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National Strategies in Managing the Transition toward a Knowledge Society/Economy: Same Dream, Different Beds?

Introduction

The international system is characterized by increasing complexity and, paradoxically simultaneous trends toward integration and fragmentation. Its complexity is apparent in the existence of a system of multilayered and diffused governance, with co-existing supranational, regional, national and sub-national levels rather than a global level monopoly. This introduces considerable ambiguity into the system as regards the exact location of authority, its fragmentation, and in terms of the management of overlapping jurisdictions and rules. The main structural changes experienced by societies and the international system are determined not just by globalization but also by the interplay between globalization and the emergence of "knowledge-based societies," which have generated a complex process of "glocalisation." This poses new and complex challenges for states and societies, which are attempting to address them by rethinking development policies, governance models and the relation between state and society in the context of renewed strategic thinking.

This paper makes a comparative analysis of the experience of the three dominant OECD economies (the US, EU and Japan), and

[1] IEEI, Lisbon.

three major emerging powers (China, Brazil and India) with designing and implementing a strategy towards a knowledge society in order to understand their goals and priorities and the extent to which there is convergence among the strategies adopted. The paper is divided into three parts. The first discusses the fundamental features of a knowledge society and its associated paradigm in the context of the process of globalisation. The second compares the national strategies adopted by the six countries/regions, identifying areas of convergence and divergence. The third part discusses "knowledge regions" as key players, and discusses the potential impact of an emerging paradiplomacy in the broader context of changes in foreign policy that the new knowledge society paradigm is likely to bring about.

Glocalisation and the Knowledge Society

Social change and developments affecting the international system are being shaped not just by globalisation but above all by the interaction between three inter-related but distinct processes: globalisation; the emergence of knowledge societies and economies; and the emergence of the "network society." Because of these partially complementary and partially contradictory processes there is a major paradigm shift affecting societal structures, the workings and structure of economies and markets, and how states operate and citizens relate to each other and the state.

Globalisation

Globalisation has been widely discussed but remains a rather ambiguous concept with at least four different meanings.[1] One view is that globalisation is internationalisation, consisting of an intensification of interaction and increasing state interdependence. A second view equates globalisation with liberalization, or the elimination of barriers to the free flow of goods, capital and people, and the reduction of state restrictions and deregulation. Globalisation has also been seen as a universalising force, implying the creation of global norms and values (by states) and a grad-

[1] Dominique Moisi (2001), IFRI.

ual reduction of cultural differences. Finally, globalisation can also be interpreted as de-territorialisation, or the loss of relevance of the territory as the fundamental basis of organisation of Westphalian sovereign states, as transnational networks and new forms of social organisation that transcend territorial borders have emerged and non-state actors become increasingly influential at the international level. These different views reflect divergent but complementary facets of what is a complex phenomenon. While the first three views are essentially state-centric and focus on quantitative processes that are not new (have been evolving since the 16th century), the latter interpretation implies a qualitative change and distances itself from the state-centric approach stressing the new role and influence of non-state actors.

Globalisation tends to be seen as an essentially economic phenomenon although it is more complex and incorporates other dimensions. As argued by Michalet, even if it is interpreted solely as an economic process, globalization is not just about the intensification and acceleration of flows but also about the diversification of the nature of these flows,[1] comprised of a three part sequence starting with international trade and the rapid expansion of the exchanges of goods and services, which started in the 16th century and deepened in the 19th and 20th centuries, following the logic of static comparative advantages; continuing with the expansion of FDI flows starting in the 1960s (which involved the globalisation of mass production and the reallocation of TNC productive capacity according to a logic of dynamic comparative advantages); and culminating in capital market development with the expansion of capital flows starting in the 1980s as a result of liberalisation of capital movements and the strengthening of national regulation, in which short-term capital and "hot money" have played a significant role. However, globalisation is not just an economic phenomenon but rather a multidimensional process. It has a security dimension, related to the new relevance of dif-

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[1] Michalet (2000).

fuse non-traditional, non-military threats linked with organised crime, terrorism, new diseases, and drug and human trafficking at the global level which developed in parallel with trade and investment. It has an environmental dimension and a political dimension, too. It is also an asymmetrical process, with rapid advances in areas like trade, finance, technology, organised crime, international terrorism, and skilled labour movements but very slow progress in the development of international and national regulations and institutions, as well as social attitudes.

The Knowledge Society and Economy

The intertwined emergence of the "knowledge economy and society" and the "network society,"[1] runs parallel to and interacts with globalisation, and has given rise to the apparently competing trend of localisation, or the renewed importance of the local and micro-regional levels. Indeed, the international system has been experiencing not just globalisation but, to be more precise, a dual process of "globalisation cum localisation," or as some authors would have it, "glocalisation" or "fragmegration."[2] Michael Enright[3] argues that this is only an apparent paradox as these twin processes are essentially complementary insofar as localisation of competitive advantages of firms is a necessary condition to compete in the global market. In other words, in order to succeed at the global level firms must first consolidate knowledge creation and innovation capabilities within local/regional clusters and networks, as innovation has become the main force driving competitiveness. It will be argued below, however, that despite the emphasis on complementarity, there are points of tension between globalisation and the knowledge society.

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[1] The network society has been mainly analysed by Manuel Castells. See Castells (2003).

[2] See James Rosenau (2002: 70-86).

[3] Enright (2001).

duction (new products, production processes and organizational methods), and innovation becomes the key to competitiveness. The most valuable aspect in the production of knowledge is investment not in physical capital but in intangible assets: human capital, knowledge capital and social capital. In the knowledge society, social activities are particularly geared toward the production, distribution and effective use of knowledge. This generates the capacity to innovate and create new ideas, thoughts, processes and products and to translate them into economic value and wealth. A knowledge society is also a "learning society," in which learning and "learning how to learn" becomes a priority that conditions the sustainability of the process. The OECD estimates that more than 50 per cent of GDP in major member economies is now knowledge-based.[1]

When stressing the centrality of the process of knowledge creation and diffusion it is important to note that there are different types of knowledge and that some have a higher strategic value than others. It is possible to distinguish between *know-what* (knowledge about facts), *know-why* (scientific knowledge of the principles and laws of nature, and of causes, processes and consequences), *know-how* (the skill or ability to do something requiring experience, a type of knowledge that tends to be kept within organisations), and *know-who* (who knows what and who knows how to do what, which involves special social relationships and trust). From this follows an important distinction to be made between two fundamental types of knowledge, namely: "coded knowledge" (know-what and know-why), which can be equated with information and is easily acceded through databases, books or lectures; and "tacit knowledge" (know-how and know-who), which is more difficult to access to insofar as it presupposes practical experience and social practice, in particular know-who, which is socially embedded knowledge that is not easily transferred through formal channels.

