, 1998).

To sum up this section briefly, I have examined how regional development should be viewed as a trans-local dynamic process of growth and change, where multiple actors operate at a variety of geographical scales. The strategic coupling processes of these actors in different regions and locales constitute the central dynamic of regional development, as they bring together regions and GPNs in a recursive and cumulative process of growth and development. What remains to be seen in the next section is how these dynamic processes unfold in different regional development trajectories in East Asia.

3. Regional development trajectories in East Asia

Regional development is a major policy issue in East Asia. From China's Yangtze River Delta and Pearl River Delta, South Korea's Seoul Metropolitan Area, and Taiwan's Taipei-Hsinchu region to Malaysia's Penang and Selangor states and Thailand's Greater Bangkok region (see Figure 2), rapid industrialization and economic development are taking place at historically unprecedented rates on back of high export propensities. As shown in comparative data in Table 1, these growth regions have clearly stood out in relation to their growth rates and contributions to national economies. If we apply the standard analytical toolkit from the new regionalism literature and its regional innovation system variant, we will probably find it hard to explain these regional development trajectories (cf. Lundvall et al., 2006). For there is not much of the kind of "institutional thickness" (Amin and Thrift, 1994a), "associational economies" (Cooke and Morgan, 1998), and regional innovation systems present in Western European regions that find their ways to these propulsive regions in East Asia. There is also a visible absence of the kind of "relational assets" extensively discussed in Storper (1997) and Scott and Storper (2003), let alone some sort of "learning regions" capable of generating indigenous technologies and innovation (Asheim, 1996; Morgan, 1997; Simmie, 1997; Boekema et al., 2000; cf. Hudson, 1999; Bunnell and Coe, 2001). With the exception of perhaps the Taipei-Hsinchu region and the Seoul Metropolitan Area, none of the regions in East Asia fits the classic story in the new regionalism literature.

To account for regional development trajectories in East Asia, we need to look beyond growth dynamism generated endogenously from these regions and bear in mind the openness of regional formations. In this sense, the earlier discussion of global production networks and strategic coupling between regional and extra-regional actors becomes relevant and useful. While I am not concerned with the nitty-gritty of regional policies per se or the social and environment impact of sometimes imbalanced regional growth⁴, I intend to illustrate how

regions and regional development occur in East Asia in relation to the *strategic coupling* of local firms with lead firms in GPNs. In particular, I show two types of regional development trajectories and analyze their dynamics: (1) strategic coupling through international partnership and (2) strategic coupling through the provision of platforms for innovation and production. In both instances, my focus is on how local firms are articulated into the strategic imperatives of GPNs in respective high-growth industries.

Strategic coupling through international partnership

The Taipei-Hsinchu region and, to a certain extent, Singapore present two best examples on how regional development can occur through managing the strategic coupling of local firms with lead firms in GPNs.⁵ In both cases, development takes place through the direct articulation of the region into critical GPNs. In the Taipei-Hsinchu region, this articulation has taken the form of indigenous Taiwanese firms serving as strategic partners of lead firms in GPNs. In Singapore, lead firms have made a direct presence through inward foreign direct investment (FDI). This international partnership with global lead firms, either through transactional relationships or direct presence, brings tremendous growth dynamics and development potential to significant industries in both cases: the Taipei-Hsinchu region (e.g. electronics and ICT) and Singapore (electronics, chemicals, finance, and transport and logistics). Since the late 1990s, major firms from both Taiwan and Singapore are also leveraging their direct presence in the US for technological innovation and market development (see Poon and MacPherson, 2005; Poon et al., 2006; Hsu et al., 2007).

In Taiwan, state promotion of high tech ICT industries since the late 1970s and the early 1980s has led to a high degree of spatial concentration mostly in the northern region centred around Taipei (Mathews, 1997; 2006b; 2007; Hsu, 2005; see also Table 1). Taipei now hosts the headquarters of some 70% of Taiwan's top 50 ICT companies. My interviews

with top executives in some 19 of these top 50 ICT firms conducted between June 2004 and July 2005 show that they are not only all located in the Taipei-Hsinchu region. But they also constitute the top 50 largest Taiwanese firms in all sectors, measured by their turnover, market capitalization, and assets (see details in Yeung, 2007). Many of them are world's top 3 or top 5 players in their respective market niches, ranging from EMS providers and ODM system integrators (e.g. Hon Hai, Quanta, and Compal) to specialized components and services (e.g. TSMC, UMC, AU Optronics, and SPIL). These large Taiwanese ICT firms are highly innovative and perform an important role as strategic partners of global lead firms in the ICT GPN. Between 1980 and 2000, more than 60% of Taiwan's industrial patents were created in the Taipei-Hsinchu region (Hsu, 2005: 660). In 2001, Taiwan was ranked fourth on back of 6,545 patents granted by the US Patent and Trademark Office, just after three industrial giants of the US, Japan, and Germany and ahead of France and Britain (Chu, 2006: Table 4.12).

Through these large Taiwanese ICT firms, the Taipei-Hsinchu region is effectively coupled into the strategic shift of global lead firms in Silicon Valley towards high tech R&D activity and leaving much, if not all, of the manufacturing activity to these strategic partners in the Taipei-Hsinchu region. The story of regional success, however, does not end with state promotion efforts. In fact, a whole transnational elite community of professionals and entrepreneurs has emerged during the past two decades that contributes significantly to the successful strategic coupling of indigenous firms in the Taipei-Hsinchu region with their global lead firm customers (see Hsu and Saxenian, 2000; Saxenian and Hsu, 2001; Saxenian, 2006). The previous professional experience of these transnational elite entrepreneurs in global lead firms is highly important to this strategic coupling process. Classic examples are Macronix's founder Miin Wu who worked in Siliconix and Intel and was a founding member of VLSI Technology, and TSMC's founder Morris Chang who worked for Texas Instruments

(Interviews with Macronix and TSMC in Taipei, July 2004; see also Liu et al., 2005). In both cases, their personal experience is useful not only in helping them develop strong links with their former employers, but more important in allowing them to learn best management and manufacturing practices. For example, Macronix's Miin Wu learnt from his Intel experience how to manage business focus:

Having a real product out is very time consuming and very demanding. So within these 2 years (2001-2002), we have nothing coming out. And nobody knows what's going on. Suddenly [our] technology was behind, and the product was losing money, because we don't have new product to begin with... Suddenly we became very hard. I think what I learned is the focus, how you execute it, give people a sense of urgency. So that's what we learned. That's what is happening gradually. But if you look at every company, I worked for Intel, and other companies; for first 10 years, even Intel three times they almost got under. They run out of money, they are not making money... but it's good for them because they know it's not easy. The first 10 yrs, execute perfectly, and then start losing (Interviewed in Taipei, 9 July 2004).

This strategic coupling process does not end with the Taipei-Hsinchu region. During the past five to ten years, these transnational professionals and entrepreneurs from the region are extending their spatial reach into selected regions in China, e.g. the Yangtze River Delta and the Pearl River Delta. The Silicon Valley-Taipei/Hsinchu connection becomes enlarged into what might be termed a triangular connection that incorporates Shanghai, the "dragon head" of the Yangtze River Delta, into its operating orbit. Echoing Leng's (2002) views, Hsu (2005: 661) observes that:

a triangle connection between Silicon Valley–Taipei (Hsinchu)–Shanghai is emerging and creating a pattern of capital and knowledge circulation in the nodes of transnational business networks. The power of the transnational technical community is evident, and has become a key force in shaping the global production networks. It originated in Silicon Valley and has been transferred first to Taiwan by overseas Chinese entrepreneurs (emigrated from Taiwan) and then from Taiwan (as well as directly from Silicon Valley) to China. The dense social and professional networks foster flows of technology, capital, know-how, and information within the triangle, supporting entrepreneurship in the three regions while also providing the foundation for formal inter-regional business relations such as consortia, joint-ventures, and partnerships.

The spatial outreach of major Taiwanese ICT firms has been occurring since the late 1980s, although it has been accelerating very rapidly in China (see Chen, 2002; Yang and Hsia,

2006). In developing this triangular connection, the Taipei-Hsinchu region continues to maintain its competitive edge in serving global lead firms such as Hewlett-Packard and Motorola through innovative designs, product developments, and sophisticated supply chain management grounded in the Taipei-Hsinchu region. And yet these Taiwanese firms are able to achieve cost competitiveness through their manufacturing operations in the two delta regions in China (and elsewhere in Southeast Asia). In many ways, this transnational triangle resembles Dunford's (2006: 29) idea of a "magic circle" in the Italian clothing industry centred around Milan where clothing "districts are parts of an interdependent, interregional, and international division of labor in the sector and are profoundly shaped by their articulation with the distribution system".

