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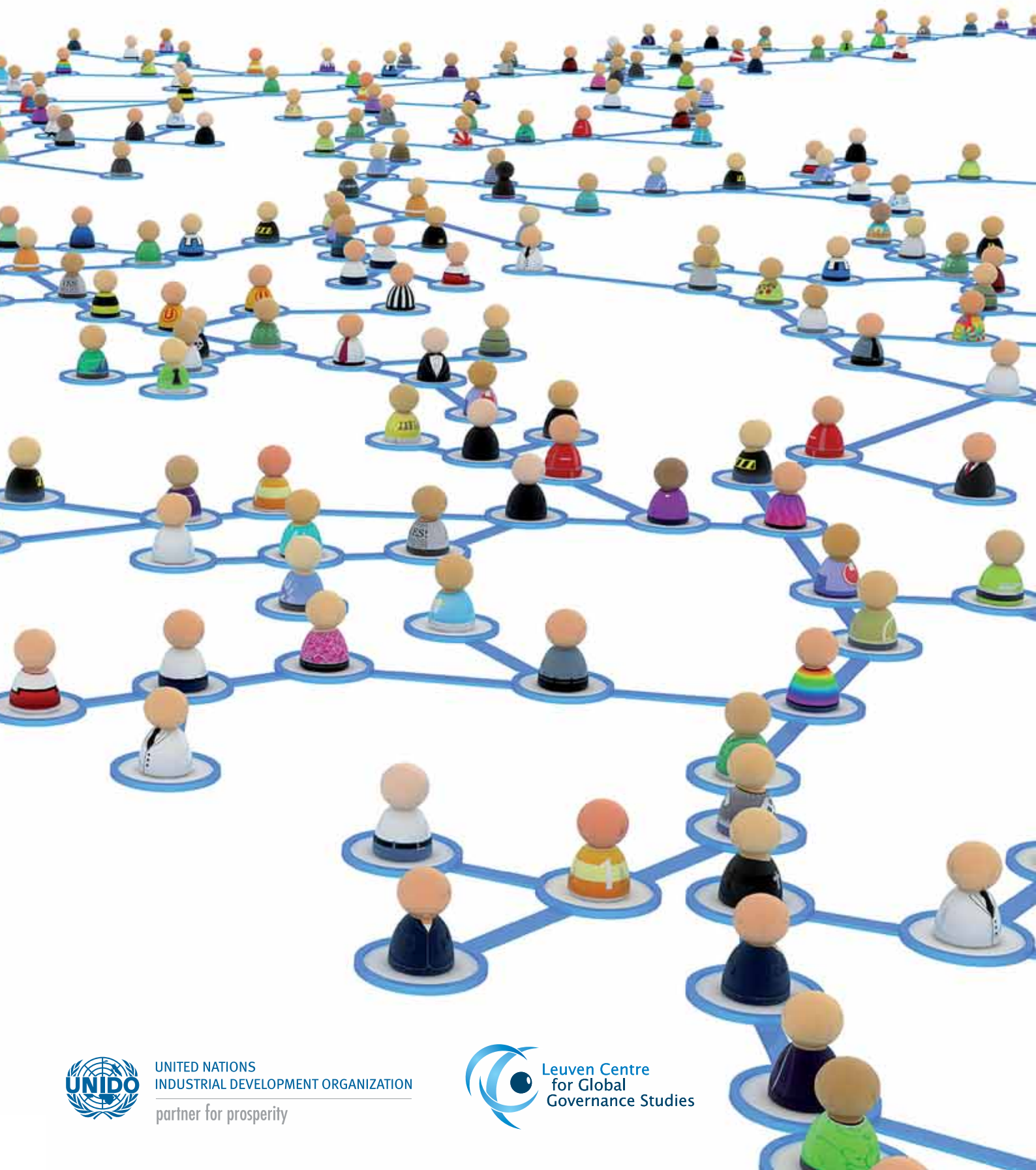
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Networks for Prosperity
Connecting Development Knowledge Beyond 2015

Networks for Prosperity

Connecting Development Knowledge Beyond 2015

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Acronyms

ADC	Austrian Development Cooperation
ANPROTEC	National Association of Promotion Companies for Innovative Enterprises
BRICS	Brazil, Russia, India, China and South Africa
CIP	Competitive Industrial Performance
COMTRADE	Commodity Trade Database
CSO	Civil Society Organization
DCED	Donor Committee for Enterprise Development
DG	Directorate General (of the European Union)
ERI	Enabling Rural Innovation
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
IEA	International Energy Agency
IEC	Inter-ministerial Economic Conferences
ILO	International Labour Organization
IMF	International Monetary Fund
IOM	The International Organization for Migration
IRENA	International Renewable Energy Agency
ISO	International Organization for Standardization
IT	Information Technology
ITU	International Telecommunication Union
KM	Knowledge Management
KN	Knowledge Networks
KOF	Konjunkturforschungsstelle der ETH Zurich (Swiss Economic Institute)
MDGs	Millennium Development Goals
NGO	Non Governmental Organization
NGDO	Non Governmental Development Organization
NIH	Not Invented Here
ODA	Official Development Assistance
OECD	Organization for Economic Co-operation and Development

OEM	Original Equipment Manufacturer
OVI	Objectively Verifiable Indicators
PCM	Project Cycle Management
PPP	Purchasing Power Parity
R&D	Research and Development
SDGs	Sustainable Development Goals
SEBRAE	Brazilian Service for the Support of MSMEs
SMEs	Small and Medium Enterprises
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNIDO	United Nations Industrial Development Organization
WIPO	World Intellectual Property Organization
WTO	World Trade Organization

Foreword

Jesús Gracia Aldaz
Secretary of State for International Cooperation and for Latin America of Spain

The Millennium Development Goals Achievement Fund (MDG Fund) is a Spanish initiative created to accelerate progress on the achievement of the MDGs, by supporting high-impact innovative actions in selected countries and sectors, actions that could be wide replicated.

Another key objective of the Fund has been to promote the cooperative inter-agency work within the UN System. In fact, all MDG-F-financed programs build on the collective strength of the UN, bringing several Agencies together to address issues that cut across the mandate of individual organizations. The MDG-F is thus contributing to the UN Reform process, in particular to the UN efforts to deliver as one.

With the resources assigned to this Fund (a total of 618 million Euros) Spain has supported more than 130 joint programs in fifty countries from five regions around the world. Over twenty UN Agencies have been involved in the formulation and implementation of MDG Fund joint programs, with an average of six Agencies participating in each programme.

In 2010 the MDG Fund requested UNIDO to create a knowledge management concept that would help developing countries to adapt private sector development knowledge to their specific contexts and needs, and, at the same time, enhance the knowledge capabilities of the United Nations system and its national counterparts and partners in the field of Private Sector Development policy. As a result, the *Networks for Prosperity* initiative was born within the context of the project "Establishing a Global Knowledge System for Private Sector Development (PSD) Policy".

In this context, a first report *Networks for Prosperity: Achieving Development Goals through Knowledge Sharing* was published in November 2011, and has received an overwhelmingly positive response. This is not surprising. Policy-makers increasingly recognize

the potential of networking and cooperation as essential tools to create jobs through economic growth and prosperity. From a historical perspective, this field has been severely underestimated and under-researched but recent academic research shows its relevance and direct impact in economic development.

This is why Spain is proud and honoured to be part of this second report and cherishes UNIDO for its continued work in this field. The *Networks for Prosperity* initiative has been supported by Spain since its beginning, and we value all the related achievements and activities developed under this programme by UNIDO. We especially welcome the focus on Latin America and the Caribbean in this first phase of the initiative and I truly believe that UNIDO's catalytic work and expertise are ideal for matching the economic development priorities of the countries from this geographic region.

The MDG Fund represents the Spanish commitment to multilateral cooperation for development, and acknowledges the extraordinary effort made by Spain in this regard. This expertise-based partnership of UNIDO with the MDG Fund has made a tremendous contribution to the impact and visibility of the Fund efforts, both globally and in its country programs. We are therefore looking forward to the continuation of the fruitful collaboration and partnership with UNIDO in this field of economic governance and knowledge networking.

Jesús Gracia Aldaz
Secretary of State for International Cooperation and for Latin America of Spain

Foreword

Kandeh K. Yumkella
Director-General, UNIDO

The first Networks for Prosperity report was launched in November 2011 at a time of great economic uncertainty, great inequity, high urbanization, financial constraints and high youth unemployment.