Tacit knowledge is the most decisive and strategic variety of knowledge because it is crucial for interpreting, selecting and integrating coded knowledge, and for learning new skills and casting aside old ones. Moreover, with advances in information technologies and increasingly cheap and easy access to vast reserves

[1] OECD (1996).

of information, tacit knowledge becomes more relevant because it is scarcer and because the selection and interpretation of coded knowledge becomes paramount. Unlike for coded knowledge, the creation and diffusion of tacit knowledge requires social contextualisation, face-to-face interaction, and trust, and it is unlikely to be transferred on an anonymous basis. This is where the "network society" comes into play, because social networks involve a diversity of actors and contribute to the upgrading of the level of social capital (the capacity of members of a society to develop mutual trust and work toward common goals),[1] a fundamental condition for the creation of tacit knowledge. Tacit knowledge is considered to be transferable only among actors who share norms and values and possess a high level of social capital. Given the decisive role played by tacit knowledge and the fact that its creation requires direct social interaction within a given territory, it becomes clear how knowledge society and network society processes contribute to the territory to regain importance though in a different way: not because it is controlled by the state or is the basis for the exercise of sovereignty, but because of the relevance of the social activity and the density of knowledge networks within it. Knowledge creation became a territorialized phenomenon insofar as it enables national/regional actors to develop trust, settle differences, form networks, develop partnerships and engage in mutual learning. From this perspective, the knowledge society and economy work against the opposite process of de-territorialisation set in motion by globalisation. Consequently, the local and regional levels gain a new strategic value, because they become the optimal arenas to create and operate knowledge networks that produce and diffuse tacit knowledge.

There is insufficient research on glocalisation and twin global-local processes to pinpoint their essence and the dynamics of the interplay between them. However, it is clear that they are both complementary and diverging trends, with tensions and contradictory effects between them at different levels. First, as noted above, while globalisation reduces the relevance of territory the knowledge society gives it new strategic significance. Second, globalisation generates a concentration of economic power, set-

[1] In the sense of the concept developed by Putnam, see Putnam (1993).

ting in motion a complex process of mergers and acquisitions, while the knowledge society tends to generate greater dispersion of power and assets and stimulate cooperation. Third, in terms of policy responses, globalisation requires regulation against monopolies or dominant positions and strict enforcement of competition rules, while the knowledge society or economy calls for greater cooperation between firms, universities, research centres, local governments, NGOs and other actors in knowledge networks, as well as greater tolerance toward practices that can be perceived formally as violating competition rules. In other words, the new knowledge society paradigm has far reaching institutional and regulatory implications insofar as it requires more flexible rules in several areas, notably competition and intellectual property rights, in order to remove major obstacles to knowledge diffusion.[1] Fourth, globalization is pushing macro-regionalism insofar as macro-regions permit economies of scale, rationalization of production systems and transaction costs, and the development of transparent competition rules. Interestingly, the knowledge-based society has worked in a different direction introducing the dimension of "localisation" and stimulating the development of an apparent opposite trend of micro-regionalism. From the above account it is possible to conclude that the complementary and contradictory aspects of glocalisation make the challenges faced by societies and states even more complex, and call for new policies, new institutions and new strategic thinking.

Strategies towards the Knowledge Society

In recent years, with differing degrees of intensity, various societies and states have been defining strategies to establish knowledge societies to strengthen social, organizational and individual capabilities to take on the challenges thrown up by the new par-

[1] It should be mentioned that the current level of regulation is largely uneven with advances in regulation in areas such as trade or some environmental aspects but a clear deficit in key priority areas which are in need of urgent international regulation: epidemics and health risks, genetic engineering, environment, international terrorism, global financial system or the internet just to mention some of the more pressing.

adigm. "Strong states" in particular,[1] which have greater institutional capacity and influence in the international system, have tried to meet the challenges of glocalisation through both short term strategies to minimise negative impacts and long term strategies to enhance their structural position by consolidating strengths and addressing weaknesses. The transition to the knowledge society or economy is a good example of the second response. It has been pursued with three main goals in mind: strengthening the competitive advantages and position of national economies in the global economy, marked by a fierce intensification of competition, in recognition of the centrality of the knowledge-innovation-competitiveness triangle; reinforcing the legitimacy of governments, which has been severely undermined because of increasing social protest by groups excluded from the benefits of globalisation and the increasing influence of non-state actors; and improving the management of high level risks associated with increasing uncertainty at the international level, by strengthening social cooperation. Because of this, since the late 1990s the new knowledge society paradigm has gradually become a part of political agendas and an issue for policy-makers. This has led to the formulation of strategies to facilitate and accelerate the transition to knowledge societies/economies.

Main Aspects of National Strategies

The EU Lisbon Strategy

Over the last two decades, the EU has made macro-regional progress with the single market and with trade and monetary policies to confront the challenges of globalization. However, thus far it has not delivered the expected results in terms of growth and social cohesion. On the whole, the EU transition to the knowledge based society has been less successful and progress much slower than hoped for. The initiative to launch the Lisbon Strategy in 2000 aimed precisely to close this gap and speed up the transition to a knowledge society and economy to enhance global EU competitiveness. As formulated ambitiously in the Lisbon Strategy

[1] The distinction between positive and negative sovereignty has become even more relevant as globalisation has contributed to widen the gap between strong states, which have been able to consolidate positive sovereignty, and weak states, which have only negative and not positive sovereignty. See Jackson (1993).

document: "The *Union has today set itself a new strategic goal for the next decade: to become the most competitive and dynamic knowledge-based economy in the world capable of sustainable economic growth with more and better jobs and greater social cohesion*" (European Council Conclusions 23-24 March 2000).

The most striking and innovative aspect of the Lisbon Strategy is not so much the ambition of its goals (making the EU the "most competitive" region in the world by 2010, which many observers considered unrealistic from the start), but rather the aim of balancing competitiveness with social cohesion, such that it is based on three pillars: economic competitiveness, or broad-based growth with high employment creation potential; social equity and cohesion, with the reduction of asymmetries and poverty; and environment protection and sustainability. All pillars are equally important and mean to be coordinated so that progress in one area is not obtained at the expense of another. In other words, growth must be compatible with social and environmental goals.

The Lisbon Strategy is a multidisciplinary and multidimensional strategy which presupposes attaching greater importance to specific policy areas as well as, and more importantly, exploring the links between them in order to ensure greater coherence, coordination and an integrated approach. The Lisbon Strategy also recognises that social policy can be efficiency-enhancing and that social security systems must be restructured. Specific policy areas were identified as priorities for the knowledge society, and concrete targets were later outlined in the Integrated Guidelines of the Lisbon Strategy for Growth and Jobs, approved in 2005 by the Council of the European Union.[1] The priority areas, which presuppose the existence of a stable macroeconomic environment, include:

- *Information Society and Communications Technology (ICT) Policy*: The e-Europe Plan was launched and greater emphasis placed on ICT diffusion within public services (schools), households and firms, particularly SMEs, in order to develop E-Learning, E-Government and E-Commerce, and to create an inclusive information society.[2]

[1] Council of the European Union (2005a) and (2005b).

[2] *Broad Economic Policy Guidelines*, guideline 9.