In Singapore, such transnational community of elite professionals and entrepreneurs also exists. In one example, Venture Corp's Chairman and CEO Wong Ngit Liong was formerly recruited by HP in California and sent back to Southeast Asia to establish HP factories in Malaysia and Singapore during the 1970s. After 12 years with HP, he struck out on his own and subsequently built Venture Corp into a top 10 world-class EMS provider, with a turnover of US\$2 billion in 2005. Venture is now the strategic partner of both HP and its spin-off Agilent Technology (Interviewed in Singapore, 19 May 2006). Venture Corp, however, is an exception rather than a rule in explaining Singapore's articulation into the electronics GPN. In contrast to the Taipei-Hsinchu region, Singapore prides itself in attracting global lead firms in the electronics industry to establish *direct presence* in terms of R&D facilities and manufacturing operations. As the largest manufacturing industry in Singapore accounting for 9.8% of GDP and 36.5% of manufacturing output in 2005, the electronics industry boosts the substantial presence of the industry who's who in the global league of lead firms, e.g. HP, Matsushita, Motorola, Philips, Samsung, Seagate, ST Microelectronics, Toshiba, and so on. Apart from generous fiscal and non-fiscal incentives offered by the Singapore

government, these world-class electronics firms also benefit from Singapore's important logistical position in the electronics GPN. Singapore's Changi Airport is the world's eighth busiest freight handling airport and Singapore Airlines is the world's fourth largest freight carriers in terms of freight tonne-kilometres (Bowen and Leinbach, 2006: 155). Virtually all leading third party logistics (3PL) providers have established a strong presence in Singapore, e.g. Exel (the UK), DHL (the Netherlands), and GeoLogistics (the US). Taken together, the experience of both the Taipei-Hsinchu region and Singapore shows that regional development can benefit substantially from the strategic coupling of local firms with global lead firms. More generally, a form of international partnership exists between these regions and lead firms in GPNs, facilitating by an indigenous community of transnational elites and entrepreneurial firms.

Strategic coupling through indigenous innovation and production platforms

Similar to the success stories in Western Europe, endogenous regional development can occur if there are sufficient efforts in developing innovative capacity in specific regions. The Seoul Metropolitan Area is a good illustration here (see Table 1), as it plays host to two of the world's largest producers of digital TV and mobile phones – Samsung Electronics and LG Electronics. Unlike their Taiwanese and Singaporean counterparts, these South Korean *chaebols* have chosen a different developmental trajectory that is described by Lee et al. (2005b) as path-creating catch-up; they have grown from serving as subcontractors to OEMs to become OBMs in their own right (see van Hoesel, 1999; Cyhn, 2002). While state promotion efforts have laid important preconditions for these two *chaebols*, their strategic coupling through technology licensing and agreements with respective lead firms provides the initial knowledge base for their subsequent choice of leapfrogging as a successful pathway to global leadership. This process of strategic coupling was particularly critical during the early

phase of their entry in both product categories. Samsung, for example, achieved rapid catch-up through such technology agreements in the semiconductor industry between 1983 and 1997 (see Lim, 1999: Table 4.9). Cyhn (2002: Chapter 3) observes that by the early 1990s, the *chaebols* had become much less dependent on government-sponsored research institutes for their technological innovation. Instead, they turned to in-house R&D labs, friendly global lead firms, and international industrial associations. To Lee et al. (2005b: 42), both Samsung and LG have successfully pursued a path-creating catch-up approach through an appropriate combination of “technological regimes, the competitive advantages of the innovation outcomes in the market, the foreign and domestic knowledge base, the government policies and firm strategies”. By the mid-2000s, they had become first movers in these two product categories.

Our research shows that both *chaebols* have actively pursued a strategy of OBM with their own distinctive technological strength and marketing capability. There is also a great deal of reluctance in internationalizing their R&D and manufacturing activity. Both companies prefer to keep a large portion of their manufacturing activity in South Korea, particularly within the Seoul Metropolitan Area (Interviews with Samsung Electronics and LG Electronics in Seoul, May 2004 and June 2005). With respective sales of US\$80 billion and US\$44 billion in 2005, Samsung Electronics and LG Electronics have become world’s top three PDP and LCD makers. Samsung Electronics is also the world’s No.2 mobile handset manufacturer, trailing just behind Finland’s Nokia, and the world’s largest maker of memory chips and LCD driver integrated circuits. Taking into account Samsung’s first foray into the memory chip business in September 1982 (Lim, 1999; Shin and Jang, 2005), its global market dominance since its successful construction of the world’s first 1-Gigabyte DRAM prototype in November 1996 is indeed a remarkable achievement.

This South Korean strategy of building highly vertically integrated OBMs such as

Samsung, LG, and Hyundai, however, requires very substantial financial commitments and technological development – something that regions in other Asian developing countries cannot yet afford. Instead, these regions such as China’s two delta regions, Malaysia’s Penang, and Thailand’s Greater Bangkok region are strategically coupled with the demand for competitive *production platforms* by lead firms in GPNs (see Table 1). As production platforms, these regions provide very competitive cost structures, abundant labour supply, stable policy environment, and so on. Their institutional set-up is geared not so much towards developing indigenous capability as in the case of industrial districts in the US, Western Europe and, more recently, South Korea. Rather, these developing country regions are actively plugging themselves into evolving global divisions of labour spearheaded by brand name lead firms (OEMs). This process of strategic coupling is sometimes mediated by the strategic partners of global lead firms in the Asian NIEs (EMS and ODMs). The resultant regional development trajectory is thus not a straightforward pattern of the “new international division of labour” described in Fröbel et al. (1980) and, more recently, in Scott (2006). It reflects much more complicated pattern of strategic coupling that occurs during the past 15 years when manufacturing firms in the Asian NIEs have emerged as strategic partners of global lead firms. In this context, the strategic coupling of these developing regions as production platforms is coordinated through Asian partners of global lead firms. This is particularly the case in China’s Yangtze River Delta and Pearl River Delta (see Table 1). Export-oriented production platforms have been well established to serve global lead firms and their Asian strategic partners – mostly from Hong Kong, Singapore, and Taiwan – in such diverse industries as clothing, footwear, consumer products, electronics, and ICT.

In the electronics GPNs, Malaysia’s Penang has gained a strong foothold in the development of integrated manufacturing of computer and semiconductor products (see Table 1). In 2000, electronics accounted for over 80% of Malaysia’s total manufactured exports

(Rasiah, 2006: 127; see also Ernst, 2004). After over three decades of active promotion of the industry at the federal and state level, Penang is now well articulated into the electronics GPNs, primarily through such lead firms as Intel, Dell, and Seagate (including the former Maxtor and Conner Peripherals), and their different tiers of foreign and domestic suppliers (e.g. Read-Rite, Komag, MMI, and Eng Teknologi). Together with Singapore and Thailand, Penang is an integral part of the Southeast Asian “golden triangle” that accounts for a massive majority of the global hard disk drive (HDD) production. It now serves as a “ramp-up” centre for these global lead firms to prepare new products for mass production in other lower cost locations in Southeast Asia or China (Bowen and Leinbach, 2006: 155). The Penang Development Corporation (PDC) plays a critical role in this coupling process by developing and maintaining the air hub at Penang with strong links to Singapore, Taipei, and Tokyo, and introducing IT into the supply chains of local firms.

In Thailand’s Greater Bangkok region that includes Rayong and Samutprakarn provinces along the eastern seaboard (see Figure 2 and Table 1), global lead firms in two contrasting GPNs have found favourable production platforms for their regional and global markets: automobile and HDD industries (see Krongkaew and Krongkaew, 2006). In both industries, the Thai regions have successfully coupled with the demand by global lead firms for low cost and reliable production platforms. In the automobile industry, the Rayong region has now become Southeast Asia’s leading production centre, featuring some two dozen automobile assemblers (global lead firms) and their 700 plus first-tier suppliers (Coe et al., 2004: 479; see also Doner et al., 2004; Takayasu and Mori, 2004; Hassler, 2006). In 2003, the automobile industry exported 230,000 units of its total production of 760,000 cars. It is now the second largest export after electronics and electrical products.