It was intended to build on the existing literature by examining types of knowledge networks and exploring their relationship with private sector development and economic growth. It was a genuine and original academic exercise which reflected the critical role of knowledge networks as one of the driving, though invisible, forces of economic growth.

The first report highlighted in its recommendations that countries could significantly benefit from ensuring that their local and international networks are successfully embedded. Vibrant knowledge networks require a living ecology of institutions, which perpetually provide new knowledge and opportunities, and which continuously enhance socio-economic and private sector development policymaking abilities at the national and international levels. Globalization means that world economies cannot grow in isolation, and in this context of interrelations and connectedness higher economic growth stems from regional and international integration. If this integration is to be successful, it is necessary to create a strong infrastructural base, and to diffuse the transfer of knowledge, skills, information, technology, innovation and investments with the objective of achieving a major goal: sustainable growth and prosperity.

One year on, the global community seems ready to embrace new forms of partnership in the pursuit of sustainable development. The High-level Forum on Aid Effectiveness held in Busan in November 2011 has set the scene for new modalities of development assistance that go beyond traditional concepts of donor and recipient, to incorporate more complex networks of South-South, triangular and public-private cooperation. Efforts towards agreeing to a new set of global development goals beyond 2015 are also looking to unleash the power of new development actors through networks. It has for some time been an important feature of the global economic environment that industrial production has become segmented into different stages across different countries. Many of these countries are located in the South. Emerging or transition economies are increasingly broadening and deepening their range of knowledge and expertise to a point where traditional development actors will need to re-define their role towards acting as a connector and catalyst, facilitating countries on their paths to greater independence and international leadership.

This second Networks for Prosperity report collects all these interests from a rich diversity of sources and goes one step further by analyzing knowledge networks and network governance in practice, including some factors that allow some to be more successful than others. An updated version of the Connectedness Index covering more countries, together with a comparative analysis of all international networking indices and additional case studies introduced, provides a closer and more detailed approach to networks, reflecting its influence and impact on global policymaking and development cooperation. Reflective essays by leading experts point to key issues to be tackled in the near future with regard to knowledge networks. The report was prepared on behalf of the United Nations system by UNIDO's Networks for Prosperity initiative in close collaboration with the University of Leuven. The Networks for Prosperity initiative was generously supported by the Government of Spain through the Development and the Private Sector thematic window of the Millennium Development Goals Achievement Fund. I am convinced that this report will prove to be a useful tool for policymakers, professionals and experts in the achievement of sustainable development and economic growth.

Kandeh K. Yumkella
Director-General, UNIDO

Foreword

Sophie de Caen
Director, MDG Achievement Fund

As part of a larger knowledge management initiative for private sector development programming, the MDG Achievement Fund has proudly supported the Networks for Prosperity initiative since its inception. The second report of the Networks for Prosperity initiative provides the reader a clear and insightful picture on the critical role that knowledge networks play in a new global aid architecture.

Remarkable academics and practitioners have collaborated in the elaboration of this report by providing new and innovative essays covering different aspects of networks, from regulatory networks to business networks or the analysis of barriers to learning.

The Connectedness Index presented in this report shows the correlation between a high degree of regional and global integration with economic improvement. Knowledge networks have an impact in economic growth, so policymakers and practitioners will find this report particularly useful as it shows the internal workings of knowledge networks, how they are created, what factors are going to play a decisive role in the successful end of a network. Country case studies show networks in action, particularly through the creation and promotion of knowledge platforms aimed at the achievement of sustainable economic growth.

We are convinced that the achievements and results presented in this report will have a strong impact in the overall field of sustainable development, the debate about the post-2015 agenda, and the growing relevance of South-South cooperation.

Sophie de Caen
Director, MDG Achievement Fund

Foreword

Jan Wouters
Director, Leuven Centre for Global
Governance Studies

In the face of evolving global challenges and shifting notions of development, the strategies which developing countries devise in order to achieve economic growth and stability must also adapt. Industrial development is no longer the monopoly of large hierarchically organized institutions.

Networks and knowledge networks are becoming increasingly important to support industrial development in line with the Millennium Development Goals. The present second Networks for Prosperity report, building on the foundational first report, taps the knowledge of academics and practitioners alike to demonstrate how networks and network governance can help states in applying sound and profitable industrial development strategies. By disseminating information, encouraging learning, and diffusing management practices, networks spark and support private sector development.

This report aims to expand the understanding of how networks function in theory and in practice. Doing so exposes the ways in which networks can disseminate information capable of influencing development practices. The research centres on UNIDO's recognition of networks as major contributors to private sector development. Bearing this in mind, the report acknowledges networks as an emerging governance structure, and it recognizes that there is both a profound lack of scientific research on this phenomenon and significant potential for such research to bolster developing countries' capacity to more effectively utilize networks to reach development goals.

The contributions to this report span across academic disciplines, indicating that networks and network governance offer significant opportunities for private sector development. Delving deeper into the concepts first elaborated in the 2011 report, they look into various ways to measure the links between states, the role networks play in various societal settings, and the

degree to which organizations, firms, and people influence knowledge flows across and between networks. A series of case studies expose networks in action, drawing lessons from the experience of states, NGOs, and sectors.

The findings and results reflect coordinated action and discourse between academics and practitioners fermented under the framework of the UNIDO-Leuven Centre for Global Governance Studies Expert Group Meeting on Knowledge Networks. The insights on networks, knowledge management, and network governance stem from studies prepared and discussed in this forum, and embody the multidisciplinary research approach honed at the Expert Group meeting. The report submits not only that networks constitute an innovative tool for developing countries to pursue private sector development, but also that they are a potent instrument with vast potential to impact sectors, domestic industrial development, and international cooperation to achieve the Millennium Development Goals. As we continue to investigate the magnitude of a network's effect on industrial development, the information and experiences detailed here can help challenge and rethink current notions of development, reestablishing industrialization as a key force to achieve sustainable economic development.

Prof. Dr. Jan Wouters
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Executive summary
Introduction

This study is the second report prepared by UNIDO's Networks for Prosperity initiative. The initiative was born under the funding window "Development and the Private Sector" of the Spanish MDG Achievement Fund (MDG-F). In 2010, UNIDO, as the technical convenor agency of this thematic window, was requested by the MDG-Fund Secretariat to establish a knowledge management concept that would support developing countries in acquiring and adapting private sector development (PSD)-relevant knowledge to their specific contexts and development needs, and enhance the knowledge capabilities of the United Nations system and its national counterparts and partners in the field of PSD policy.

The first report, titled *Networks for Prosperity: achieving development goals through knowledge sharing* was launched in November 2011, as a global study inspired by initial discussions on the issue of knowledge management and networking in development cooperation that took place during a global workshop among MDG-F programme coordinators in March 2011 in Panama City. This workshop was the starting point in developing a concept of the role that knowledge networks and knowledge sharing can play in private sector development policy at local, regional and global level. The meeting also inspired a first round of consultations on knowledge networks as an essential tool for policymakers to achieve economic and other development goals.

This first report was launched in Vienna, Brussels, New York, San José and Washington D.C. between November 2011 and April 2012 and served as a basis for policy considerations related to development strategy, effectiveness and governance, and led inter alia to UNIDO General Conference resolution GC.13/Res.2 *"Knowledge networking and knowledge sharing for achieving development goals"*.

Knowledge networking and knowledge sharing for achieving development goals

The General Conference,

Recalling resolution GC.13/Res.6 on the crucial role of the productive sectors in supporting the achievement of the Millennium Development Goals,

Recalling also decision IDB.38/Dec.8 on UNIDO activities in the field of industrial policy, and in particular paragraph (g) (ii) of that same decision requesting the Director-General to support the exchange of knowledge, experiences and best practices among experts and policymakers at the global and regional level,

Recalling further decision IDB.36/Dec.13 on United Nations system-wide coherence: UNIDO's role, and in particular paragraph (d) of that same decision stressing the essential contribution of industrial development in achieving the Millennium Development Goals,

Stressing the key role of the productive sectors in reducing poverty and supporting sustainable development, and thus in the achievement of internationally agreed development goals, including the Millennium Development Goals,

Underlining the importance of international knowledge networking and the exchange of experiences and best practice for the achievement of local, regional and international development goals and prosperity,

Welcoming the role of UNIDO as convenor agency for the eighth funding window of the Spanish MDG Achievement Fund (MDG-F) on "Development and the Private Sector" and, within this context, its active coordination role in the first global meeting of Joint Programme Coordinators in Panama City from 1 to 3 March 2011 and the resulting Panama Plan of Action,

Taking note of the global report "Networks for Prosperity: Achieving Development Goals through Knowledge Sharing", launched on 14 November 2011, and in particular the newly-introduced Connectedness Index and the recommendations in the same report,

1. *Requests* the Director-General to continue to develop and foster, within the Organization's mandate and within existing resources, activities that:
   (a) Promote international knowledge networking and knowledge governance structures for achieving local, regional and global development objectives;
   (b) Encourage and facilitate the international knowledge networking capacities of public and private institutions in developing countries;
   (c) Improve the inter-institutional information and knowledge exchange systems of UNIDO in the wider United Nations context;
   (d) Support the establishment of international and cross-sectoral consultation networks to further develop the initial findings on knowledge networking and connectedness and to expand the geographic coverage of the Connectedness Index;

2. Encourages the Secretariat to strengthen its efforts to mobilize funds for the implementation of the above-mentioned activities;

3. Invites development partners to enhance their financial support to the Organization for the implementation of the present resolution;

4. Requests the Director-General to submit a report on the progress made in implementing the present resolution to the Industrial Development Board at its fortieth session.