- *R&D policy:* The main concern is to overcome the low level of R&D investment in the EU by increasing public and private investment in R&D at national and EU levels, creating a European Research Area (ERA) with networking R&D programmes and institutions, and establishing a European Technology Institute. The Action Plan to invest in research is meant to raise the current average level of 1,95 per cent of GDP investment in R&D to 3 per cent by 2010,[1] with two thirds of the investment to be undertaken by the private sector (an increase of about €100 billion).
- *Enterprise Policy*: The goal is to create better conditions for entrepreneurship through administrative and legal simplification, better regulation, the enforcement of competition rules, increased access to venture capital, and through education for entrepreneurship.
- *Innovation Policy*: The main focus is to improve innovation support services, the creation of innovation poles and incubators by promoting clusters, the enforcement of Intellectual Property Rights and the creation of a European Patent.
- *Education and Training and Investment in Human Capital*: The emphasis is on lifelong learning, a reduction of the number of early school leavers, entrepreneurship education, lifetime workplace training, adapting education and training systems to meet new competence and future skill requirements.[2]
- *Employment Policies:* The main objective is to reduce unemployment, in particular youth unemployment, improve the quality and productivity at work to reach the target of an average employment rate of 70 per cent for the EU by 2010 (up from the current 61%, and at least 60% for women and 50% for older workers). Among other things, this involves the development of new jobs in services or greater flexibility combined with employment security, and reduced labour market segmentation with reformed labour legislation, promoting innovative and adaptable forms of work.[3] At the same time, there is a concern to ensure the sustainability of social protection systems (pensions and healthcare), support active ageing, and discourage early retirement.

[1] Ibid., Guideline 7.

[2] *Guidelines for the Employment Policies in Member States*, guidelines 23 and 24.

[3] Ibid., guidelines 17 and 21.

- E*nvironment and Synergies between Environmental Protection and Growth:* the focus is on energy efficiency – eco-efficient technologies, the internalisation of external environmental costs, combating climate change and implementing the Kyoto targets.[1]
- *Social Cohesion and Equity:* Improving equity by achieving a better redistribution of income and wealth, thereby reducing personal and regional inequalities and asymmetries, and reducing levels of poverty and exclusion.
- *Competition and Regulation Policies:* The main concern is to ensure enforcement of competition rules and better regulation to facilitate the reduction of the administrative burden, namely for SMEs and start-ups, and to encourage firms to develop corporate social responsibility.

A second innovation introduced by the Lisbon Strategy besides the adoption of an integrated and holistic approach to priority areas, was the adoption of a new institutional method, the open method of coordination based on mutual learning and benchmarking to identify best practices, which takes into account national and regional diversity and permits the adaptation of common objectives and best practices to national circumstances, at the same time it creates room for the participation of civil society.[2]

The first implementation phase of the Lisbon Strategy ended with the 2005 mid-term review. The main focus was on translating the Lisbon European Council conclusions into policy, adding the environmental dimension, introducing the basic mechanisms of implementation, and linking the Lisbon Strategy with the EU Constitutional Treaty.[3] Implementation was difficult and slower than initially expected for various reasons. First, Member States and national governments were identified as the central players and promoters of the Lisbon Strategy with little involvement by EU institutions. The Commission had no formal responsibilities, no coordinating or catalytic role to play and no financial resources. In many cases, national governments were slow to turn the Lisbon Strategy into national policy. Second, there was not suffi-

[1] *Broad Economic Policy Guidelines*, guideline 11.

[2] See Maria João Rodrigues, "Strategy and Governance for the Knowledge Economy" *in* Maria João Rodrigues (2003a).

[3] See Maria João Rodrigues (2006)

cient recognition of the multidisciplinary nature of the process and the complexity of the linkages between different areas and there were no mechanisms to achieve enhanced coordination and coherence between economic, employment, social and environmental policy. Third, contradictions and tensions between the Lisbon Strategy and the Stability Pact (with its emphasis on budget deficit controls), poses problems, as the Lisbon Strategy calls for additional public investment in strategic areas. Fine-tuning the Stability and Growth Pact is a must if the implementation of the Lisbon Strategy is to be viable. Fourth, the regional dimension was not fully integrated and the critical role of knowledge regions not addressed, as the emphasis was all on national action and programmes. The 2005 Mid-Term Review addressed some of these problems and aimed to revitalise the Lisbon Agenda. It provided a clearer definition of operational targets and indicators to assess progress translated into the Broad Economic Policy Guidelines and the Guidelines for the Employment Policies in Member States; it clarified the allocation of responsibilities of EU institutions and how to ensure coordination and complementarity between national and EU policies and resources (on the basis of the guidelines Member States will draw up "national reform programmes" and the Commission a "Community Lisbon Programme"), it provided for a financing structure (the Financial Perspectives 2007-2013 must provide the adequate funds to implement the Lisbon Strategy), and it recognised more clearly the strategic role of the regional dimension and the cluster approach.

China is embracing a far reaching paradigm shift based on new concepts formulated by leading academics and think-tanks, which are already having a clear impact on long term priorities

China

Despite impressive economic performance and an average growth rate of 9 per cent over the last decade, China has experienced unbalanced growth and several weaknesses and vulnerabilities, including increasing interregional and interpersonal inequality, unemployment, environmental degradation and resource-energy scarcity. Consequently, China is embracing a far reaching paradigm shift based on new concepts formulated by leading aca-

demics and think-tanks, which are already having a clear impact on long term priorities outlined in recent policy documents. The emergence of the concept of the "second modernization"[1] signals a departure from China's ongoing first modernization (transition from an agricultural society and economy to an industrial society and economy), to one involving a transition from an industrial society and economy to a knowledge society/economy. This new concept appears in the China Modernization Reports series produced by the China Centre for Modernization Research of the Chinese Academy of Sciences.[2] It evidences two important innovations: it acknowledges regional disparities and that there can be no uniform national transition as different parts of China move at different speeds (some regions such as HK and Taiwan are already entering the second economic modernization stage while others are still in the throes of the first, with Shanghai and Beijing the frontrunners in this group); and it identifies three pillars of structural change, reflected in the last three reports (the 2005 report devoted to economic modernization, the 2006 report to social modernization, and the 2007 report to ecological modernization).

The new emerging "Beijing Consensus"[3] crafted by leading academics, think-tanks and government circles has also contributed to renewed strategic thinking. It is based on three fundamental ideas: innovation-led growth on the basis of strong R&D that can sustain endogenous innovation; improved equity by attenuating increasing social inequalities, addressing the situation of the most vulnerable groups and reinforcing social safety nets; and adopting an asymmetrical defense strategy, a new strategy to deal with security threats posed by major powers, namely the US, by exploring their military vulnerabilities. The "Beijing Consensus" provides new highly pragmatic and flexible set of political, developmental and global power concepts, linking internal policies and foreign policy, and provides China with an intellectual instrument model that stands as an alternative to the "Washington Consen-

[1] See He Chuanqi (Chinese Academy of Sciences), (1998, 1999a and 1999b). The process of the human history from about 2.5 million years ago to A D. 2100 is divided into four ages: the Stone Tool Age, Agricultural Age, Industrial Age and Knowledge Age, with each Age includes four phases: start phase, developing phase, mature phase and transition phase (total of sixteen phases).

[2] See www.modernization.com.cn/cmr2005/2006/2007.

[3] See Joshua Cooper Ramo (2004)

sus" and appeals to developing countries, thus consolidating Chinese leadership among such countries.