In the HDD industry, we can find major manufacturing facilities in the same Thai regions, operated by the world’s leading HDD firms such as Seagate, Maxtor (part of Seagate

after the acquisition in May 2006), Western Digital, Hitachi-IBM, and Fujitsu. Thailand is only second to Singapore in terms of global HDD outputs. In the HDD industry, McKendrick et al. (2000: 8) note that “[t]he ongoing fit between the operational requirements of American HDD firms and the region’s abilities underscores the dynamic character of competitive advantage”. The Thai regions are also intimately woven into the complex regional production networks of these global lead firms and their major suppliers based in Singapore (McKendrick et al., 2000; Wong, 2001). For example, MMI Holdings, a world’s leading precision component supplier and a strategic partner of Seagate, enjoys proximity to Seagate’s operational headquarter in Singapore and a long-standing partnership since its inception as an OEM supplier to Seagate in 1989. As a Singaporean company, MMI has developed very strong capability and competitiveness in manufacturing die cast base plates for Seagate disk drives (Interview with co-founder and Group Managing Director in Singapore, 22 June 2006).

4. Conclusion

In this paper, I have attempted to situate regional development trajectories within the competitive dynamics of global production networks. Moving away from the new regionalism approach in which analytical privilege is placed on networks and institutions endogenous to specific regions, my interest here rests with how these regions are articulated into the global economy. This question can only be satisfactorily answered if we examine the critical link between regions and the global economy – business firms and their trans-scalar production networks. In doing so, I focus on the strategic coupling of key actors in regions – local firms – and their lead firm counterparts in respective GPNs. This relational approach to linking regional performance with GPN dynamics is fruitful because it helps us avoid the danger of a myopic reading of regional development inherent in the new regionalism literature. More importantly, it helps us appreciate the relevance of what Amin and Thrift (1994b) some time

ago called “holding down the global”. Without unpacking the strategic coupling processes and mechanisms, we will not be able to explain convincingly why global lead firms have selectively incorporated some regions into their GPNs. My analytical approach therefore echoes several recent attempts to understand the phenomenon of “globalizing” regional development in economic geography and regional studies (Coe et al., 2004; see also Amin, 1998; MacKinnon et al., 2002; Smith et al., 2002; Cox, 2004; Hudson, 2004).

To “operationalize” my arguments, I have illustrated two contrasting development trajectories among several major growth regions in East Asia. Based on an analysis of firms and industries in these growth regions, I have provided some evidence for the analytical relevance of understanding the strategic coupling between regions and GPNs (see also Yusuf et al., 2004; Gereffi et al., 2005). In the cases of the Taipei-Hsinchu region and Singapore, a distinct trajectory of strategic partnership with global lead firms is identified. In both instances, there exist deeply coupled relationships between the region and propulsive GPNs. Whereas local firms in the Taipei-Hsinchu region play a much more instrumental role in coupling transnationally with vertically specialized global lead firms, the developmental trajectory in Singapore is more driven by the direct presence of these global lead firms and their local coupling process. In other growth regions of East Asia, the coupling process works out differently. In South Korea, for example, the Seoul Metropolitan Area is articulated into the global economy through indigenous innovation activity by large-scale *chaebols*. Global lead firms play a much less significant role here. In China, Malaysia, and Thailand, global lead firms have established major operations, mediated by their Asian strategic partners, to take advantage of the production platforms of these regions. All of these cases point to the analytical importance of understanding regional development as a form of trans-local dynamics constituted by the complex strategic coupling process between local firms and lead firms in global production networks. They also show how the archetypical Asian

developmental state can play a necessary but not sufficient role in engendering regional development. Effective state policies and initiatives can enhance the strategic coupling process. But this enhancement takes place within the broader context of global lead firms searching active for the spatial, organizational, and technological fixes of their competitive problems. Overall then, regional development is a multi-scalar phenomenon that encapsulates the local firm, the region, the nation-state, transnational lead firms, and global production networks.

Looking forward, this analysis provides several major implications for theory and policy. First, it is clear that we need to theorize the (re)positioning of regions within GPNs. This is an important task as the coupling mechanisms and articulation processes are not yet fully theorized and understood. This theoretical inadequacy is particularly unfortunate because the interest in the trans-local dynamics of regional development was raised as early as the 1970s in Dicken (1976) and Massey (1979). While the recent “relational turn” in regional studies and the GPN-inspired research programme have begun to focus on the issue of regional development, there is a great deal of theoretical work required for understanding how regions are articulated into GPNs over time. Our theoretical work also needs to go beyond industrial organization, technological change, and knowledge accumulation. There is also a high important but often neglected aspect of the financialization of regions in GPNs. Pike (2006), for example, shows recently how firm closure in a region can be intricately linked to strategic considerations by financial communities located elsewhere, often in global financial centres. We need to theorize urgently how technology, knowledge, and finance shape the strategic coupling of regions in GPNs.

Second, the multi-scalar analysis of regional development from a GPN perspective points to the importance of theorizing the intensification of inter-regional competition. As different regions are articulated into the global economy through diverse networks of local

firms and their global lead firm partners, we expect inter-regional competition to be significantly intensified. In the East Asian context, regions are competing directly with each other through their efforts in developing indigenous firms, facilitating their coupling with global lead firms, and attracting the direct presence of these lead firms in GPNs. As the Taipei-Hsinchu region, the Yangtze River Delta, Penang, Rayong, and Singapore are competing fiercely in the global ICT industry, there is a misleading perception that these different regions are in head-on collision with each other within the context of a zero-sum game. Indeed, the reality is far more complex and interdependent than the above casual observation commonly found in the public domain. There are, for example, intricate and, often, complementary relationships between global lead firms, their strategic partners in Taiwan and Singapore, and production sites in the Yangtze River Delta, Penang, and Rayong. This “inter-regional” competition should rather be theorized as intra- and inter-GPN competition. At the intra-GPN level, different EMS and ODM providers are competing against each other for the same lead firm. At the inter-GPN level, lead firms and strategic partners belonging to different GPNs are competing for market shares.

This phenomenon is not unique to the global ICT Industry and can be observed easily in other industries and regions (see also Phelps and Fuller, 2000). Reflecting on the future of textile and clothing firms in Italy, for example, Dunford (2006: 56) notes that “many are insufficiently differentiated from producers in low-cost countries and are insufficiently oriented toward export markets with growth potential. As a result, many enterprises and regional economies are under threat”. His conclusion underscores the critical importance of understanding the strategic coupling of firm activities in regional economies within GPNs. For this coupling process brings about greater intra- and inter-GPN competition that may manifest in the form of alleged inter-regional competition. Clearly, we need to theorize these complex relationships that impinge on inter-regional competition.

Last but not least, we can learn a great deal about strategic policy options from a GPN perspective. Regional authorities and government agencies should not be paying excessive policy attention to building regional capability *without* carefully assessing and understanding the kind of GPNs with which the region can have a good chance of strategic coupling. This means an in-depth assessment of the position of a region within certain GPNs. There is, of course, no easy policy solution and universal panacea, as pointed out in the second implication above. Regions can become locked-into the strategic interests of global lead firms and face a serious policy dilemma when the latter disembed from these regions (Phelps et al., 1998; Phelps and Waley, 2004; see also Martin and Sunley, 2006). While regions are not necessarily the scale at which competition takes place, regions do certainly experience the *outcomes* of this competition. This is where policy instruments might be deployed to mitigate the potential negative regional impact of intra- and inter-GPN competition. Again, such policy initiatives should be situated within a comprehensive understanding of the relationships and positions of a region in certain highly competitive GPNs. This greater sensitivity and sensibility in regional policy making, in Stiglitz's (2001: 523) words, requires decisions makers "to resist accepting without question the current mantras of the global marketplace of ideas". The currently endless debate on clusters in regional studies is just one such example (see Martin and Sunley, 2003).

It does not make much sense, for example, to implement policies that promote a region as a production platform for lead firms in GPNs, if the region already has strong presence of local firms and technological competence. Regional policies will likely to be more effective if they are designed to help these local firms to achieve enduring strategic coupling with lead firms in GPNs (e.g. the Taipei-Hsinchu region) or to become global lead firms in their own right (e.g. the Seoul Metropolitan Area). In other developing regions (e.g. the Yangtze River Delta and Penang), the policy challenge is much more complicated as local

firms remain relatively weak in their organizational and technological capabilities. And yet these regions face tremendous pressure from cost-based competition. Whatever the chosen development trajectory and policy regime, one important lesson is that they are unlikely to be effective and sustainable without a full appreciation of the trans-local dynamics in which the region is located. This is the key contribution of thinking of regional development as necessarily situated in the competitive dynamics of global production networks.

Notes

¹ My observation may appear to be quite strange when key developmental state theorists had published their work by the late 1980s and early 1990s (e.g. Amsden, 1989; Wade, 1990). While not denying the significance of state policies in paving the initial conditions for industrialization and economic development (see also Lee et al., 2005a), I believe their work was based on research conducted in and referring to mostly the early phases of development during the 1970s and the 1980s.