Box 1.1: UNIDO General Conference Resolution GC.14/Res.2

Inspired by the success of the first report, this second report Networks for Prosperity: connecting development knowledge beyond 2015 was prepared with the aim of building on the initial findings. It intends to provide a more in-depth account and insights into the internal functioning of knowledge networks and knowledge platforms, and to define the critical factors that influence the creation and successful development of a knowledge network. For this purpose, some twenty academic and practical experts from around the world were selected as contributors after a global call for proposals and an experts group meeting that took place in September 2012 in Vienna (see box 1).

Box 1.2: Expert group meeting and its findings

On September 26th 2012, an Expert Group Meeting on Knowledge Networking and Network Governance took place in Vienna, co-organized by UNIDO and the Leuven Centre for Global Governance Studies. Participants included representatives from the European University Institute (EUI), the University of Belgrade, the non-governmental organization KNOWHOW3000, the Leuven Centre for Global Governance Studies, the Institute for International and European Policy of the University of Leuven, UNIDO, the University of California San Diego, the University of Padua, the University of Georgia School of Law, the University of Coimbra, the Institute for Economic Research on Innovation (IERI) of the Tshwane University of Technology, the International Institute of Social Studies of the Erasmus University of Rotterdam, the ALTERA Research Group of the Wageningen University and ESADE Business School.

The meeting was organized with the overarching goal of peer-reviewing the latest academic insights on knowledge management and knowledge networking. Papers were presented around three themes: (i) the conceptualization, design, management and measurement of networks; (ii) knowledge diffusion through networks; and (iii) transferring knowledge from networks to users. After the day of discussions on networks and knowledge management, the group itself inadvertently formed a network of researchers and practitioners in the field of knowledge networking in the public sector. A selected number of papers were selected to form the conceptual and academic basis of this second Networks for Prosperity report.

This report is divided into five parts:

○ *Part 1* sheds light on the changes in the development landscape over the past two decades – from the global development conferences to the MDGs and beyond – and discusses the newly emerging development architecture and potential scenarios for a post-MDG world. It also links these broad developments to the increased relevance of South-South and triangular development cooperation, thus demonstrating the connection between this rise of "the South" and knowledge networks and network governance.

○ *Part 2* presents an empirical analysis of knowledge networks and international connectedness, and their relevance to development effectiveness and economic development. A new, updated, version of global Connectedness Index is introduced for 132 countries, along with an analysis on correlations between a country's connectedness and its economic success factors. This part also includes a network-based empirical analysis on economic globalization.

○ *Part 3* shows how knowledge networks actually work in the real world. From the Costa Rican case of the establishment of a competitiveness council to the networked system of business development services in Brazil and the global knowledge-networking concept of an Austrian NGO, the reader is invited to explore recent case studies that show knowledge networking and network governance in real life. In addition, this chapter illustrates the utilization of knowledge networking in the field of trade policy, comparing several trade administrations.

○ *Part 4* explores how and to what degree knowledge networks differ and provides several think pieces on knowledge networks and epistemic cooperation in the respective environments of regulatory agencies, business and international organizations, such as UNIDO and IRENA. An additional chapter calls for the free movement of knowledge as a principal factor for targeted human capital development, an essential prerequisite for any knowledge economy.

○ *Part 5* provides conclusions on the aforementioned items and formulates some recommendations that Member States may wish to consider in their deliberations on the report.

Part 1:
Towards a New Era of Networked Development

Part 1 traces the emergence of an embryonic network-based approach to the global development agenda. It charts the experience of elaborating the Millennium Development Goals (MDGs) in the 1990s, largely a result of distilling existing knowledge towards specific aims, before examining efforts in the 2000s to encourage greater participation by non-traditional development actors. In this connection, it also explores the parallel rise of South-South and triangular cooperation as well as moves by the development community to expand the global partnership for development to include more complex forms of cooperation. It goes on to examine what appears to be the beginning of a new agenda beyond the projected expiration of the MDGs in 2015, one which is likely to place greater emphasis on building and accessing knowledge in a more decentralized and dynamic way than before. Finally, it concludes by providing suggestions to developing countries on matters to consider concerning their own roles in the emerging development architecture.

1. KNOWLEDGE FUNNELLING: THE CASE OF THE MILLENNIUM DEVELOPMENT GOALS

The establishment of the MDGs as the over-arching framework for global development efforts is frequently recalled as a key outcome of the adoption of the Millennium Declaration by the General Assembly in 2000, a process in which every United Nations Member State had the opportunity to play an equal part. The Millennium Declaration could therefore be regarded as the conclusion to the ultimate participatory process – the coming together of all nations to agree a common position on how to achieve a better future for mankind. The Declaration itself had its origin in a wide range of international development publications, initiatives and conferences spanning many decades but particularly gathering steam in the early- to mid- 1990s. The publication by the United Nations Development Programme (UNDP) of its first Human Development Report in 1990 began a rapid shift away from an emphasis in development discourse on economic growth and infrastructure development towards one which saw development as a means to enrich human life and to enlarge the individual's choices. A number of mainly UN-led global conferences in the following years highlighted the need to invest in social needs such as access to nutrition, education and health services, as well as links between development and the environment, human rights, population, and gender (see Manning, 2009).

By 1995 the breadth of information on global development issues had possibly never been greater, but there was a growing feeling in some quarters that this information needed to be better analysed to arrive at areas of prioritization. The OECD's Development Assistance Committee (DAC) took it upon itself to review the future of development aid and the role of the DAC within this. One of its tasks was to examine declarations made at some of the recent UN conferences and to extract a set of

actionable principles. This led to the publication in 1996 of a paper entitled "Shaping the 21st Century: the Contribution of Development Cooperation", which included a short set of proposed "International Development Goals" (IDGs), largely drawn from UN summit declarations but including rudimentary targets and indicators. The period from 1996 to 2000 saw increasing engagement and policy coordination in favour of the IDGs from a smaller group of DAC donors (mainly the "Utstein Group" of the United Kingdom, Germany, Norway and the Netherlands).

Meanwhile the Secretary-General of the United Nations began the process of preparing the Millennium Declaration, which would also contain a set of goals. Adoption of the Declaration by the General Assembly would give unimpugnable inter-governmental authority to these proposed 'Millennium Goals'. Discussions between Member States on the text eventually led to a long list of goals covering peace, security and disarmament; development and poverty eradication; the environment; human rights, democracy and good governance; protecting the vulnerable; meeting the special needs of Africa; and strengthening the United Nations. The goals went far beyond the DAC/Utstein Group's proposal for prioritized, concrete, monitorable, achievable IDGs.

Following the Millennium Summit, discussions on how to bring the development agenda forward moved to an informal group of like-minded entities, spearheaded by members of the Utstein Group together with the DAC secretariat, individuals from some UN entities, and the Secretary-General's office. This group tasked itself with agreeing a set of goals that would highlight a limited number of commitments in the Millennium Declaration that could be quantified, and for which there were established indicators for which reasonable data existed. The result of this exercise was a framework containing 8 goals, 18 targets, and 48 indicators, which was annexed to a road map on follow-up to the Millennium Summit released by the Secretary-

General in 2001. This list became the authoritative statement of the MDG framework despite the fact that it had not been agreed in the General Assembly or on a truly multilateral basis. In essence, the MDGs had been 'funneled' into existence by a small, informal, but highly influential network. The Goals went on to receive informal endorsement at the UN Conference on International Financing for Development in Monterrey in 2002, and it was there that funding commitments started to be made on the basis of the MDGs.