The formulation of a long term strategy to establish a knowledge society has been associated with the goal of establishing a "Harmonious Socialist Society," according to the guidelines in the "Resolution on Major Issues Regarding the Building of an Harmonious Socialist Society" adopted at the 6th Plenary Session of the 16th Central Committee of the Chinese Communist Party in October 2004. The aim is to establish a harmonious society by 2020, characterised by some fundamental features: wealthy; equitable, implying sharing the benefits of economic growth, a better distribution of social wealth and diminishing the gap between rural and urban populations and between regions; stable, with the consolidation of the legal system and the rule of law; value-driven, with harmony of values and interests, enhanced citizenship and high ethical standards. This reflects an effort to achieve more balanced development, as argued by Zhou Hong in her paper[1], and a new concept of development that includes "five balanced developments" namely: economic and social, rural and urban, coastal and hinterland, human and natural, and internal and open-door policy development. It is particularly interesting to note the strong linkage between domestic and foreign policy as Chinese foreign policy is primarily driven by the goal of ensuring a stable international environment and access to resources to ensure growth.

This strategy is to be implemented with the eleventh Five-Year Plan for 2006-2010, and it has two fundamental purposes. First, to correct the negative outcomes of the current model by addressing the problems and bottlenecks generated by more than two decades of sectorally and regionally imbalanced "extensive growth," which has drastically reduced levels of absolute poverty but is also generating growing social inequalities and environmental degradation. Second, it aims to launch a new model to ensure future competitiveness and prosperity in the global knowledge society. Specific targets reflect the three dimensions, economic, social and environmental, although there is limited fusion between them. The targets are to promote intensive and efficient growth to generate a high employment rate; to narrow the gap between rural-urban populations and between developed coastal

[1] See "A Chinese Perspective on the Lisbon Strategy", in this volume.

regions and poor inland regions; to establish a universal social security system both for urban and rural residents; to improve environmental conditions, harmony between people and the environment, with a special emphasis on air pollution, control of CO2 emissions, and water scarcity and quality; to improve the legal system; to enhance social creativity and develop an innovation-based nation (the "Sea Turtle" policy that promotes the return to China of Chinese researchers residing abroad is considered a relevant tool in this regard).

India

From the start of this decade, India began to formulate a long term development strategy that addresses the challenges and opportunities of the knowledge society/economy. India is increasingly perceived as an emerging economic power, with impressive growth rates averaging 8 per cent p.a. in the last 3 years and a forecast of 9 per cent for 2007-2010, and it is one of the most dynamic and promising global competitors of the future, associated with recent success in some knowledge-intensive sectors such as ICT and pharmaceuticals. However, it faces some problems: growth has been uneven and mostly concentrated in the service sector contrasting with low growth in agriculture, still the main economic sector accounting for nearly two thirds of total employment; there are important bottlenecks, most importantly poor infrastructure (roads, ports and energy), low agricultural productivity and skills shortage; the national growth pattern has a low employment generation capacity so that the unemployment rate is high (10% plus disguised unemployment); the persistence of high levels of poverty (20% of the population lives below the poverty line), as well as considerable income and wealth asymmetries; and growing environmental degradation.[1]

India is increasingly perceived as an emerging economic power, with impressive growth rates and it is one of the most dynamic and promising global competitors of the future.

The aims of the Indian knowledge society strategy are to address these vulnerabilities and enhance India's competitive posi-

[1] See World Economic Forum (2006).

tion in the global economy. A long term strategy was adopted for the period 2002-2012, and has been/will be translated into policy with the tenth Five-Year Plan (2002-2007),[1] and the eleventh Five-Year Plan (2008-2012). The strategy articulates economic, social and environmental goals. The central aim of the economic pillar is employment creation on a large scale, specifically the generation of 100 million new jobs by 2012, which requires the concentration of investment and resources in priority sectors with high growth and employment creation potential, in particular agriculture, construction, tourism, transports, retailing, and IT and communication services. In addition, a system of basic research is to be developed taking into account short-term goals (low cost personal computers, e-commerce, e-governance, e-learning, and multimedia), medium-term goals (wireless technologies, microelectronics, GPS hardware, next generation internet, and robotics) and long-term goals (nanotechnologies, bio-informatics). The social goals are to ensure universal elementary education by 2012, strengthen the higher education system with the creation of 50 new high quality national universities, and to reduce the poverty ratio and improve equity. Finally, the environmental pillar stresses the need to combine growth and environmental sustainability underlining four main priority areas: energy (energy-efficiency and security); water management and conservation, with a special emphasis on cleaning major polluted rivers; forest management and increasing forest coverage; and the development of organic farming.

The goal of building a knowledge society was further strengthened and the strategy to achieve it consolidated with the creation in 2005 of the National Knowledge Commission (NKC) under the direct supervision of the Prime-Minister. The mission of the NKC is to transform India into a knowledge society by recommending policies, assessing implementation and acting in the five main abovementioned areas so as to improve the educational system and build excellence; promotion of knowledge creation through a R&D system; promote knowledge application and innovation, particularly in agriculture and industry; implement institutional and regulatory reforms, namely to safeguard intellectual property rights; improve e-government and innovate in gov-

[1] National Planning Commission of India, *10th Five-Year Plan*, 2002 http://planningcommission.nic.in/plans/planrel/fiveyr

ernment in order to make it an effective, transparent and accountable service provider to the citizen.

The NKC process makes two fundamental and innovative contributions to the knowledge society strategy. It introduces a democratisation of the process, because it aims to build a people-oriented knowledge society centred on the citizen, which is likely to have a concrete and positive impact on daily life. In other words, the knowledge society is to be inclusive of all citizens, not just of a small elite, and should therefore not contribute to increasing social disparities. Interestingly enough, the Commission takes the "knowledge lifecycle" as its starting point, looking at the kinds of demands from and contributions to the knowledge society made by each citizen at different stages of their life (birth, infancy, childhood, young age, work age and post-work age). Secondly, it promotes horizontal coordination between different policy areas insofar as it brings together the Prime-Minister, the ministers of Agriculture, Human Resources, Science and Technology, Trade and Information Technology, thus fostering an holistic approach to the knowledge society.

Benefiting from the inputs of an extensive, participatory and multi-actor process of consultations involving universities, academics, NGOs, government departments, research laboratories, regulatory bodies, think-tanks, industry and multilateral agencies, the NKC issued a set of recommendations in 2006-2007[1] which focused on different areas regarded as critical for a successful paradigm shift (ranging from libraries, translation, language, knowledge networks, to vocational education and training, higher education and e-governance), all following a similar orientation: bringing knowledge and innovation close to citizens and ensuring access to it to ensure social inclusion.

Brazil

Brazil has engaged in continuous and consistent activity in this domain given strong political backing, and has formulated a strategy of transition to a knowledge society and economy anchored, as argued in Arbix and Salerno's paper[2], on two complementary

[1] See the set of policy documents at http://knowledgecommission.gov.in/

[2] See "The Lisbon Strategy in a Knowledge Society Without Borders: The Brazilian View", in this volume.

initiatives: the Brazil Three Times programme coordinated by the Presidency of the Republic (NAE) and the Guidelines for Industrial, Technology and Foreign Trade Policies (PICTE) coordinated by the Brazilian Agency for Industrial Development. The strategy, marked by a strong leadership of the federal government and limited involvement of states, focuses primarily on strengthening competitiveness through the development of a national system of innovation rooted in solid scientific and technological capabilities. Interestingly enough, science and technology is probably the only area where the role of state governments has been enhanced and there is some evidence of vertical coordination efforts between federal and state governments.