² The empirical evidence presented here originates from a major transnational research project in which personal interviews with top executives of leading Asian firms were conducted in the four NIEs. We interviewed a total of 68 leading Asian firms between June 2004 and June 2006: 19 Hong Kong firms, 13 South Korean firms, 24 Taiwanese firms, and 12 Singaporean firms. These firms were selected on the basis of their 2003/2004 operating revenues or turnover captured in the OSIRIS database published by Bureau van Dijk Electronic Publishing, a comprehensive database containing detail financial information on publicly listed companies worldwide. We selected the top 50 firms from each of the four NIEs and approached them for personal interviews with their top executives. Among the 68 leading Asian firms interviewed, 15 were in the top-10 and 29 were in the top-20 by operating revenues in their respective economies. Eleven of them were ranked in UNCTAD's (2005) Top 50 TNCs from developing economies. Some 33 of the interviewees were CEOs/Presidents or Managing Directors, whereas another 32 were Executive Directors, General Managers, or (Senior/Executive) Vice Presidents. In some cases (e.g. Samsung Electronics), personal interviews with several top executives were conducted. In all interviews lasting between one to two hours, we took an open-ended approach and used only brief interview aides. Extensively background information from all available public sources was consulted to form the basis of customized qualitative questions during each interview. All except one interview were taped and transcribed and these transcripts and other relevant information form the empirical basis of this paper.

³ Again, it is important to note that this concept, despite its potential misinterpretation as a structuralist or functionalist take, is a heuristic device for understanding the interconnections with regions and global production networks (see Coe et al., 2004: endnote 1).

⁴ There is now a credible body of literature examining the political economy of regional development in China (Fan, 1995; Lin, 1997; Marton, 2000; Wei, 2000; Zweig, 2002), Malaysia (Jomo and Greg, 1999; Morshidi, 2000; Smakman, 2003), South Korea (Cho, 1997; Park, 2005), Taiwan (Hsu and Cheng, 2002; Hsu, 2005), and Thailand (Unger, 1998; Dixon, 1999; Glassman, 2001).

⁵ Singapore is taken as a region in this section, even though it is an independent nation-state. As a city-state, Singapore is territorially and functionally not too different from any major global city-regions in the world (Scott, 2001; Olds and Yeung, 2004).

References

- Amin, Ash (1998), 'Globalisation and regional development: a relational perspective', *Competition and Change*, Vol.3, pp.145-65.
- Amin, Ash (2004), 'Regions abound: towards a new politics of place'. *Geografiska Annaler B*, Vol.86(1), pp.33-44.
- Amin, Ash and Thrift, Nigel (1994a), 'Living in the global', in Ash Amin and Nigel Thrift (eds.), *Globalization, Institutions, and Regional Development in Europe*, Oxford: Oxford University Press, pp.1-22.
- Amin, Ash and Thrift, Nigel (1994b), 'Holding down the global', in Ash Amin and Nigel Thrift (eds.), *Globalization, Institutions, and Regional Development in Europe*, Oxford: Oxford University Press, pp.257-60.
- Amsden, Alice H. (1989), *Asia's Next Giant: South Korea and Late Industrialization*, New York: Oxford University Press.
- Amsden, Alice H. (2001), *The Rise of "The Rest": Challenges to the West From Late-Industrializing Economies*, New York: Oxford University Press.
- Asheim, Bjørn T. (1996), 'Industrial districts as "learning regions"', *European Planning Studies*, Vol.4(4), pp.379-400.
- Bathelt, Harald (2006), 'Geographies of production: growth regimes in spatial perspective 3 – towards a relational view of economic action and policy', *Progress in Human Geography*, Vol.30(2), pp.223-36.
- Bathelt, Harald and Glückler, Johannes (2003), 'Toward a relational economic geography', *Journal of Economic Geography*, Vol.3(2), pp.117-44.
- Bialasiewicz, Luiza (2006), 'Geographies of production and the contexts of politics: dislocation and new ecologies of fear in the Veneto *citta diffusa*', *Environment and Planning D: Society and Space*, Vol.24(1), pp.41-67.
- Boekema, Frans, Morgan, Kevin, Bakkers, Silvia and Rutten, Roel (eds.) (2000), *Knowledge, Innovation and Economic Growth: The Theory and Practice of Learning Regions*, Cheltenham: Edward Elgar.
- Boggs, Jeffrey S. and Rantisi, Norma M. (2003), 'The "relational turn" in economic geography', *Journal of Economic Geography*, Vol.3(2), pp.109-16.
- Bowen, John T. Jr. and Leinbach, Thomas R. (2006), 'Competitive advantage in global production networks: air freight services and the electronics industry in Southeast Asia', *Economic Geography*, Vol.82(2), pp.147-66.
- Boyd, Richard and Ngo, Tak-Wing (eds.) (2005), *Asian States: Beyond the Developmental Perspective*, London: RoutledgeCurzon.

- Braczyk, Hans-Joachim, Cooke, Philip and Heidenreich, Martin (eds.) (1997), *Regional Innovation Systems: The Role of Governances in a Globalized World*, London: UCL Press.
- Brenner, Neil, Jessop, Bob, Jones, Martin and MacLeod, Gordon (eds.) (2003), *State/Space*, Oxford: Blackwell.
- Bunnell, Timothy G. and Coe, Neil M. (2001), 'Spaces and scales of innovation', *Progress in Human Geography*, Vol.25(4), pp.569-90.
- Chen, Shin-Horng (2002), 'Global production networks and information technology: the case of Taiwan', *Industry and Innovation*, Vol.9(3), pp.249-65.
- China Statistics Press (2005), *China Statistical Yearbook*, Beijing: China Statistics Press.
- Cho, Myung-Rae (1997), 'Flexibilization through metropolis: the case of postfordist Seoul, Korea', *International Journal of Urban and Regional Research*, Vol.21(2), pp.180-201.
- Chu, Yun-Peng (2006), 'The political economy of Taiwan's high-tech industrialisation', in Yun-Peng Chu and Hal Hill (eds.), *The East Asian High-Tech Drive*, Cheltenham: Edward Elgar, pp.119-81.
- Coe, Neil, Hess, Martin, Yeung, Henry Wai-chung, Dicken, Peter and Henderson, Jeffrey (2004), "'Globalizing" regional development: a global production networks perspective', *Transactions of the Institute of British Geographers*, New Series, Vol.29(4), pp.468-84.
- Coe, Neil M., Kelly, Philip F. and Olds, Kris (2003), 'Globalization, transnationalism, and the Asia-Pacific', in Jamie Peck and Henry Wai-chung Yeung (eds.), *Remaking the Global Economy: Economic-Geographical Perspectives*, London: Sage, pp.45-60.
- Cooke, Philip N. and Morgan, Kevin (1998), *The Associational Economy: Firms, Regions, and Innovation*, Oxford: Oxford University Press.
- Cox, Kevin R. (2004), 'Globalization and the politics of local and regional development: the question of convergence', *Transactions of the Institute of British Geographers*, Vol.29(2), pp.179-94.
- Cyhn, Jin W. (2002), *Technology Transfer and International Production: The Development of the Electronics Industry in Korea*, Cheltenham: Edward Elgar.
- Department of Statistics, Malaysia (2003/2006), *State/District Data Bank*, CD-ROM version, Kuala Lumpur: DOS.
- Dicken, Peter (1976), 'The multiplant business enterprise and geographical space: some issues in the study of external control and regional development', *Regional Studies*, Vol.10, pp.401-12.
- Dicken, Peter (2007), *Global Shift: Mapping the Changing Contours of the World Economy*, Fifth Edition, London: Sage.