Against this backdrop, the rapid acceptance of the MDGs as a set of goals shared by all is an interesting phenomenon. The clear consensus that emerged around the framework was one of its greatest strengths, and certainly helped to mobilize resources for development. However the lack of a more inclusive consultation process also arguably led to gaps in knowledge that weakened the scope of the MDGs, and their targets and indicators, from the beginning. For example, a large range of important issues were either ignored or inadequately addressed – including productive employment (and economic aims generally), peace and security, governance and the rule of law. There was also a general lack of understanding at the outset that achieving MDGs at the country level required extensive adaptation to given country contexts – tapping into local knowledge and, above all, keeping those closest to this knowledge in the driving seat.

Ironically, perhaps, one of the MDGs did point the way towards a more broad-based approach. MDG 8, the goal to develop a global partnership for development, aimed to galvanize support – particularly financial support – for the achievement of the MDGs as a whole. However, a number of the targets related to this proposed global partnership for development were defined in an imprecise manner, weakening the likelihood of establishing the networks needed to provide such support (see United Nations, 2011). In the first attempt by the United Nations system to apply lessons learned from the MDGs to a new post-2015 development agenda, one of the most striking recommendations is that, for a global partnership of this type to succeed, it should not be limited to resource mobilization and should be constructed in a much more participatory manner, with more reflection given to the knowledge that resides in a wider range of actors, including governments, civil society, the private sector and foundations (United Nations, 2012).

2. THE NEW KNOWLEDGE PLAYERS: FROM BRICS TO BUSAN

Just as the MDG framework became the dominant paradigm for development cooperation, noticeable changes were emerging in how industrialized and developing countries, or North and South, related to each other. Between 1990 and 2008, world trade expanded fourfold, spurred on by a wave of globalization that saw South-South trade escalate by more than twenty times its initial level. Indeed, despite the ongoing financial and economic crises, South-South relations have continued to be characterized by a noticeable increase in trade and investment (United Nations, A/66/229). The ascendancy of emerging economies from the South, including – but not limited to – the BRICS countries of Brazil, Russia, India, China and South Africa, brings important implications for international approaches to development and multilateral priority-setting.

This is not to claim that the role of the South in development cooperation is a new one. Many developing countries have themselves been engaged for many years in activities to promote economic development and welfare, to provide technical assistance, and to give humanitarian aid (Mawdsley, 2012). As Mawdsley notes, the role of the South as a positive actor in development, even as it has grown, has nevertheless appeared to be somewhat out of the mainstream. One reason for this is that, while traditional donors of the DAC or Utstein school influenced the agenda towards human development, "the (re)emerging partners appear to be re-animating the modernization theories of the 1950s and 1960s, in which economic growth is the primary and prior requirement of 'development'" (Mawdsley, due 2013). Another may quite simply be that these actors are often hesitant to use terms like 'donor' or 'aid' to describe their cooperation and may characterize their actions in different ways.

However described, during the course of the 2000s it became apparent to the traditional donors that there was a need to connect to this new stream of development actors, in part because of their growing conviction that meeting the MDGs would require a much greater degree of donor togetherness. The Paris Declaration, agreed at the OECD/DAC's High-level Forum on Aid Effectiveness (HLF) in 2005, advocated recipient country ownership, donor alignment, in-country harmonization, and mutual accountability for results. This was again a clear example of an avant-garde action spearheaded by a core group, with the expectation that this would become the dominant paradigm for aid effectiveness.

While supported by a range of developing countries, and also agreed to by the United Nations system and regional development banks, the new actors from the South were conspicuously absent in Paris.

Attempts were made to include a wider range of partners at the next HLF, held in Accra in 2008. Developing countries played a more active role in the preparations and agenda, with a number of regional preparatory events hosted and organized by these countries. Civil society was also included in discussions. However, it was the fourth HLF in Busan, Republic of Korea, held in 2011, which proved to be the game changer. The final independent evaluation of the Paris Declaration had been critical of donors for not adequately adhering to the majority of principles (Wood et al, 2011), while other analyses showed that coordination between the traditional donors had even weakened (Nunnenkamp et al, 2011).

Busan echoed commitments made in Paris and Accra, but in a looser way. The emphasis was no longer on the OECD/DAC's driving role – there would now be a new 'Global Partnership for Effective Development Cooperation' which would be inclusive and represent the entire international community. Most notably, Brazil, China and India voluntarily joined in agreeing to the outcome document, a text which brings South-South cooperation and the knowledge and expertise of emerging economies into the heart of development cooperation. The document explicitly recognizes that the Global Partnership must be a multi-speed one, as different types of countries have 'differential commitments' (paragraph 1) and 'the nature, modalities and responsibilities that apply to South-South cooperation differ from those that apply to North-South cooperation' (paragraph 2). Language in the document reaffirmed commitment to economic development and the role of the private sector, while singling out South-South and triangular cooperation as extending 'well beyond financial cooperation to the knowledge and development experience of all actors and countries' (paragraph 30). Moreover, signatories agreed to encourage 'the development of networks for knowledge exchange, peer learning and coordination among South-South cooperation actors as a means of facilitating access to important knowledge pools by developing countries' (paragraph 31).

How the Global Partnership will operate in practice remains to be seen. After much discussion, a light secretariat has been established, supported by the OECD and the United Nations Development Group, with the aim of improving networking in an increasingly complex world, in which many diverse

forces have an impact on development. The Partnership is therefore likely to be a far more inclusive and representational network than its predecessor, a Working Party of the OECD/DAC. However, it is uncertain if it will manage to work effectively, or with sufficient voice for weaker countries. Whatever the case, it is clear that Busan marks a profound shift in the development landscape, with consequences for the future development agenda as well as for how complex and highly varied development actors should coordinate, create and transmit knowledge.

Whether this emerging development architecture will redefine the global aid architecture in a way that will bring "more coherence to the chaos that characterizes international cooperation initiatives", as Severino and Ray (2010) wish for, is another point that remains to be seen. It is without doubt, however, that the next era of globalization will require ever-increasing degrees of international coordination, especially calling for a strengthened United Nations system, due to its catalyst role and universal membership and legitimacy.

Equally, South-South partnerships and regional cooperation are likely to rapidly become more dominant features in the unfolding international development architecture, with network governance structures, based on multi-stakeholder knowledge networks, increasingly gaining key importance in local, regional and global policymaking. In this context, as described in the first Networks for Prosperity report (UNIDO 2011), the role of knowledge networks in processes of regional or inter-regional integration should be emphasized as a mechanism for strengthening the innovation capacities of countries, prerequisites for the achievement of development goals, including inclusive growth and sustainable development.

3. THE CRUCIAL ROLE OF MIDDLE-INCOME COUNTRIES

Since the adoption of the Millennium Declaration and the creation of the MDGs, millions have been lifted out of poverty. The percentage of the world's population living on less than $1.25 a day fell from 42 per cent in 1990 to 25 per cent in 2005, and is projected to fall to 14 per cent by 2015. This impressive success on income poverty is largely due to the increased industrialization and growth of related economic activities in a range of developing countries, and especially China. Indeed, MICs are the fastest growing group of countries, both in terms of population and key economic and human development indicators, today with a share of more than 30 per cent of global manufactured value added. However, progress towards reaching the full range of MDGs, which did not prioritize economic growth as a means of achieving development objectives, remains uneven. One remarkable change in the past two decades has been the shift in location of the world's poor from low-income countries (LICs) to MICs. It is estimated that in 1990 over 90 per cent of the world's poor people lived in LICs, while there is evidence that today almost three-quarters of the world's poor live in MICs. At the same time, the ongoing global financial and economic crises, the food and energy crises, as well as the more recent European sovereign debt crisis, have had a negative effect on world economic growth and continue to pose challenges to development efforts. Therefore, poverty reduction strategies that do not include MICs cannot be successful. They need to be seen in the global context and include economic structural transformation policies, human resource investments and targeted private sector development strategies in MICs.