Brazil Three Times involves intensive horizontal coordination between the ministries of the sectors considered relevant for the knowledge society and lays out several strategic objectives to be reached until 2022, along seven major axes: economic (employment creation, improvement of infra-structure, macroeconomic stability, improvement of productivity); socio-cultural (reduce the income gap and social asymmetries, improve health standards, and value ethnic diversity); territorial (reduce regional disparities, promote regional integration with South America, and preserve and defend the territory); knowledge (reinforce the quality of education, improve access to information, strengthen the capacity to produce scientific and technological knowledge and turn it into innovation); the environment (preserve ecosystems, the sustainable use of energy, water and land, and improve the environmental quality of cities); institutional (strengthen democracy, citizenship and human rights, and improve public management and participatory policies); and global (active participation in world decision making *fora*, strengthened multilateralism and the development of new strategic alliances).[1]

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The PICTE is more restricted in scope and is focused on reinforcing the innovation capacity of Brazilian industrial firms to

[1] Núcleo de Assuntos Estratégicos da Presidência da República, "Projecto Brasil 3 Tempos 2007,2015,2022"

strengthen their competitiveness through three major types of policies: horizontal (strengthening institutional capacity and the adapting the institutional and regulatory environment to support innovation, and knowledge networks based on closer firm-university cooperation); the selection of strategic industrial sectors, namely semiconductors, software, capital goods and pharmaceuticals; and the development of priority strategic activities, in particular in biotechnology, nanotechnology, biomass and renewable energies.

Although the complementarity between PICTE and Brazil Three Times has been stressed, it is not clear how they are articulated, influence each other or to what extent they exert the same influence on policy-making. In fact, Arbix and Salerno clearly argue that PICTE has greater public visibility than Brazil Three Times and thus far is clearly the most influential instrument not just in government circles but also in business and academic circles. As a consequence, the predominance of the PICTE suggests that the economic pillar constitutes the dominant dimension in Brazil's strategy in spite of the recent government investment in social and poverty reduction programmes such as "Fome Zero" and "Bolsa Família".

Japan

Recovery after the lost decade of the 1990s in Japan has been marked by renewed impetus in terms of the formulation of a strategy to establish a knowledge society. This led to the ongoing process to produce the "Innovation 25" Strategy launched by Prime Minister Abe in October 2006, which is expected to conclude in June 2007. For the first time, the post of minister for innovation was created, and the "Innovation 25" Strategy Council set up, which has carried out a broad consultation with academics and the business sector. Although Japan has a long tradition of active technology and competitiveness policies, these have been mainly conceived at the company level. The new strategy presents two radically new perspectives: the adoption of a systemic view of competitiveness, and a broad concept of innovation no longer restricted to "technological innovation" but covering social innovation as well. As pointed out by the Innovation Minister: "In order to make innovative creation sustainable it is important for us to build a social framework that can lead to the

reinforcement of the nation's scientific and technological foundation and an effective use of innovative ideas."[1] The final version of the strategy document has yet to emerge, but an interim report[2], analysed in Eiji Ogawa' paper[3], envisages a long term strategy with a view to 2025 and identifies strategic objectives covering three main areas of innovation: science and technology (strengthening R&D with a focus on life science, information technology, engineering, ecology and energy; stronger industry-university networks to turn knowledge into innovation; a stronger intellectual property system); social innovation (the promotion of new values and new models of social dialogue, including between experts/scientists and ordinary people, and social cooperation that can bring about social innovation and better meet public needs); human resources innovation (to improve the quality of human capital, foster talents, including by attracting talent from abroad). Probably the most striking aspect of the policy is the unprecedented relevance attributed to social innovation, which emerges as the dominant dimension. It is thus recognised that innovation and economic competitiveness depends more than generally believed on social factors, in particular social capital insofar it determines the density of the knowledge networks and shapes the production of tacit knowledge.

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The United States

The US experience provides an interesting case of a de-centralized, diffused and bottom-up strategy, as mentioned in Kobayashi's paper[4], that, despite the absence of a single national compre-

[1] Journal of Industry-Academia-Government Collaboration, Japan Science and Technology Agency, January 2007 (online), see www.sangakukan.jp/journal, and http://sciencelinks.jp/contents

[2] Cabinet of the Prime Minister of Japan, *Interim Report "Innovation 25" – Creating the future, challenging unlimited possibilities*, Innovation 25 Strategy Council, 26 February 2007.

[3] See "Innovation 25" Plan in Japan" , in this volume.

[4] See " US Innovation Policy and Strategy for the Global Economy", in this volume.

hensive agenda, contributes to innovation and the transition to a knowledge economy because of the involvement of a broad range of actors. The process has been driven mainly by the private sector and civil society, in particular as a result of the consistent activity of the Council on Competitiveness which produced the Young Report in the 1980s as a response to rising Japanese competitive pressure, and, more recently, the Palmisano Report (2004) concerned with a wider range of potential competitors. These civil society initiatives have influenced and stimulated the formulation of the first ever public federal strategy, which was presented by the Bush Administration in 2006. The American Competitiveness Initiative[1] establishes a series of objectives and policy actions to be implemented until 2016, the central aim of which is to preserve American world leadership in science, technology and innovation. Its three mains strands are: strengthening human capital, in particular through the improvement of the education system and its quality as far as science, mathematics and technology education are concerned; reinforcing the I&D system and securing adequate levels of investment, including by increasing public funds; creating an adequate regulatory and institutional environment to stimulate a positive business climate to foster entrepreneurship.[2]

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A key feature of the US experience is clearly the important role of the US states which are increasingly active in formulating and implementing innovation policies, namely by promoting regional clusters, training the labour force and stimulating venture and risk capital by offering a variety of incentives and programmes. Interesting enough, as pointed out in Kobayashi's paper, although the dominant feature of the system is fierce competi-

[1] The White House (2006)

[2] The ACI sets specific quantitative targets to be achieved by 2015: 300.000 grants for schools to implement research-based math curricula and interventions; 10,000 more scientists, students, post-doctoral fellows, and technicians provided with opportunities to contribute to the innovation enterprise; 100.000 highly qualified math and science teachers by 2015; 700.000 advanced placement tests passed by low-income students; and 800.000 workers getting the skills needed for the jobs of the 21st century

tion between states, particularly the most advanced such as Michigan, North Carolina, Massachusetts, Virginia, Texas, Georgia, there is also a new element of cooperation which is best illustrated by the 2007 National Governors Association initiative on "Competition and Innovation".

Although the economic /R&D pillar tends to be dominant in the US perspective on innovation and transition to the knowledge economy, so that policies promoting innovation have not included social policies or addressed issues as social inequality or safety nets, Kobayashi argues that there are recent signs of expansion of the US innovation agenda to include social and environmental dimensions. The development on the social front is mostly visible at the state level. The US states, increasingly proactive in designing innovation strategies, have in some cases included social policies, concerned with the increasing income inequalities and the lack of safety nets, with several US states committed to strengthen the health care system, thus acknowledging the increasing connection between innovation and social welfare policy. As to the environment, Kobayashi highlights the new trend related to the new leadership in the Congress which has made global warming and energy security top priorities as well as the new attitude of the private sector, namely big firms, which have been adopting, on a voluntary basis, eco-friendly measures and higher environmental standards.