- Dicken, Peter, Kelly, Philip, Olds, Kris and Yeung, Henry Wai-chung (2001), 'Chains and networks, territories and scales: towards an analytical framework for the global economy', *Global Networks*, Vol.1(2), pp.89-112.
- Dicken, Peter and Malmberg, Anders (2001), 'Firms in territories: a relational perspective', *Economic Geography*, Vol.77(4), pp.345-63.
- Dixon, Chris (1999), *The Thai Economy: Uneven Development and Internationalisation*, London: Routledge.
- Doner, Richard F., Noble, Gregory W. and Ravenhill, John (2004), 'Production networks in East Asia's automobile parts industry', in Shahid Yusuf, M. Anjum Altaf and Kaoru Nabeshima (eds.) *Global Production Networking and Technological Change in East Asia*, World Bank, DC: Oxford University Press, pp.159-208.
- Doner, Richard F., Ritchie, Bryan K. and Slater, Dan (2005), 'Systemic vulnerability and the origins of developmental states: Northeast and southeast Asia in comparative perspective', *International Organization*, Vol.59(2), pp.327-61.
- Dunford, Michael (2003), 'Theorizing regional economic performance and the changing territorial division of labour', *Regional Studies*, Vol.37(8), pp.839-54.
- Dunford, Michael (2006), 'Industrial districts, magic circles, and the restructuring of the Italian textiles and clothing chain', *Economic Geography*, Vol.82(1), pp.27-59.
- Ernst, Dieter (2004), 'Global production networks in East Asia's electronics industry and upgrading prospects in Malaysia', in Shahid Yusuf, M. Anjum Altaf and Kaoru Nabeshima (eds.) *Global Production Networking and Technological Change in East Asia*, World Bank, DC: Oxford University Press, pp.89-157.
- Ernst, Dieter (2005), 'Pathways to innovation in Asia's leading electronics-exporting countries - a framework for exploring drivers and policy implications', *International Journal of Technology Management*, Vol.29(1-2), pp.6-20.
- Executive Yuan, ROC (2003), *The Report on 2001 Industry, Commerce and Service Census Taiwan-Fuchien Area, The Republic of China, Vol.1 General Report*, Taipei: Executive Yuan.
- Executive Yuan, ROC (2005), *Statistical Yearbook of the Republic of China 2004*, Taipei: Executive Yuan.
- Fan, Cindy C. (1995), 'Of belts and ladders: state policy and uneven regional development in Post-Mao China', *Annals of the Association of American Geographers*, Vol.85(3), pp.421-49.
- Feenstra, Robert C. and Hamilton, Gary G. (2006), *Emergent Economies, Divergent Paths: Economic Organization and International Trade in South Korea and Taiwan*, Cambridge: Cambridge University Press.

- Fornahl, Dirk and Brenner, Thomas (eds.) (2003), *Cooperation, Networks and Institutions in Regional Innovation Systems*, Cheltenham: Edward Elgar.
- Fröbel, Folker, Heinrichs, Jurgen, and Kreye, Otto (1980), *The New International Division of Labour*, Cambridge: Cambridge University Press.
- Gereffi, Gary (2005), 'The global economy: organization, governance, and development', in Neil J. Smelser and Richard Swedberg (eds.), *The Handbook of Economic Sociology*, 2nd ed. Princeton, NJ: Princeton University Press, pp.160-82.
- Gereffi, Gary, Humphrey, John and Sturgeon, Timothy (2005), 'The governance of global value chains', *Review of International Political Economy*, Vol.12(1), pp.78-104.
- Glassman, Jim (2001), 'Economic crisis in Asia: the case of Thailand', *Economic Geography*, Vol.77(2), pp.122-47.
- Goodwin, Mark and Painter, Joe (1996), 'Local governance, the crises of Fordism and the changing geographies of regulation', *Transactions of the Institute of British Geographers*, Vol.21(4), pp.635-48.
- Hadjimichalis, Costis (2006), 'The end of Third Italy as we knew it?', *Antipode*, Vol.38(1), pp.82-106.
- Harrison, Bennett (1997), *Lean and Mean: The Changing Landscape of Corporate Power in the Age of Flexibility*, New York: Guilford.
- Harvey, David (1982), *The Limits to Capital*, Oxford: Basil Blackwell.
- Harvey, David (1989), *The Condition of Postmodernity: An Enquiry into the Origins of Cultural Change*, Oxford: Basil Blackwell.
- Hassler, Markus (2006), *Global Production Networks and Industrial Transformation: The Automobile Industry of Thailand*, Unpublished Habilitation Thesis, Department of Geography, Ruhr-University Bochum, Germany.
- Heaver, Trevor D. (2004), 'Logistics in East Asia', in Shahid Yusuf, M. Anjum Altaf and Kaoru Nabeshima (eds.) *Global Production Networking and Technological Change in East Asia*, World Bank, DC: Oxford University Press, pp.297-351.
- Henderson, Jeffrey (1989), *The Globalisation of High Technology Production*, London: Routledge.
- Henderson, Jeffrey, Dicken, Peter, Hess, Martin, Coe, Neil and Yeung, Henry Wai-chung (2002), 'Global production networks and the analysis of economic development', *Review of International Political Economy*, Vol.9(3), pp.436-64.
- Hess, Martin and Yeung, Henry Wai-chung (2006), 'Whither global production networks in economic geography? Past, present and future', *Environment and Planning A*, Vol.38(7), pp.1193-1204.

- Hobday, Michael (2001), 'The electronics industries of the Asia-Pacific: exploiting international production networks for economic development', *Asian-Pacific Economic Literature*, Vol.15(1), pp.13–29.
- Hsu, Jinn-Yuh (2005), 'A site of transnationalism in the "Ungrounded Empire": Taipei as an interface city in the cross-border business networks', *Geoforum*, Vol.36, pp.654-66.
- Hsu, Jinn-Yuh and Cheng, Lu-Lin (2002), 'Revisiting economic development in post-war Taiwan: the dynamic process of geographical industrialization', *Regional Studies*, Vol.36(8), pp.897-908.
- Hsu, Jinn-Yuh, Poon, Jessie P. and Yeung, Henry Wai-chung (2007), 'External leveraging and technological upgrading among East Asian firms in the United States', *European Planning Studies*, Vol.15(6).
- Hsu, Jinn-Yuh and Saxenian, AnnaLee (2000), 'The limits of guanxi capitalism: transnational collaboration between Taiwan and the USA', *Environment and Planning A*, Vol.32(11), pp.1991-2005.
- Hudson, Ray (1999), 'The learning economy, the learning firm and the learning region: a sympathetic critique of the limits to learning', *European Urban and Regional Studies*, Vol.6(1), pp.59-72.
- Hudson, Ray (2004), 'Conceptualising economies and their geographies: spaces, flows and circuits', *Progress in Human Geography*, Vol.28(4), pp.447-71.
- Hudson, Ray (2005), 'Region and place: devolved regional government and regional economic success?', *Progress in Human Geography*, Vol.29(5), pp.618-25.
- Hudson, Ray (2006), 'Regional devolution and regional economic success: enabling myths and illusions about power', *Geografiska Annaler B*, Vol.88(2), Vol.159-71.
- Jomo, Kwame Sundaram and Felker, Greg (ed.) (1999), *Technology, Competitiveness and the State: Malaysia's Industrial Technology Policies*, London: Routledge.
- Jonas, Andrew E.G. and Pincetl, Stephanie (2006), 'Rescaling regions in the state: the new regionalism in California', *Political Geography*, Vol.25, pp.482-505.
- Jones, Martin R., Goodwin, Mark and Jones, Rhys (eds.) (2005), 'Special issue on devolution and economic governance', *Regional Studies*, Vol.39(4), pp.397-553.
- Krongkaew, Medhi and Krongkaew, Teeraya (2006), 'Thailand as a high-tech industrial economy: an impossible dream?', in Yun-Peng Chu and Hal Hill (eds.), *The East Asian High-Tech Drive*, Cheltenham: Edward Elgar, pp.259-300.
- Lagendijk, Arnoud (2006), 'Learning from conceptual flow in regional studies: Framing present debates, unbracketing past debates', *Regional Studies*, Vol.40(4), pp.385-99.
- Lee, Kuen and Lim, Chaisung (2001), 'Technological regimes, catching-up and leapfrogging: findings from the Korean industries', *Research Policy*, Vol. 30, pp.459–483.