Also at the centre of most forward-looking analyses or studies on global development is sustainable development. It is almost axiomatic to say that the ongoing financial and economic crises have been aggravated by negative environmental trends, of which climate change has the most critical consequences. Yet, despite the fact that the concept of sustainable development with its economic, environmental and social pillars was first articulated by the Brundtland Commission as early as 1987, its operationalization as a development paradigm has proven difficult. Indeed, resource efficiency will play an increasingly important role in the context of global stability, security and development. Inefficient technologies and operating practices currently in use by many industries in developing countries will need to be replaced. This is particularly true for MICs with a high degree of employment-creating manufacturing industries. In addition, energy access is one of the most pressing of

all the global challenges and is central to all the three pillars of sustainable development. As the impacts of climate change become clearer, it is increasingly evident that a growing share of humanity will become vulnerable to its effects, which renews the urgency to move towards "green" industry in developing and industrialized countries alike. In the light of the United Nations Conference on Sustainable Development held in Rio de Janeiro in June 2012 (Rio+20), at which Member States agreed to a process to draw up a set of sustainable development goals (SDGs), the opportunity to do so has now arisen. In the Conference outcome document, The Future we Want, Member States recognized that the SDGs need to be coordinated and coherent with related processes to set the post-2015 development agenda. It will be essential that MICs not only participate in the deliberations of these crucial negotiations; their active leadership and commitment will determine how successful and inclusive the emerging development framework will be.

Finally, recession in many industrialized countries has led to pressure on global official development assistance (ODA) budgets, the total spend for which declined in 2011 for the first time since 1997. On the other hand, MICs are rapidly increasing their own development cooperation and particularly triangular (North-South-South) and South-South cooperation are recognized as potential drivers of future development finance. According to some estimates, South-South cooperation already accounts for about $15 billion in development cooperation each year and could provide over $50 billion by 2025 (Kharas et al, 2012). Some analyses of South-South cooperation spending indicate a firmer emphasis on industry and economic activity generally, compared to the tendency of traditional donors to fund the social, humanitarian and governance sectors (Turner et al, 2012). It is well known that opportunities for the creation, transmission and dissemination of knowledge have transformed industry worldwide, yet there remain significant gaps in access to knowledge by many developing countries, even in upper MICs. Over the past decade it has become evident that the importance of knowledge transfer is equal to, or in some cases exceeds, the importance of technology transfer. Limited access to knowledge hampers progress towards inclusive growth and employment creation, as well as technological progress for sustainable development, and for food, nutrition and energy security. As described in the first Networks for Prosperity report (UNIDO 2011), a major challenge is thus to enhance access to policy-relevant knowledge in sustainable economic development, and to create the space for national, regional and global knowledge streams and networks for policymaking and capacity-building, particularly among MICs.

4. BEYOND 2015: AN ECOSYSTEM OF DEVELOPMENT KNOWLEDGE

The tracks leading to the development agenda beyond 2015 are complex, increasing in number, and quite different to those that led to the MDGs. First, the outcome document of the 2010 High-level Plenary Meeting of the United Nations General Assembly on the progress towards the MDGs requested the Secretary-General to make recommendations to advance the United Nations development agenda beyond 2015. Initial recommendations in this regard were presented in August 2011 in the Report of the Secretary-General on accelerating progress towards the MDGs (United Nations, A/66/126), with special reference to the need for an open and inclusive process of consultations on the agenda. This led to the establishment by the Secretary-General of a system-wide Task Team (UNTT), which was charged with producing a report reviewing the successes and challenges of the MDG process and providing some general options on the way forward for the development agenda (United Nations, 2012).

The UNTT report provides one basis for discussion of a High-level Panel on the Post-2015 Development Agenda (HLP), established by the Secretary-General in June 2012 under the tripartite co-chairmanship of the United Kingdom (Prime Minister Cameron), Liberia (President Johnson Sirleaf), and Indonesia (President Yudhoyono). The HLP has been tasked with producing a major report by May 2013, which is expected to inform discussions among Member States in a High-level Meeting on the MDGs and post-2015 to be held in autumn 2013 at the General Assembly. Further relevant reports will be prepared by the Secretary-General for ECOSOC and for the General Assembly. Consideration of the parameters and detail of the post-2015 development agenda will eventually take place in the General Assembly, most likely during 2014.

In June 2012, the outcome document of the United Nations Conference on Sustainable Development (Rio+20) provided for an Open Working Group (OWG) of 30 Member States to be inaugurated at the beginning of the 67th session of the General Assembly in September 2012 (United Nations, A/66/288). The OWG is tasked with submitting a report to the 68th session of the General Assembly containing a proposal for a set of sustainable development goals (SDGs). According to the outcome document (para 249), the SDG process "needs to be coordinated and coherent with the process leading to the post-2015 development agenda". In order to provide technical support to this process and to the

work of the working group, the Secretary-General was asked to ensure all necessary input and support to this work from the UN system including through the establishment of an inter-agency technical support team (TST, of which UNIDO is a member agency) and expert panels as needed, drawing on all relevant expert advice. Reports on the progress of work will be made regularly to the General Assembly.

In addition to the above, there are a range of formal and informal processes, publications and events that are seeking to influence the agenda beyond 2015, many of which are taking place at the country level. From the side of the United Nations, there is a determination to make sure that accusations of lack of inclusiveness cannot be levelled this time. However, this is tempered by the experience of how the actionable MDGs, whatever their faults, were derived from a more exclusive process than that which led to the Millennium Declaration. One potential solution to this conundrum is to recognize and embrace the multi-polarity of the development landscape, building an ecosystem of decentralized and flexible networks for development knowledge and development results. In essence, this means building the post-2015 agenda around an improved version of the maligned MDG 8, instead of merely viewing partnership as supportive of other goals.

Although the MDG conception of a global partnership was framed as incentivizing stakeholders in all countries, the subtext was mostly about a compact between the industrialized North (through official development assistance (ODA), debt relief, extensions to market access, and established private sector entities making technologies more accessible) and a poor South. This framing is increasingly losing its relevance as the lines between country typologies blur, and new modes of cooperation become more important. Southern-led or triangular development initiatives, knowledge exchange activities and partnerships to address poverty and other socio-economic issues can become a determining feature of the international development architecture in a multi-polar world.

There are already some clear instances of how the international community is using networks to deal with complex facets of the post-2015 agenda. The decision by the United Nations Secretary-General and the President of the World Bank to further a global initiative on Sustainable Energy for All through establishing a 'network of networks', building on expertise residing in the public sector, private sector, civil society and academia, is one such example. Similarly, UNIDO's Green Industry initiative is built on the recognition that the future of industrial governance will be of a multi-sector and action-oriented nature.

In view of the importance of knowledge networking and the potential to make knowledge exchange a defining pillar for the implementation of any post-2015 development strategy, some of the most successful networks appear to be those addressing regional or global issues through cross-border, peer-to-peer knowledge sharing and multi-stakeholder governance. This second Networks for Prosperity report aims to contribute to this development with new empirical findings on the importance of domestic and international connectedness for achieving development objectives, academic think pieces on various aspects of knowledge networking, and examples for good network governance from around the world.

Part 2: Measuring Connectedness and its Impact

The intricacies of knowledge networks present a variety of innovative mechanisms for alleviating or circumventing typical barriers to industrial development. But at first glance, networks are abstract and nebulous in nature, differing greatly from traditional governance structures easily identified by a parliament, head of state or an administration. This in mind, a sound understanding of network characteristics is necessary for understanding the true potential of knowledge networks to impact development goals. A thoroughly conceptualized concept of networks allows a deeper delve into understand the variety of networks, their

magnitude, and how, specifically, they can impact private sector development and overall economic growth.

Noting a marked gap in academic literature, contributions in this section set forth two distinct measurements of networks. Both highlight connectedness, or the degree to which a country is networked. Measuring how well a country is connected can indicate whether networks are indeed contributing factors for development. Rankings are generated that list the countries from most connected to least connected as follows:

| 1.0 - 0.8 | 0.79 - 0.6 | 0.59 - 0.4 | 0.39 - 0.2 | 0.19 - 0 | No data |

The Connectedness Index 2012 is the average of three subindices (International, lnter-organizational, and Intraorganiutional Networks). This map shows the level of overall connectedness of countries for which data was available.