The third interesting aspect about the US case, is that the US experience suggests a certain level of coordination between domestic and foreign policy insofar this new knowledge society agenda has some impact at the foreign policy level with the new emphasis on what Kobayashi calls "Science and technology diplomacy" which is regarded as an effective "soft power" mechanism to pursue US foreign policy objectives.

Comparative Analysis

Areas of Convergence

There are four main areas of convergence between the strategies outlined above. First, all countries have adopted long term strategies for periods varying between 10 and 20 years (in some cases a decade (EU 2000-2010; US 2006-2016; India 2002-2012), in other

longer periods (Brazil 2007-2022; China 2005-2025; Japan 2007-2025). This reflects an important consensus that a crucial structural change and a paradigm shift are at stake, which will take time to effect, and the success of which requires a defined path, active government to facilitate strategic thinking and planning, and a participatory partnership between state and society. Second, there is a degree of convergence in terms of priority areas, in particular the recognition of the central role of the economic, social and environmental pillars, although the degree of importance attached to each varies. The issues of employment creation and the strengthening of the R&D system and human capital are top economic priorities; basic and higher education and the reduction of inequality and poverty are the central social issues; energy-efficiency and security emerge as the dominant environmental priorities followed by water management and quality (see table in Annex II). There is also an emerging consensus about a fourth horizontal pillar related to governance and institutional reform, to improve both horizontal (inter-sector policies) and vertical (different levels of government) coordination, which are essential to ensure coherence and bring about critical structural changes. Third, despite globalisation, the strategies are primarily domestic and have yet to adopt an external dimension. Thus, foreign policy or the priorities and concepts of foreign action have not yet been adapted to the new strategic goals, so that there is a gap between domestic and foreign policy. However, in some cases there are interesting signs of the gradual emergence of a new foreign policy influenced by the new agenda, which is more intense in the case of the US (with its soft power "science and technology diplomacy") and more marginal in China and Brazil (which cover South-South cooperation on human resources and scientific cooperation). Fourth, the implementation of the strategies, still at an early stage, is complicated by national diversity and increasing regional asymmetries, which implies a multi-speed transition. All countries have experienced the emergence of "knowledge regions," or more dynamic and competitive regions that are ahead of the curve (to cite some examples: Stockholm, Uusimaa, Baden-Wurttemberg, London or Ile de France in the EU; the Yangtze River Delta, the Pearl River Delta and the Bohai Rim regions in China; São Paulo state in Brazil; Tokyo or the Kansai region (Osaka, Kyoto) in Japan; Bangalore,

Mumbai and Hyderabad in India; and San José, Silicon Valley, Boston route 128, Wireless Valley or Seattle-Tacoma-Bellevue in the US). These knowledge regions tend to be active internationally and to develop permanent paradiplomacy activities, which may be a potential source of tension with central governments and thus require new forms of vertical coordination.

Areas of Divergence

There are five main points of divergence between the strategies. First, there are relevant differences in terms of initial points of departure, speeds and paths despite convergence in terms of challenges and priorities. There are clearly differences between the maturity of economic systems, capacity of innovation and competitiveness at the global level between the various economies: some EU economies (Nordic countries, Germany, Netherlands and United Kingdom) together with Japan and the US are among the top ten most competitive economies according to the 2006 Global Competitiveness Index,[1] while India (43rd), China (54th) and Brazil (66th), are at intermediate levels. As regards equity, levels of inequality as measured by the Gini coefficient also differ: Japan and the EU have a lower level of inequality (around 0.30); India has a medium level (0.38); the US (0.47), China (0.48) and Brazil (0.58) have high and rising levels of inequality. Second, although all acknowledge the importance of coordinating the economic, social and environmental dimensions, not all areas are equally important, so that the level of fusion and exploration of synergies between the three pillars varies. The EU (and India and China to a lesser extent) pursues a more balanced approach between the three pillars, which stresses the search for the synergies rather than trade-offs. In the cases of the US and Brazil the economic pillar is dominant, although Brazil has tried to rebalance the triangle through investment in social programmes, and recent signs of change have emerged in the US, as yet insufficient to change the picture. In Japan, although past economic stagnation has given the economic pillar most weight, the Innovation 25 strategy introduces an interesting change insofar as it attaches a renewed importance to the social pillar. It is also interesting to note that the Chinese strategy, particularly the "Beijing Consensus,"

[1] World Economic Forum (2006b).

introduces a security element that is not found elsewhere. Third, there is divergence in terms of strategy formulation models, particularly the degree of civil society and private sector participation. In China, Brazil and, to a lesser extent, Japan and the EU, States have played a dominant role and there has been limited input from other sectors. By contrast, the US has the most participatory model, with clear private sector leadership at some stages and a dynamic partnership between state and civil society at others. In India there is a significant degree of civil society participation, best illustrated by the work of the NKC. Fourth, ultimate rationales and primary goals about the knowledge society differ. There seem to be two coexisting but divergent conceptions: one that focuses on the formal system of" innovation, R&D and higher education" (in which the knowledge society is seen as a process involving a catalytic elite, as in the US, Brazil, China and, to some extent, the EU); and another that sees a new more inclusive people-oriented society, in which knowledge and innovation serve the needs of all citizens and should have a concrete and beneficial impact on daily life (as in India and, to a lesser degree, Japan, as apparent in the guidelines of the Innovation 25 process). Finally, there are diverging governance models in terms of the depth of change in regulatory regimes and of the commitment to global governance, as well as in terms of vertical coordination between different levels of government and the recognition of the role of sub-national governments and knowledge regions. There are more centralist orientations in Japan and China, where the emphasis tends to be on horizontal coordination, and a more decentralized orientation with an emphasis on regional sub-national governments in India and the US, which try to combine horizontal and vertical coordination. The EU and Brazil occupy an intermediate position but are closer to the centralist conception.