- Lee, Kuen, Lin, Justin Y. and Chang, Ha-Joon (2005a), 'Late marketisation versus late industrialisation in East Asia', *Asian-Pacific Economic Literature*, Vol.19, pp.42-59.
- Lee, Kuen, Lim, Chaisung and Song, Wichin (2005b), 'Emerging digital technology as a window of opportunity and technological leapfrogging: catch-up in digital TV by the Korean firms', *International Journal of Technology Management*, Vol.29(1/2), pp.40-63.
- Leinbach, Thomas R., and Bowen, John T. (2004), 'Air cargo services and the electronics industry in Southeast Asia', *Journal of Economic Geography*, Vol.4(2), pp.1-24.
- Leng, Tse-kang (2002), 'Economic globalization and IT talent flows across the Taiwan Strait: the Taipei/Shanghai/Silicon Valley triangle', *Asian Survey*, Vol.42(2), pp.230-50.
- Lim, Youngil (1999), *Technology and Productivity: The Korean Way of Learning and Catching Up*, Cambridge, MA: MIT Press.
- Lin, George C.S. (1997), *Red Capitalism in South China: Growth and Development of the Pearl River Delta*, Vancouver: University of British Columbia Press.
- Liu, Tzu-Hsin, Chu, Yee-Yeen, Hung, Shih-Chang and Wu, Shien-Yang (2005), 'Technology entrepreneurial styles: a comparison of UMC and TSMC', *International Journal of Technology Management*, Vol.29(1/2), pp.92-115.
- Lovering, John (1999), 'Theory led by policy: The inadequacies of the 'new regionalism' (illustrated from the case of Wales)', *International Journal of Urban and Regional Research*, Vol.23(2), pp.379-95.
- Lundvall, Bengt-Ake, Intarakumnerd, Patarapong and Vang-Lauridsen, Jan (eds.) (2006), *Asia's Innovation Systems in Transition*, Cheltenham: Edward Elgar.
- Lüthje, Boy (2002), 'Electronics contract manufacturing: global production and the international division of labor in the age of the internet', *Industry and Innovation*, Vol.9(3), pp.227-47.
- McKendrick, David G., Doner, Richard F. and Haggard, Stephan (2000) *From Silicon Valley to Singapore: Location and Competitive Advantage in the Hard Disk Drive Industry*, Stanford: Stanford University Press.
- Macher, Jeffrey T., Mowery, David C. and Simcoe, Timothy S. (2002), 'E-business and disintegration of the semiconductor industry value chain', *Industry and Innovation*, Vol.9(3), pp.155-81.
- MacKinnon, Danny, Cumbers, Andrew and Chapman, Keith (2002), 'Learning, innovation and regional development: a critical appraisal of recent debates', *Progress in Human Geography*, Vol.26(3), pp.293-311.

- MacLeod, Gordon (2001), 'New regionalism reconsidered: globalization and the remaking of political economic space', *International Journal of Urban and Regional Research*, Vol.25(4), pp.804-29.
- Mansfield, Becky (2005), 'Beyond rescaling: reintegrating the 'national' as a dimension of scalar relations', *Progress in Human Geography*, Vol.29(4), pp.458-73.
- Markusen, Ann (1994), 'Studying regions by studying firms', *The Professional Geographer*, Vol.46(4), pp.477-90.
- Markusen, Ann (2004), 'An actor-centered approach to economic geographic change', *Annals of the Japan Association of Economic Geographers*, Vol.49(5), pp.395-408.
- Martin, Ron and Sunley, Peter (2003), 'Deconstructing clusters: chaotic concept or policy panacea?', *Journal of Economic Geography*, Vol.3(1), pp.5-35.
- Martin, Ron and Sunley, Peter (2006), 'Path dependence and regional economic evolution', *Journal of Economic Geography*, Vol.6, pp.395-437.
- Marton, Andrew M. (2000), *China's Spatial Economic Development: Regional Transformation in the Lower Yangzi Delta*, London: Routledge.
- Massey, Doreen (1979), 'In what sense a regional problem?', *Regional Studies*, Vol.13, pp.233-43.
- Massey, Doreen (1984), *Spatial Divisions of Labour: Social Structures and the Geography of Production*, London: Macmillan.
- Mathews, John A. (1997), 'A Silicon Valley of the east: creating Taiwan's semiconductor industry', *California Management Review*, Vol.39(4), pp.26-54.
- Mathews, John A. (2005), 'Strategy and the crystal cycle', *California Management Review*, Vol.47(2), pp.6-32.
- Mathews, John A. (2006a), *Strategizing, Disequilibrium and Profit*, Stanford, CA: Stanford University Press.
- Mathews, John A. (2006b), 'Electronics in Taiwan – a case of technological learning', in Vandana Chandra (ed.), *Technology, Adaptation, and Exports: How Some Developing Countries Got It Right*, Washington, DC: World Bank, pp.83-126.
- Mathews, John A. (2007), 'How Taiwan built an electronics industry: lessons for developing countries today', in Henry Wai-chung Yeung (ed.), *Handbook of Research on Asian Business*, Cheltenham: Edward Elgar, pp.307-32.
- Morgan, Kevin (1997), 'The learning region: Institutions, innovation and regional renewal', *Regional Studies*, Vol.31(5), pp.491-503.
- Morgan, Kevin (2004), 'The exaggerated death of geography: learning, proximity and territorial innovation systems', *Journal of Economic Geography*, Vol.4(1), pp.3-21.

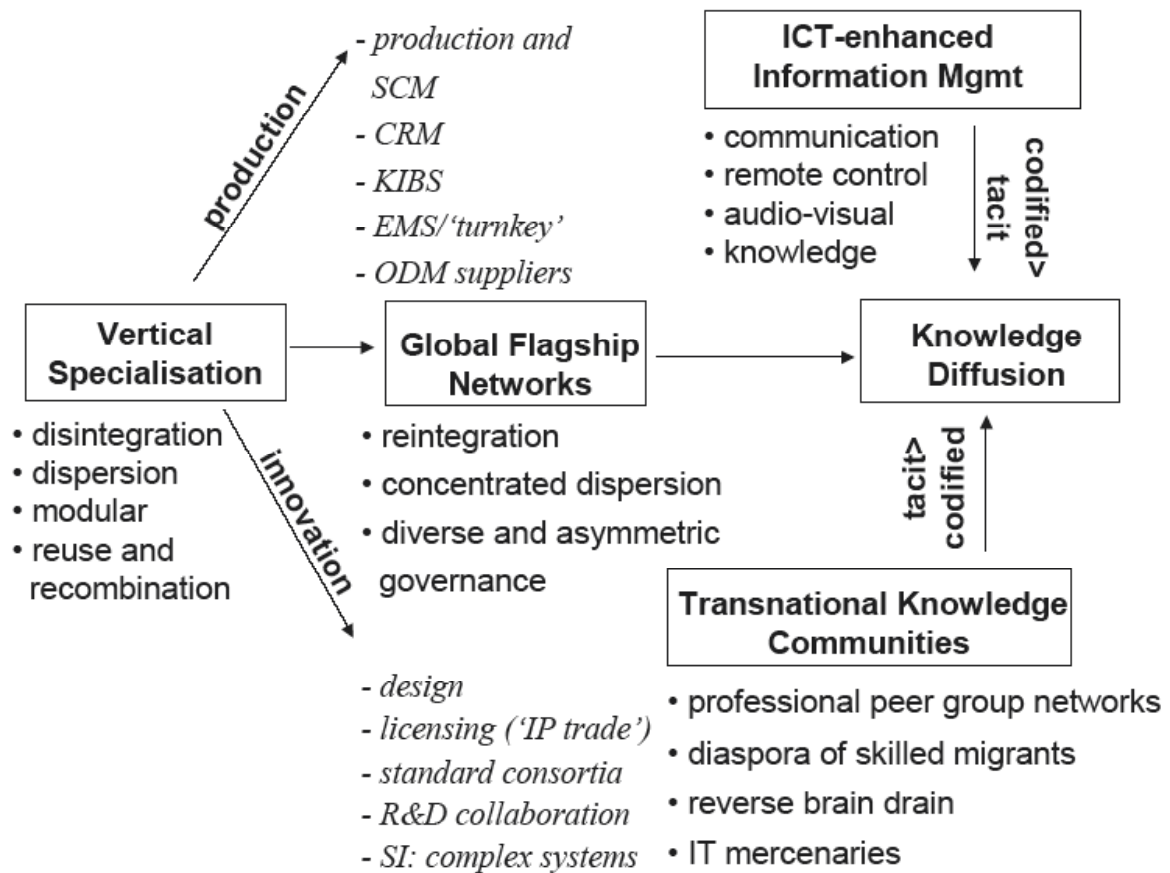
- Morshidi, Sirat (2000), 'Globalising Kuala Lumpur and the strategic role of the producer services sector', *Urban Studies*, Vol.37, pp.2217–241.
- National Economic and Social Development Board (2006), *Domestic Product and Gross Regional Product (1997-2004)*, Bangkok: NESDB.
- National Statistical Office, South Korea (2002), *Regional Statistics Yearbook 2002*, Seoul: NSO.
- National Statistical Office, South Korea (2006), *Korea Statistical Yearbook*, Seoul: NSO.
- Olds, Kris (2001), *Globalization and Urban Change: Capital, Culture and Pacific Rim Mega Projects*, New York: Oxford University Press.
- Olds, Kris and Yeung, Henry Wai-chung (2004), 'Pathways to global city formation: a view from the developmental city-state of Singapore', *Review of International Political Economy*, Vol.11(3), pp.489-521.
- Park, Bae-Gyoon (2005), 'Spatially selective liberalization and graduated sovereignty: Politics of neo-liberalism and "special economic zones" in South Korea', *Political Geography*, Vol.24, pp.850-73.
- Peck, Jamie and Yeung, Henry Wai-chung (eds.) (2003), *Remaking the Global Economy: Economic-Geographical Perspectives*, London: Sage.
- Phelps, Nicholas A. and Fuller, C. (2000), 'Multinationals, intracorporate competition, and regional development', *Economic Geography*, Vol.76(3), pp.224-43.
- Phelps, Nicholas A., Lovering, John and Morgan, Kevin (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*, Vol.5(2), pp.119-37.
- Phelps, Nicholas A. and Waley, Peter (2004), 'Capital versus the districts: a tale of one multinational company's attempt to disembed itself', *Economic Geography*, Vol.80(2), pp.191-215.
- Pike, Andy (2006), "'Shareholder value" versus the regions: the closure of the Vaux Brewery in Sunderland', *Journal of Economic Geography*, Vol.6, pp.201-22.
- Poon, Jessie, Hsu, Jinn-Yuh and Suh, Jeongwook (2006), 'The geography of learning and knowledge acquisition among Asian latecomers', *Journal of Economic Geography*, Vol.6, pp.541-59.
- Poon, Jessie and MacPherson, Alan (2005), 'Innovation strategies of Asian firms in the United States', *Journal of Engineering and Technology Management*, Vol.22(4), pp.255-73.