Table 2.5: Connectedness Index

ISO code	Country	Connectedness 2012 Index	Connectedness 2012 Rank	Connectedness 2011 Index	Connectedness 2011 Rank	Ranking Differences 2011-2012
CHE	Switzerland	0.977	1	0.971	1	0
SWE	Sweden	0.915	2	0.913	2	0
DNK	Denmark	0.886	3	0.901	3	0
NLD	Netherlands	0.873	4	0.886	5	1
BEL	Belgium	0.859	5	0.875	6	1
FIN	Finland	0.849	6	0.863	7	1
SGP	Singapore	0.838	7	0.836	9	2
IRL	Ireland	0.822	8	0.803	12	4
CAN	Canada	0.822	9	0.813	11	2
USA	United States	0.820	10	0.887	4	-6
NOR	Norway	0.818	11	0.813	10	-1
AUT	Austria	0.818	12	0.837	8	-4
GBR	United Kingdom	0.785	13	0.770	14	1
CZE	Czech Republic	0.758	14	0.705	20	6
AUS	Australia	0.758	15	0.755	16	1
LUX	Luxembourg	0.741	16	0.695	21	5
ISL	Iceland	0.729	17	0.748	17	0
DEU	Germany	0.723	18	0.773	13	-5
MYS	Malaysia	0.711	19	0.716	19	0
NZL	New Zealand	0.701	20	0.682	22	2
FRA	France	0.691	21	0.756	15	-6
JPN	Japan	0.687	22	0.736	18	-4
THA	Thailand	0.666	23	0.650	26	3
EST	Estonia	0.653	24	0.640	28	4
CHL	Chile	0.640	25	0.609	33	8
ZAF	South Africa	0.625	26	0.622	30	4
ESP	Spain	0.624	27	0.613	32	5
SVN	Slovenia	0.622	28	0.666	24	-4
CYP	Cyprus	0.619	29	0.583	35	6
ISR	Israel	0.618	30	0.677	23	-7
KOR	Korea, Republic of	0.610	31	0.654	25	-6
BRA	Brazil	0.603	32	0.561	39	7
POL	Poland	0.598	33	0.523	42	9
PRT	Portugal	0.582	34	0.562	38	4
QAT	Qatar	0.577	35	0.569	37	2
TUN	Tunisia	0.574	36	0.635	29	-7
IND	India	0.573	37	0.554	40	3
ARE	United Arab Emirates	0.565	38	0.506	46	8
HUN	Hungary	0.548	39	0.590	34	-5
ITA	Italy	0.538	40	0.575	36	-4
CRI	Costa Rica	0.537	41	0.507	44	3
CHN	China	0.536	42	0.613	31	-11
SVK	Slovakia	0.529	43	0.645	27	-16
MLT	Malta	0.515	44	0.464	56	12
PAN	Panama	0.512	45	0.506	45	0
ARG	Argentina	0.503	46	0.469	53	7

BRB	Barbados	0.503	47	0.470	52	5
PER	Peru	0.496	48	0.475	51	3
RUS	Russian Federation	0.496	49	0.423	70	21
COL	Colombia	0.482	50	0.451	60	10
DOM	Dominican Republic	0.480	51	0.430	66	15
SAU	Saudi Arabia	0.477	52	0.469	54	2
PRI	Puerto Rico	0.477	53	0.463	58	5
VNM	Viet Nam	0.476	54	0.429	67	13
IDN	Indonesia	0.474	55	0.502	47	-8
JOR	Jordan	0.472	56	0.491	48	-8
KEN	Kenya	0.469	57	0.468	55	-2
HRV	Croatia	0.466	58	0.484	49	-9
LTU	Lithuania	0.463	59	0.544	41	-18
JAM	Jamaica	0.459	60	0.514	43	-17
SLV	El Salvador	0.457	61	0.405	76	15
KAZ	Kazakhstan	0.454	62	0.421	72	10
BHR	Bahrain	0.450	63	0.477	50	-13
TTO	Trinidad and Tobago	0.445	64	0.420	74	10
NGA	Nigeria	0.443	65	0.444	62	-3
LKA	Sri Lanka	0.443	66	0.464	57	-9
GTM	Guatemala	0.439	67	0.418	75	8
UKR	Ukraine	0.435	68	0.421	73	5
NAM	Namibia	0.434	69	0.399	78	9
MEX	Mexico	0.433	70	0.397	79	9
TUR	Turkey	0.431	71	0.402	77	6
PHL	Philippines	0.428	72	0.451	61	-11
GRC	Greece	0.428	73	0.422	71	-2
BGR	Bulgaria	0.427	74	0.454	59	-15
GMB	Gambia	0.422	75	0.356	92	17
ARM	Armenia	0.421	76	0.369	88	12
SEN	Senegal	0.420	77	0.394	80	3
ZMB	Zambia	0.420	78	0.425	69	-9
OMN	Oman	0.416	79	0.388	82	3
ROU	Romania	0.413	80	0.436	63	-17
URY	Uruguay	0.411	81	0.378	84	3
MNG	Mongolia	0.404	82	0.317	104	22
MNE	Montenegro	0.402	83	0.375	85	2
GUY	Guyana	0.389	84	0.303	107	23
KHM	Cambodia	0.389	85	0.366	89	4
KWT	Kuwait	0.388	86	0.431	65	-21
HND	Honduras	0.386	87	0.374	86	-1
SRB	Serbia	0.385	88	0.384	83	-5
MUS	Mauritius	0.383	89	0.431	64	-25
BWA	Botswana	0.379	90	0.353	93	3
EGY	Egypt	0.378	91	0.363	90	-1
BRN	Brunei Darussalam	0.378	92	0.346	96	4
LVA	Latvia	0.375	93	0.425	68	-25
MAR	Morocco	0.374	94	0.391	81	-13
ECU	Ecuador	0.373	95	0.370	87	-8

GHA	Ghana	0.365	96	0.347	95	-1
MWI	Malawi	0.364	97	0.337	99	2
UGA	Uganda	0.360	98	0.338	98	0
AZE	Azerbaijan	0.351	99	0.356	91	-8
MDG	Madagascar	0.350	100	0.310	106	6
BOL	Bolivia, Plurinational State of	0.350	101	0.319	102	1
MLI	Mali	0.347	102	0.317	105	3
LSO	Lesotho	0.340	103	0.298	110	7
ZWE	Zimbabwe	0.335	104	0.331	100	-4
BIH	Bosnia and Herzegovina	0.331	105	0.295	112	7
CIV	Côte d'Ivoire	0.329	106	0.348	94	-12
MOZ	Mozambique	0.326	107	0.302	108	1
LBY	Libya	0.326	108	0.290	114	6
TZA	Tanzania, United Republic of	0.325	109	0.228	125	16
CMR	Cameroon	0.307	110	0.318	103	-7
TCD	Chad	0.303	111	0.246	121	10
PRY	Paraguay	0.300	112	0.266	117	5
MRT	Mauritania	0.296	113	0.300	109	-4
MKD	Macedonia, the former Yugoslav Republic of	0.296	114	0.343	97	-17
KGZ	Kyrgyzstan	0.292	115	0.297	111	-4
VEN	Venezuela, Bolivarian Republic of	0.292	116	0.295	113	-3
BEN	Benin	0.288	117	0.255	120	3
ETH	Ethiopia	0.287	118	0.320	101	-17
ALB	Albania	0.282	119	0.227	126	7
NIC	Nicaragua	0.281	120	0.244	122	2
DZA	Algeria	0.280	121	0.243	123	2
PAK	Pakistan	0.274	122	0.261	118	-4
BFA	Burkina Faso	0.265	123	0.278	115	-8
SYR	Syrian Arab Republic	0.263	124	0.260	119	-5
MDA	Moldova	0.243	125	0.235	124	-1
TMP	East Timor	0.225	126	0.200	130	4
GEO	Georgia	0.223	127	0.225	127	0
TJK	Tajikistan	0.221	128	0.274	116	-12
BDI	Burundi	0.206	129	0.147	132	3
BGD	Bangladesh	0.204	130	0.219	128	-2
NPL	Nepal	0.127	131	0.186	131	0
SUR	Suriname	0.081	132	0.204	129	-3
	Median:	0.441		0.429	Average Difference:	6.636

The first Network for Prosperity report provided the first contribution to constructing a measure which aims to capture the degree to which countries are networked, both internally as well as externally. The key effort last year was to identify the information necessary to quantitatively capture the importance of networks. In this year's report, results are updated and compared with a similar index (Ghemawat Index) commissioned and published by DHL. The UNIDO Connectedness Index identifies three distinct levels of networks (international, inter-organizational, and intra-organizational) and incorporates relevant economic and political variable to construct a connectedness ranking across the three identified levels.