Knowledge Regions and Implications for the New Foreign Policy

Knowledge regions are increasingly perceived not only as the front runners in terms of the transition to the knowledge society, given their strategic role in the creation of tacit knowledge but also as the real competitors in the global economy. The con-

cept of knowledge regions is relatively recent and there is as yet no consensus about its precise contours. Clearly, however, the term refers to micro-regions, territorial units that are part of a state, which operate as regional innovation systems according to the logic of the knowledge economy and society. Although the focus has been more on sub-national knowledge regions, trans-border regions involving different states and cutting across political boundaries can also constitute knowledge regions. In spite of the fluidity of the concept, comparative analysis suggests that knowledge regions display some common features that far transcend economic aspects and include sociological, governance and political dimensions. The most fundamental features include the following:[1] first, a high level of human capital as a result of consistent levels of investment, especially in education and training, with important consequences not only in terms of productivity but also in terms of acquisition of new skills, innovation capacity and learning capabilities. Second, high public and private investment in R&D, and efficiency of the system translated into good performance as far as outputs are concerned, particularly patents. Third, the existence of a core group of knowledge-intensive industries and/or knowledge services, which play a strategic role in securing innovation and competitiveness, notably: IT and computer manufacturing (computer and office equipment, electronic components, and communication equipment), biotechnology and chemical sectors (pharmaceuticals, drugs, and chemical products), automotive and high-technology mechanical engineering (motor vehicles and transport equipment, machine tools and equipment); instrumentation and electrical machinery (precision and optical equipment, electrical transmission equipment, and lighting and wiring equipment); and high-technology services (software and computer related services, telecommunications, research, consultancy, and development and testing service). Fourth, a high level of social capital, with concomitant good standards of cooperation and trust between members of the community, which favours the development of dense regional networks between regional knowledge actors, enhancing the capacity to produce and diffuse tacit knowledge. Fifth, the existence of communities characterised by strong multicultural traits, as-

[1] See Miguel Santos Neves (2006).

sociated with the presence of a significant foreign community from a variety of countries and cultures, as dynamic innovation poles attract talent from other countries and regions, which facilitates familiarity with other cultures and visions of the world. Sixth, the presence of new, less hierarchical and more participatory forms of governance, which emphasise active public-private partnerships, devolution of powers to local governments, new forms of articulating different levels of government, and policies to facilitate public and private entrepreneurship. Seventh and finally, the existence of a high international profile, in many cases associated with a reasonable level of international participation based on proactive paradiplomacy in areas of *low politics* carried out by sub-national governments in close co-ordination with the private sector and civil society organisations.

The Emergence of Knowledge Regions

These traits illustrate the complex, multidimensional and far-reaching structural changes that underpin the emergence of knowledge regions. It should be noted that they are tendencies and are therefore combined differently in different regions. Various factors account for the new strategic relevance of knowledge regions. First, there is the necessity to introduce new forms of governance within states, which led to decentralisation and devolution of powers to sub-national governments. The systemic effects of globalisation are weakening the Westphalian state, although with considerable differences between strong and weak states, as a result of the incapacity of central bureaucracies to deal effectively with a whole new range of complex issues, the growing power of non-state actors, and the emergence of new sources of loyalty and identity that compete with national identities. Globalisation is also pushing forward a new concept of sovereignty, limited by fundamental international norms of *jus cogens*, which puts greater emphasis on the duties of states with regard to the protection of the rights of its own citizens and human security, and less on the rights of states. Further, knowledge regions have emerged as the systemic medi-

Knowledge regions have emerged as the systemic mediators between the local and the global, managing contradictions and addressing new multi-level governance challenges.

ators between the local and the global, managing contradictions and addressing new multi-level governance challenges. To a large extent they are the real competitors in the global economy and so have acquired a deep understanding about its logic and dynamics. One can argue that it is regions rather than countries that are competing in the global economy. Conversely, at the local level they function both as the catalysts to organise local actors' strategies and actions to pursue their interests in the global economy, and as the safety net to cushion the negative effects of globalization, thus contributing to social stability. Finally, the relevance of knowledge regions is a function of their strategic role in strengthening global governance insofar as they already operate on the basis of multi-actor knowledge networks whose expertise is required to respond to the complex regulation of very technical issues. This puts them in a privileged position to provide inputs for global rule-making. Similarly, they have a crucial role to play as far as rule-implementation and adaptation to local conditions and specificities are concerned. They are therefore strategic players in ensuring both voluntary compliance with and enforcement of global rules. In sum, knowledge regions are simultaneously at the intersection between the global and the local and between globalization and the knowledge economy/society.

Robert Huggins has undertaken a comparative analysis of knowledge regions, and has produced the World Knowledge Competitiveness Index for the last four years.[1] The latter is an overall benchmark of the knowledge capacity, capability and sustainability of 125 regions in North America (55), Europe (45), and Asia and Oceania (25), which are considered the best performing and most dynamic regions in the global economy. The analysis is based on 19 knowledge economy benchmarks,[2] including indicators such as R&D investment, patent registration, education expenditure, ICT infrastructure, and employment levels in the knowledge economy, among other factors. This composite index constitutes a significant effort to capture a complex phenomenon,

[1] Robert Huggins and Associates (2006).

[2] The knowledge-based economy is defined as "the capacity and capability to create and innovate new ideas, thoughts, processes and products and to translate these into economic value and wealth." It seeks to analyse how far knowledge is translated into economic value and wealth of citizens of each region.

but it is still being consolidated and continuously improved. So, it comes as no surprise that, despite its potential, the Index presents some limitations, notably because it focuses on the economic/competitiveness pillar. There are therefore two particular dimensions missing that should be addressed: social capital (the set of norms and values that determine the capacity of the members of a community to cooperate and create trust to achieve common goals – although one must concede that it is not easy to find a suitable indicator to assess this variable), and the level of proactive international activity (or the extent to which the region is active in the international arena, in particular the density of relations and agreements with other knowledge regions, since regions are not closed systems). The 2005 World Knowledge Competitiveness provides an interesting analysis of the performance of the leading knowledge regions. It shows the US knowledge regions (led by the San José region) are clearly in the lead as the best global performers and most competitive (the US accounted for 9 out of the 10 top positions, with Stockholm being the only exception; and even more impressively, 42 out of the 50 top regions. There are only 8 non-US regions in the top 50: 7 European (4 Nordic, 1 French, 1 Belgian, 1 Dutch), and 1 Asian (Tokyo)). The first conclusion is that both EU and Asian knowledge regions are lagging behind the US and the gap is not closing. Indeed, it might even widen in the coming years if European and Asian regions are not able to address their weak points. Three other factors explain the performance of US regions: high and continued investment in education; high government and business spending on R&D, associated with higher levels of patent registration; and good ICT infrastructure. The quality of higher education is also strategic as it attracts talent, which in turn strengthens the R&D system. Also important are proactive state government policies in innovation and strong public-private partnerships. By contrast, European and Asian regions perform better in terms of employment levels in knowledge sectors (Asia stronger in IT and computers, Europe stronger in the automotive sector) but lag behind the US regions in terms of the other key indicators.

Paradiplomacy and Foreign Policy in the Knowledge Era

A crucial issue in terms of prospective analysis is the implications of the new knowledge society paradigm for structural changes in

foreign policy, taking the emergence of knowledge regions into account. There are interesting developments which suggest potential fundamental changes to the goals, nature and instruments of a foreign policy in a global knowledge society. The first development is the new relevance of paradiplomacy developed by sub-national governments, in particular by the governments of knowledge regions. These are increasingly active in the international arena, mainly in areas of low politics (trade, investment, science and technology, culture, and education), trying to project their specific interests according to a dual logic: on the one hand, a process "from the inside out" reflecting the fact that local governments go out to promote local interests and reduce the risks of international threats; on the other, a process "from the outside in" whereby non-central governments become the focus of attention and suffer pressures from both foreign governments and non-state actors as they realise that influence at the central level is no longer sufficient to pursue their aims. This is a potential area of conflict with the traditional diplomacy of central governments.