- Rasiah Rajah (2006), 'Electronics in Malaysia: export expansion but slow technical change', in Vandana Chandra (ed.), *Technology, Adaptation, and Exports: How Some Developing Countries Got It Right*, Washington, DC: World Bank, pp.127-61.
- Rodríguez-Pose, Andrés and Gill, Nicholas (2004), 'Is there a global link between regional disparities and devolution?', *Environment and Planning A*, Vol.36(12), pp.2097-118.
- Rodríguez-Pose, Andrés and Storper, Michael (2006), 'Better rules or stronger communities? On the social foundations of institutional change and its economic effects', *Economic Geography*, Vol.82(1), pp.1-25.
- Saxenian, AnnaLee (2002), 'Transnational communities and the evolution of global production networks: the cases of Taiwan, China and India', *Industry and Innovation*, Vol.9(3), pp.183-202.
- Saxenian, AnnaLee (2006), *The New Argonauts: Regional Advantage in a Global Economy*, Cambridge, MA: Harvard University Press.
- Saxenian, AnnaLee and Hsu, Jinn-Yuh (2001), 'The Silicon Valley-Hsinchu connection: technical communities and industrial upgrading', *Industrial and Corporate Change*, Vol.10(4), pp.893-920.
- Schoenberger, Erica (1997), *The Cultural Crisis of the Firm*, Oxford: Basil Blackwell.
- Schoenberger, Erica (2000), 'The management of time and space', in Gordon L. Clark, Maryann A. Feldman, and Meric S. Gertler (eds.), *The Oxford Handbook of Economic Geography*, Oxford: Oxford University Press, pp.317-32.
- Scott, Allen J. (ed.) (2001), *Global City-Regions: Trends, Theory, Policy*, Oxford: Oxford University Press.
- Scott, Allen J. (2006), 'The changing global geography of low-technology, labor-intensive industry: clothing, footwear, and furniture', *World Development*, Vol.34(9), pp.1517-536.
- Scott, Allen J. and Storper, Michael (2003), 'Regions, globalization, development', *Regional Studies*, Vol.37(6/7), pp.579-93.
- Sheppard, Eric (2002), 'The spaces and times of globalization: place, scale, networks, and positionality', *Economic Geography*, Vol.78(3), pp.307-30.
- Shin, Jang-Sup and Jang, Sung-Won (2005), *Creating First-Mover Advantages: The Case of Samsung Electronics*, Unpublished Manuscript, Department of Economics, National University of Singapore.
- Simmie, James (ed.) (1997), *Innovation, Networks and Learning Regions?*, London: Jessica Kingsley.

- Smith, Adrian, Rainnie, Al, Dunford, Mick, Hardy, Jane, Hudson, Ray and Sadler, David (2002), 'Networks of value, commodities and regions: reworking divisions of labour in macro-regional economies', *Progress in Human Geography*, Vol.26(1), pp.41-63.
- Smith, Neil (1984), *Uneven Development: Nature, Capital and the Production of Space*, Oxford: Basil Blackwell.
- Smakman, Floortje (2003), *Local Industry in Global Networks: Changing Competitiveness, Corporate Strategies and Pathways of Development in Singapore and Malaysia's Garment Industry*, Amsterdam: Rozenberg Publishers.
- Stiglitz, Joseph E. (2001), 'From miracle to crisis to recovery: lessons from four decades of East Asian experience', in Joseph E. Stiglitz and Shahid Yusuf (eds.), *Rethinking the East Asian Miracle*, New York: Oxford University Press, pp.509-26.
- Stiglitz, Joseph E. and Yusuf, Shahid (eds.) (2001), *Rethinking the East Asian Miracle*, New York: Oxford University Press.
- Storper, Michael (1997), *The Regional World: Territorial Development in a Global Economy*, New York: Guilford Press.
- Sturgeon, Timothy J. and Lester, Richard K. (2004), 'The new global supply base: new challenges for local suppliers in East Asia', in Shahid Yusuf, M. Anjum Altaf and Kaoru Nabeshima (eds.) *Global Production Networking and Technological Change in East Asia*, World Bank, DC: Oxford University Press, pp.35-87.
- Swyngedouw, Erik A. (2000), 'Authoritarian governance, power, and the politics of rescaling', *Environment and Planning D: Society and Space*, Vol.18(1), pp.63-76.
- Takayasu, Ken'ichi and Mori, Minako (2004), 'The global strategies of Japanese vehicle assemblers and the implications for the Thai automobile industry', in Shahid Yusuf, M. Anjum Altaf and Kaoru Nabeshima (eds.) *Global Production Networking and Technological Change in East Asia*, World Bank, DC: Oxford University Press, pp.209-53.
- Taylor, Michael and Asheim, Bjorn T. (2001), 'The concept of the firm in economic geography', *Economic Geography*, Vol.77(4), pp.315-28.
- UNCTAD (2005), *World Investment Report 2005: Transnational Corporations and the Internationalization of R&D*, New York: United Nations.
- Unger, Danny (1998), *Building Social Capital in Thailand: Fibers, Finance, and Infrastructure*, Cambridge: Cambridge University Press.
- van Hoesel, Roger (1999), *New Multinational Enterprises from Korea and Taiwan: Beyond Export-Led Growth*, London: Routledge.
- Wade, Robert (1990), *Governing the Market: Economic Theory and the Role of Government in East Asian Industrialization*, Princeton, NJ: Princeton University Press.

- Wei, Yehua Dennis (2000), *Regional Development in China: States, Globalization and Inequality*, London: Routledge.
- Weiss, Linda (1998), *The Myth of the Powerless State: Governing the Economy in a Global Era*, Cambridge: Polity Press.
- Weiss, Linda (ed.) (2003), *States in the Global Economy: Bringing Domestic Institutions Back In*, Cambridge: Cambridge University Press.
- Wong, Poh Kam (2001), 'Flexible production, high-tech commodities, and public policies: the hard disk drive industry in Singapore', in Frederic C. Deyo, Richard F. Doner and Eric Hershberg (eds.), *Economic Governance and the Challenge of Flexibility in East Asia*, Lanham, MD: Rowman & Littlefield, pp.191-216.
- Woo-Cumings, Meredith (ed.) (1999), *The Developmental State*, Ithaca, NY: Cornell University Press.
- Yang, You-Ren and Hsia, Chu-Joe (2006), 'Spatial clustering and organizational dynamics of trans-border production networks: a case study of Taiwanese IT companies in the Greater Suzhou Area, China', *Environment and Planning A*, Vol.38.
- Yeung, Henry Wai-chung (2005a), 'Rethinking relational economic geography', *Transactions of the Institute of British Geographers*, New Series, Vol.30(1), pp.37-51.
- Yeung, Henry Wai-chung (2005b), 'The firm as social networks: an organizational perspective', *Growth and Change*, Vol.36(3), pp.307-28.
- Yeung, Henry Wai-chung (2007), 'From followers to market leaders: Asian electronics firms in the global economy', *Asia Pacific Viewpoint*, Vol.48(1).
- Yusuf, Shahid, Altaf, M. Anjum and Nabeshima, Kaoru (eds.) (2004), *Global Production Networking and Technological Change in East Asia*, World Bank, DC: Oxford University Press.
- Zhang, Jingxiang and Wu, Fulong (2006), 'China's changing economic governance: administrative annexation and the reorganization of local governments in the Yangtze River Delta', *Regional Studies*, Vol.40(1), pp.3-21.
- Zweig, David (2002), *Internationalizing China: Domestic Interests and Global Linkages*, Ithaca, NY: Cornell University Press.