Figure 2.1: Connectedness Index

- Connectedness Index
  - International Networks
    - Political Globalization (KOF)
    - Economic Globalization (KOF)
  - Inter-organizational Networks
    - University Industry Collaboration (GCR)
    - Networks and Supporting Industries (GCR)
    - Professional Association (WVS)
  - Intra-organizational Networks
    - Firms Offering Training (WB-ES)
    - On the Job Training (GCR)
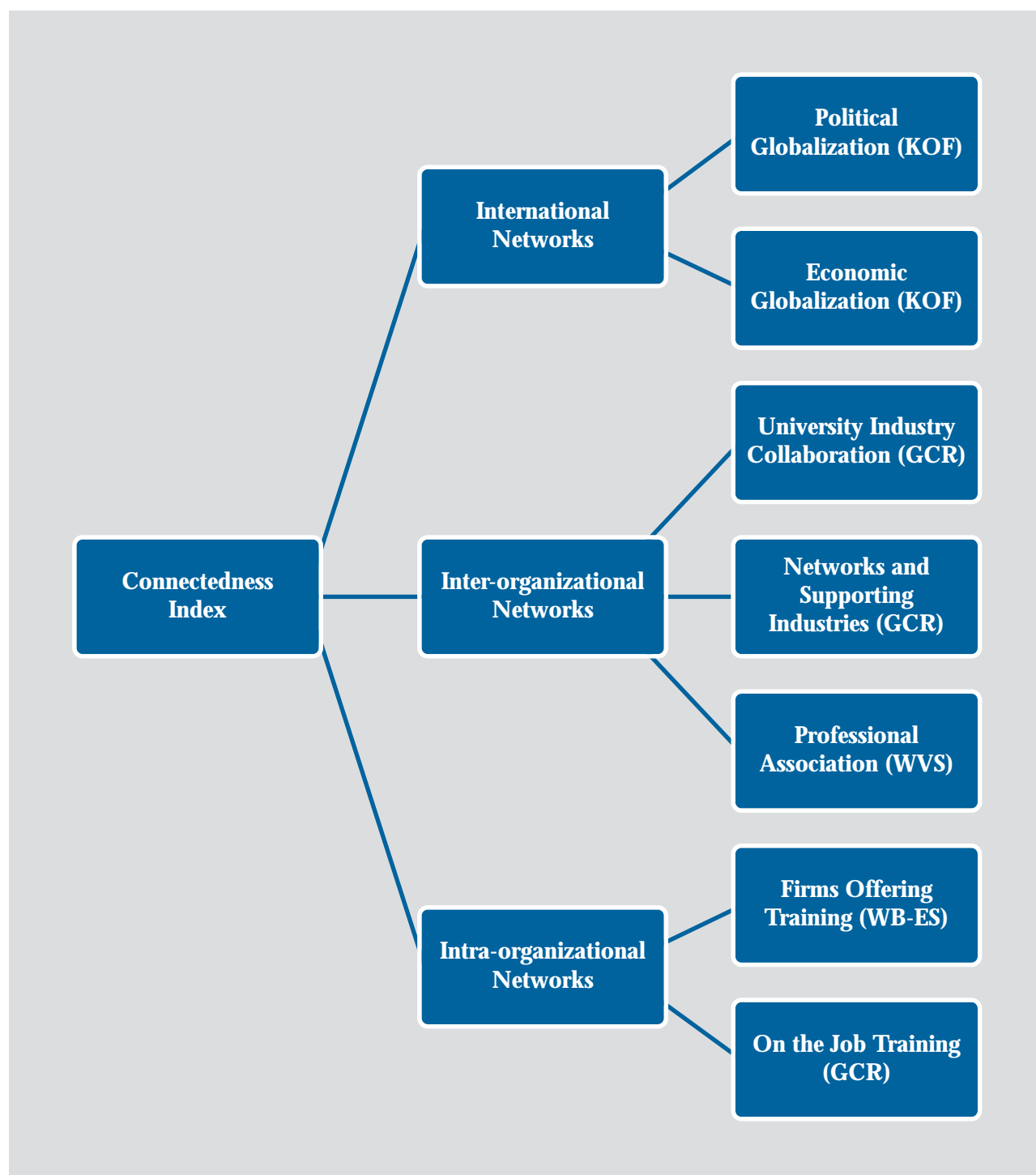
THE CONNECTEDNESS INDEX 2011 AND 2012 COMPARED

The Connectedness Index 2012 is compared with the Connectedness Index 2011. The differences between these indices are presented in table 2.5. Minimal differences separate the rankings of the countries in the top of the list. The three countries in the top of the list – Switzerland, Sweden and Denmark – reach exactly the same positions. The Netherlands, Belgium and Finland increased their ranking by one position each. Singapore increased two spots in the ranking.

Among the top ranked countries, the most significant changes are in the United States and the Czech Republic's rankings. Between 2008 and 2009, the United States score on the international networks sub-index decreased; the country consequentially dropped from the 4th to the 10th position in the 2012 Connectedness Index. In contrast, the Czech Republic jumped 6 positions, from the 20th to 14th. The Czech Republic increased in all three sub-indices, most dramatically in the intra-organizations sub-index.

The average difference (up or down) is 6.6 ranking positions. Nine countries keep the same positions as in the previous ranking and another 38 change a maximum of 3 positions. 26 countries change more than 10 positions from one year to the next. Mauritius and Latvia experience the greatest changes (from 64th to 89th, and from 68th to 93rd), the latter dropping 25 positions between the two indices. On the other hand, Guyana, Mongolia and Russia most significantly increased their ranking positions. Guyana jumps 23 positions, from the 107th to 84th; Mongolia increases 22 positions, rising from 104th to 82nd: and Russia improves 21 positions, from the 70th to the 49th position. Overall, there was a slight increase in the median score of countries, from 0.429

to 0.441, indicating that more countries achieve higher scores indicating that they are becoming more connected.

It is interesting to note that, given the methods for calculating scores and the 0 and 1 scoring range, small score differences can make significant differences in the ranking positions. Serbia and Singapore, for example, present a very small increase in their scores from 2011 to 2012 (almost the same score), but Serbia decreased 5 positions and Singapore won 2. On the other hand, the differences in scores are higher in the case of Switzerland (positive) or Malaysia (negative), but the countries maintain the same rankings in the 2011 and 2012 Connectedness Indices.

THE RELATIONSHIP BETWEEN CONNECTEDNESS AND GOVERNMENT, INDUSTRIAL AND ECONOMIC PERFORMANCE

The quantitative nature of data produced lends to a series of graphs and a correlation matrix. Arranging the results in this way helps expose the relationship between connectedness and government effectiveness, regulatory quality, competitive industrial performance, and GDP per capita PPP. The graphs clearly show a strong positive linear relationship between connectedness and the various performance indicators. Given the linear relationship between the variables (see graphs 2.4-2.7), the Pearson Product-Moment Correlation Coefficient is used to measure the relationship between the different indicators, although no causal inferences were intended with this analysis. The correlations between the Connectedness Index and the four development measures listed above are high, ranging from 0.721 (connectedness x GDP per capita) to 0.845 (connectedness x Government Effectiveness) (presented in table 2.6). This indicates that, in the majority of the cases, connectedness and these development measures follow the same direction, i.e., when one increases (decreases), the other follows a similar standard. Graphs 2.4 to 2.7 demonstrate this trend.

Graph 2.4: Government Effectiveness x Connectedness Index

Graph 2.5: Regulatory Quality x Connectedness Index

Graph 2.6: Competitive Industrial Performance x Connectedness Index

Competitive Industrial Performance

2012 Connectedness Index

Graph 2.7: GDP per capita PPP x Connectedness Index

GDP per capita PPP

2012 Connectedness Index

Table 2.6: Correlations

	Connectedness Index	Political globalization	Economic globalization	International Net.	Inter-firm Networks	University-industry Net.	Professional Association	Inter-org. Networks	% firms offering formal training	On-the-job Training	Intra-org. Networks	Government Effectiveness	Regulatory Quality	Competitive Industrial Performance	GDP per capita PPP
Connectedness Index	1														
Political globalization	.525**	1													
Economic globalization	.599**	-.036	1												
International Networks	.779**	.795**	.578**	1											
Inter-Firm Networks	.854**	.468**	.315**	.529**	1										
University-Industry Net.	.906**	.406**	.420**	.570**	.823**	1									
Professional Association	.111	-.131	-.092	-.162	.049	.066	1								
Inter-org Networks	.904**	.408**	.340**	.511**	.904**	.932**	.328**	1							
% firms offering formal training	.510**	.181	.332**	.360**	.181**	.192**	-.076	.157	1						
On-the-Job Training	.926**	.394**	.466**	.597**	.885**	.918**	.037	.905**	.198**	1					
Intra-org. Networks	.929**	.366**	.440**	.559**	.778**	.843**	.009	.814**	.868**	.896*	1				
Government Effectiveness	.845**	.176**	.489**	.449**	.748**	.814**	.086	.797**	.281**	.839**	.709**	1			
Regulatory Quality	.792**	.236**	.467**	.483	.715**	.741**	.046	.731**	.284	.773**	.658**	.928**	1		
CIP	.746**	.446**	.314**	.529**	.761**	.771**	-.011	.754**	.255**	.758**	.687**	.703**	.657**	1	
GDP per capita	.721**	.275**	.490**	.533**	.665**	.690**	-.040	.667**	.311**	.714**	.638**	.788**	.733**	.605**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

A second contribution comes from researchers at the
European University Institute in Florence. In contrast
to the first contribution, efforts here target the
measurement of networks' impact on economic
growth. The authors focus on the causal relationship
between networks, utilizing bilateral trade and
economic data to measure a state's connectedness via
a measure of trade integration.