The "chaos scenario," heavily influenced by the state-centric view, considers paradiplomacy a dangerous derogation of state power and a clear threat to the coherence and unity of foreign policy: sub-national actors are regarded as trespassers and their behaviour as deviant. However, there is also a more positive view, supported by authors like Hocking, who envisages the international involvement of knowledge regions as an important development that contributes to promote the democratisation of foreign policy and greater citizen participation in areas which have an increasingly important impact on their daily lives. This change reflects the expansion of foreign policy to include what is termed "private foreign policy," developed by non-state actors, and the emergence of a new phenomenon of multilayered diplomacy.[1] Moreover, the holistic approach inherent in the global knowledge society also implies that the boundaries between domestic and foreign dimensions on the one hand, and "high politics" and "low politics" on the other, became increasingly blurred, which implies the need to achieve not only greater policy coherence between

[1] On paradiplomacy see Brain Hocking (1993). Duchacek uses the concept of paradiplomacy in "Perforated Sovereignties," *in* Michelmann and P. Soldatos (1990): 15-27.

domestic and foreign policies but also between the three main axis of external action which involve the triangle diplomacy-co-operation-business. The case of energy is an excellent example of this new process.

The third implication is that the new paradigm requires a new strategic public-private partnership for external action to replace the traditional foreign policy monopoly of governments. Knowledge networks involving coordination and cooperation between governments, business, NGOs, academia, trade unions becomes paramount for effective external action not only in terms of implementation but also in terms of policy conception. Furthermore, these networks do not only affect external action as they operate simultaneously "inward" and "outward," such that external activities are the natural extension of domestic cooperation. The flow of knowledge and the circulation of human resources from public to private institutions and vice-versa is a strategic dimension that is part of this new partnership.[1] Fourth, there will be a tendency to enhance the relevance of the informal dimensions and instruments in foreign affairs, namely the role of diasporas and immigrant communities, in particular overseas business communities, best illustrated by the role played by Chinese communities in terms of facilitating economic flows, and providing economic intelligence and knowledge about cultural codes and norms. Fifth, there is also a tendency for new priority issues to emerge in foreign policy agendas, and the valorisation of soft power dimensions, particularly with issues such as migration and flows of human capital, a key asset in the new society, with increasing competition to attract talents, understand culture, social norms and minorities, address the environment, and promote science and technology. Finally, there is a new vision about (and mounting pressure for) advances in global governance, which is no longer solely concerned with the mitigation of the negative impact of globalisation but also addresses at least three other goals: new challenges arising from the issues raised by the technological revolution such as human genetic engineering, robotics or nanotechnologies; delivering global public goods such as peace and stability, security, equity, fair competition, and environmental sustainability; and ensuring greater freedom to choose,

[1] See the first chapter by Miguel Neves *in* Fernando Jorge Cardoso , ed. (2007)

the essence of development, as Sen puts it.[1] In this respect it is relevant to highlight the new role of global transnational networks in international rule-creation, and renewed concern with global rule-implementation, which requires the active involvement of sub-national actors and knowledge regions insofar as they can adapt global rules to local specificities.

Conclusions

The transition to the knowledge society/economy has become a key issue in the strategic thinking of many societies and states and is gradually becoming a priority in the political agenda of governments. Thus far, this trend involves mainly "strong states," developed countries or emerging new powers, which already have a strong position in the global economy. The analysis of the EU, Japan, the US, Brazil, China and India shows that, since the late 1990s, these actors have engaged in the formulation and implementation of strategies to facilitate a transition to a knowledge society or economy. The comparative analysis of these strategies allow us to conclude that there are many fundamental points of convergence insofar as they all adopt a long term perspective and a multidimensional and integrated approach which tend to combine three fundamental pillars, economic, social and environmental, although in different proportions and with different levels of fusion. Moreover, there is also a clear convergence as far as the identification of the priority sectors and sectoral policy guidelines are concerned, and the need to promote new forms of governance that can facilitate horizontal coordination between these policy areas. Interestingly enough all tend to see this process as essentially domestic with little coordination and linkages with foreign policy and little interaction with the international system. One possible interpretation is that the knowledge society strategy, which governments believe they can control, is to some extent regarded as a structured response to the challenges and irresistible forces of globalization that states do not control. This assumes the existence of two separate logics, with the external dimension and foreign policy basically associated

[1] Amartya Sen (1999 and 2002).

with the logic of globalization. This paper questions this assumption insofar as it argues that globalization and the knowledge society are intertwined processes, partially complementary and partially conflictive, that converge in a complex process of glocalization.

However, there are also important divergences in three fundamental areas. First, in terms of the exploration of the synergies between the economic, social and environmental pillars, with a contrast between those adopting a balanced approach and those attaching different levels of importance to each pillar, as well as between the strategies that fully recognize the relevance of social factors and policies to enhance economic performance and competitiveness and those that still emphasise the trade-off. Second, in terms of the governance model required, which reflects the variations in existing governance cultures, with repercussions in terms of implementation of strategies, with some adopting a more centralist model and others a decentralized one which allows more space for the active participation of sub-national regional and local governments as well as civil society sectors. Third, and probably the most significant point of divergence, is the ultimate rationale of the knowledge society. A fundamental division emerges between an elitist conception that restricts the knowledge society to the triangle "R&D system-higher education-innovation" emphasising the strategic role of a "modernizing elite," and a people-oriented knowledge society that is more inclusive, where knowledge and innovation primarily serve the needs of all citizens and seek to benefit the daily lives of all. This is clearly a fundamental question insofar as the direction adopted will determine whether the knowledge society contributes to reduce inequalities counterbalancing the negative impact of globalization, or adds to the problem and reinforces growing asymmetries.

Given the relevance of this paradigm shift and the similarities identified, these processes would benefit greatly from structured exchanges and joint reflection and analysis to promote mutual learning and benchmarking in order to disseminate best practices. Although there are already signs of some degree of interaction such as the influence of the Lisbon Strategy on Brazil but also on China, and more recently and to a lesser degree on the Japanese Innovation 25 Plan, these have been only sporadic and ad hoc exchanges thus far. Moreover, the implementation of these strate-

gies can also benefit from an intensification and renovation of international cooperation, in particular in areas that are strategic for the knowledge society. This cooperation is also of the utmost importance for countries still excluded from such a process so as to promote a true internationalisation of the knowledge society. However, one can argue that this will not occur through traditional state-to-state cooperation but will increasingly involve multi-actor knowledge networks. Knowledge regions became crucial players in the process of transition to the knowledge society, as a result of the very nature of the process of creation and diffusion of tacit knowledge and the density of knowledge networks. They emerge as key mediators between the local and the global and can make, given their paradiplomacy experience, a relevant contribution to international dialogue and cooperation.

Finally, the successful transition towards the knowledge society also requires changes in global governance to create adequate global regulations, in particular to remove obstacles to the diffusion of knowledge, and to ensure efficient management of multilevel rules and overlapping jurisdictions. National governments tend to have a monopoly on this process with little involvement of sub-national actors, although knowledge regions have a key role to play both in terms of rule-creation and rule-implementation which has not been fully acknowledged. Addressing this fundamental challenge requires structural changes in the nature and practice of foreign policy, including paradiplomacy, which will be critical not only for the consolidation of the knowledge society/economy paradigm within states but also for its international diffusion so as to ensure a more equitable international system.

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