Figure 1. Changing industrial organization and global production networks and their impact on knowledge diffusion



Source: Ernst (2005: Figure 1, p.11).

Figure 2. High growth regions in East Asian economies

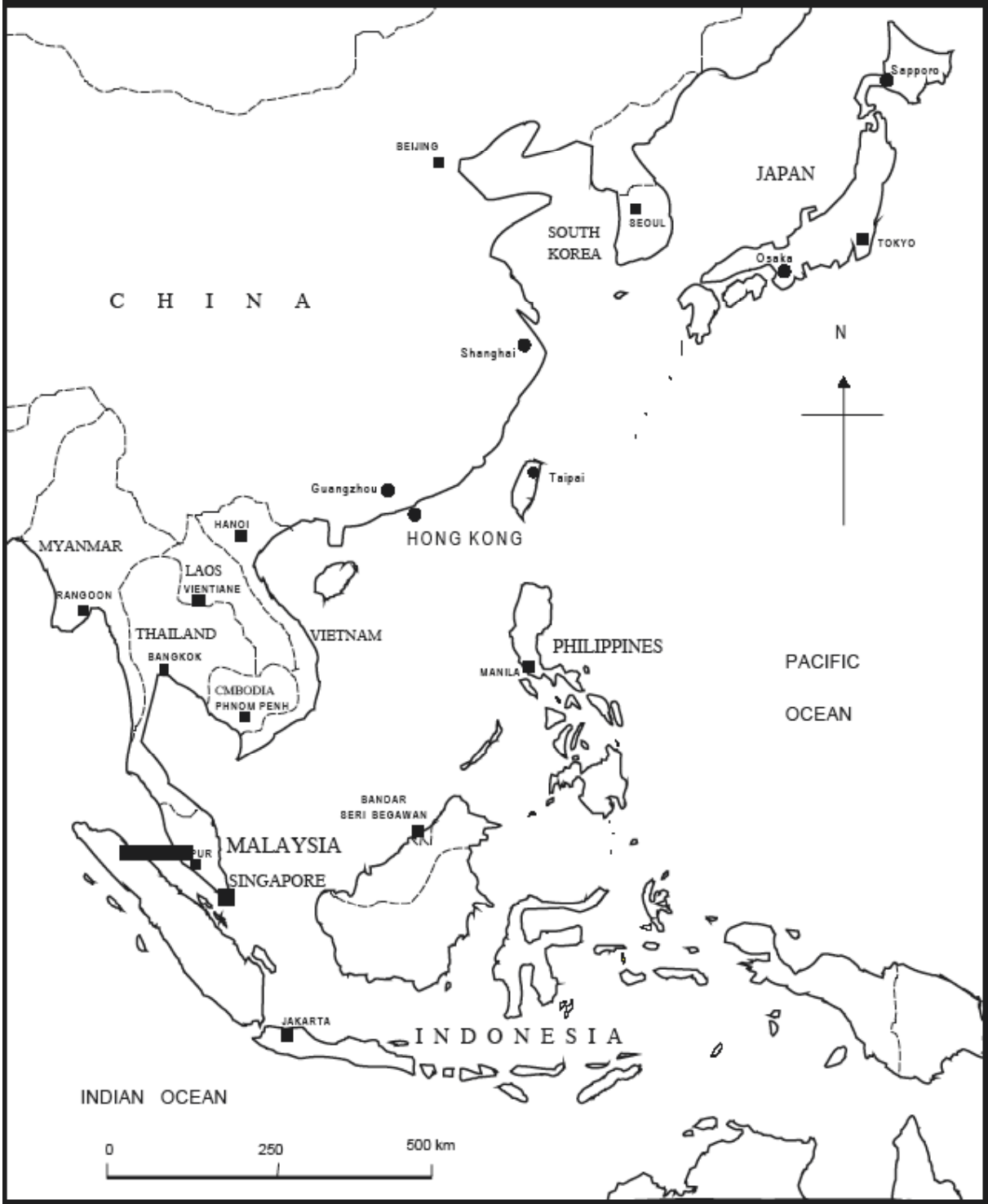


Table 1. Economic statistics on growth regions in East and Southeast Asia
(Population in 10,000 persons, employment in thousands, and value in billions in local currencies)

China (RMB)	2004 Population	% of total	2004		2004		2004		2004		Growth rate between 2004 and 2000 (%)			
			Gross regional product	% of total	Value added of enterprises	% of total	Gross industrial output	% of total	Gross capital formation	% of total	Gross Value added regional of enterprises product			
Total	129988	-	13688	-	5481	-	6282	-	6235	-	53	115.8		
Shanghai	1742	1.3	745	5.4	343	6.3	349	5.6	361	5.8	63.7	103		
Jiangsu	7433	5.7	1540	11.3	645	11.8	771	12.3	803	12.9	79.5	148.1		
Zhejiang	4720	3.6	1124	8.2	417	7.6	538	8.6	575	9.2	86.1	167.3		
Guangdong	8304	6.4	1604	11.7	709	12.9	801	12.8	637	10.2	66	107.3		
South Korea (Won)	2000 Population		2004 No. of mfg establishments		2004 No of workers		2004 Value of shipments		2001 Gross output		2004 No of mfg establishments		Growth rate between 2004 and 2000 (%) No of workers	Value of shipments
Total	4614	-	113310	-	2798	-	788633	-	17011	-	15.5	5.5	41	
Seoul	990	21.5	19264	17	267	9.5	38412	4.9	4881	28.7	4.7	-4.3	18	
Gyeonggi-do	898	19.5	34766	30.7	823	29.4	189642	24	545	3.2	20.1	10	30.5	
Taiwan (NT)	2004 Population		2001 No of mfg establishment		2001 No of employment		2001 Wages		2001 Gross output		2001 No of establishment (all sectors)		Growth rate between 2001 and 1995 (%) No of employment	Gross output
Total	2269	-	147340	-	6655	-	3020	-	17011	-	8.66	1.16	25.1	
Taipei city	262	11.5	8605	5.8	1635	24.6	876	29	4881	28.7	3.13	8	48.74	
Hsinchu city	38.7	1.7	2636	1.8	165	2.5	84	2.8	545	3.2	8.44	26.94	71.43	
North region ¹	NA	NA	62588	42.5	3677	55.3	1773	58.7	10049	59.1	6.14	3.07	30.57	

Table 1 (cont'd). Economic statistics on growth regions in East and Southeast Asia
(Population in 10,000 persons, employment in thousands, and value in billions in local currencies)

Malaysia	2005		2002		2002		2002		Growth rate between 2002 and 2000 (%)					
	Population	% of total	No of mfg establishment	% of total	Mfg employment	% of total	Wages	% of total	Mfg gross output	% of total	No of mfg establishment	Mfg employment	Wages	Mfg gross output
(RM)														
Total	2613	-	19705	-	1489	-	27.2	-	456.5	-	-3.7	-5.5	4.2	3.8
Penang	147	5.6	1645	8.3	297	19.9	5	18.4	77.8	17	-7.9	24.8	8.7	-5.7
Johor	135	5.2	3660	18.6	196	13.2	4.3	15.8	78.3	17.2	2.3	-36.2	-10.4	-0.4
Selangor	474	18.1	3469	17.6	393	26.4	8.8	32.4	132.2	29	1	3.1	12.8	9.3
Thailand	2004		2004		2004									
(Baht)	Population		Gross regional product		Mfg gross output									
Total	6420	-	6577	-	2312	-								
Bangkok and vicinities	1114	17.4	2899	44.1	1104	47.8								
Eastern region	434	6.8	998	15.2	528	22.8								

Notes:

¹ Including prefectures of Taipei, Taoyuan, Hsinchu, and Yilan.

Sources: China Statistics Press (2005: Tables 3-1 on p.51, 3-11 on p.59, 4-3 on p.94, 14-2 on p.489), National Statistical Office, South Korea (2002: Table III-3, p.130; 2006: Tables II-11 on p.146, V-1 on p.319), Executive Yuan, ROC (2003: Table 3 on p.3, Table 23 on p.43, Table 51 on p.428; 2005: Table 13 on p.22), Department of Statistics, Malaysia (2003/2006: Tables 2.1 and 5.1.), and National Economic and Social Development Board (2006).