Taken together, these contributions offer nuanced
approaches to measuring networks. The differences
in methodologies and data used in the two
measurements (as well as in the Ghemawat
Connectedness Index which is extensively discussed
in the first contribution) indicate that the idea of
networks, particularly knowledge networks, demands
further quantitative conceptualization and
methodological validation but hold great exploratory
and explanatory value. These quantitative endeavours
exploring how to describe a country's connectedness
set the stage for contributions further on in the report
that explore specific countries' and NGOs '
experiences with networks and as well as
contribution that highlight the complexities of
networks.

Part 3: Knowledge Networks in Practice

Theoretical explorations of networks are only valid if they hold in practice. This section turns attention to networks in the real world, looking at four separate, issue-specific networks. Regional, business, trade, and development cooperation networks are the subject of the case studies that follow. Each contribution highlights the interworking of these networks and draws attention to the relevant actors, strategies, and outcomes across organizational units.

The first contribution, by Jorge Rodríguez Vives, documents the creation of a Competitiveness Council within Costa Rica. The Brunca Region, located in the southwest corner of Costa Rica, introduced the Council in order to revive local private sector development and vamp efforts to improve local welfare, particularly for women and youths. The contribution documents the Council's experiences pairing policy makers, business owners and community members with academic support to address competitiveness in four key local business sectors: agri-business, tourism, municipal sectors, and government agencies. In turn, the Council fermented information transfer and learning, two key functions of knowledge network and a prime example of an inter-organizational network.

Trade networks are the subjects of the second contribution by Johan Adriaensen. The trade and development link, in particular, is examined, and the author employs network theory to understand how trade administrations work. Three specific trade administrations are highlighted, and the administrations' role in building a knowledge network is seen to be instrumental to develop a trade policy and as input in trade negotiations.

A third contribution, by Ariane Agnes Corradi, shifts attention south of the equator to Brazil but keeps sights on business development. This case study focuses on the impacts of networks in business incubators which are designed to aid new businesses in overcoming barriers to market entry and participation. The business incubators under study uniquely emphasize the role of informal networks at the inter-organizational level and the importance of incubator managers as network facilitators.

A fourth case study, by Thomas Vogel and Petra Koppensteiner, comes from an Austrian NGO dedicated to development cooperation. The report from HORIZONT3000 documents the construction of a network for the sharing of "best practices" among partner organizations in the developing world. The organization's experiences in building a knowledge network are detailed, noting their construction of an international network consisting of Austrian organizations, local development partners, and research partners. HORIZONT3000's contribution incorporates a practitioner's perspective and the organization's efforts to encourage "systematization"- a participatory process of generating and sharing knowledge- yield lessons for knowledge management in practical situations.

Though each case covers different actors, regions, or sectors, they together form a dynamic picture of various functioning networks and how knowledge make a difference and create added value. Challenges and responses for the Brunca Region's construction of a Competitiveness Council, for example, can underscore the lessons exposed in HORIZONT3000's contribution. The diversity of public and private actors and their functioning across the international, inter-organizational and intra-organizational levels also point to boundaries for knowledge networks, later detailed in section 4.

Part 4:
Exploring the Boundaries of Knowledge Networks Governance

The case studies presented in part 3 detail networks as they occur in four distinct environments. This sections attempts to dig deeper into understanding how and to what degree knowledge networks differ. This task in turn exposes factors that influence network formation, a network effectiveness, and a network's capacity to manage and create knowledge. Here, attention moves to knowledge networks. Knowledge networks foster the flow of know-how, learning processes, and management practices. Within these capacities we see how the design and management of knowledge networks can inspire private sector development. The contributions in this part reflect on these issues and provide key insights on network governance.

Jacint Jordana provides the first contribution to this section. His contributions focuses on the impressive growth of regulatory agencies across policy sectors in most countries from the OECD. Regulatory agencies are explored here, as they act as nodes in a network. In focusing on how regulatory agencies collect and distribute relevant information to interested parties, this piece demonstrates the capacity for quasi-government organizations to help overcome information disadvantages, which often decreases performance of pertinent sectors. This contribution points to the central role played by regulatory agencies in a global knowledge network. The contribution from Ettore Bolisani and Enrico Scarso follows, shifting the focus from regulatory agencies to inter-organizational knowledge networks. Their research identifies a host of new challenges for business management and policy-making, and sees knowledge networks as a potent solution for many of these issues. Various typologies of knowledge networks are parsed out in this piece, as are the factors that influence knowledge sharing among firms. Doing so indicates that within knowledge networks, the success of one network member influences the success of a single company in the network. Ana Aleksić Mirić authors the third contribution to this section and focuses on barriers to learning in business network forms of governance. Her research emphasizes that not all knowledge networks are learning networks, and, concentrating on the intra-organizational and inter-organizational level, that network design (and redesign) can improve learning flows across the network.

Turning attention to international networks, Timothy Meyer's research concentrates on the governance systems best capable of transferring scientific information. His research presents networks as a middle way between markets and hierarchical governance architectures, keenly noting that there are costs associated with both markets and hierarchical types of architecture. In this way, there are instances where networks (as opposed to markets or hierarchies) are the most efficient in terms of costs, but such is not always the case. A case study focusing on the International Renewable Energy Agency (IRENA) serves to exemplify the author's proposition.

Human capital and knowledge retention is the subject of Orly Lobel's contribution. Like the contribution by Ana Aleksić Mirić, the author treats hurdles for knowledge network creation. Recognizing recent, significant changes in economic structures, the author investigates the way knowledge flows can contribute to innovation and explores the barriers preventing knowledge flows between firms. Intellectual property issues are at the core of arguments presented, as overprotection of such rights impedes the improvement of a given idea, technology, or practice. Encapsulation of human capital results, thus impeding knowledge network formation and inhibiting innovative behaviors. The implications of this contribution are profound for international knowledge management.

Michele Clara of UNIDO rounds out this section and incorporates the perspective of policy-makers on the subject of knowledge networks. Significant challenges threaten industrial development, and this contribution presents arguments for a realignment of the academic debate of growth and development that embrace industrial developments' potentials. UNIDO's member states, sensing the need for such a shift, are rallying around the idea of knowledge networks as a mechanism for overcoming barriers to private sector and industrial development. An approach that crosses the international, inter-organizational, and inter-organizational network levels is stressed, and multilateral organizations such as UNIDO serve as key players in networks dedicated to improving global industrial development.

Overall, these chapters paint a complex picture of knowledge networks and depict a complicated system of actors. But in each contribution lie insights with the potential to inform knowledge network construction and maintenance; as a result, these are findings that pave the way for policies supporting successful private sector development. Though these networks prove to be intricate, these contributions demonstrate that knowledge networks hold the potential to mitigate traditional governance hurdles and pave a path for effective industrial development through private sector growth.

Part 5:
Networks for Prosperity – Connecting development knowledge beyond 2015

KEY FINDINGS

Without doubt, knowledge networks and network governance will play a crucial role in the emerging post-2015 development agenda and the new post-Busan aid architecture. Networks do not only constitute a distinct way of organizing transactions between actors but more importantly are emerging as a new paradigm for governance. A key component of this paradigm revolves around the exchange of information and the creation of knowledge. In the first Networks for Prosperity report (UNIDO 2011) we conceptually clarified this and linked it to private sector development. The first report argued that networks play a key role in diffusing information and generating knowledge and hence contribute directly to economic development. Moreover the report illustrated that network governance is becoming increasingly important on a local, national, regional and global scale. Consequently the report introduced network governance as a distinct way of governing. Most importantly the report made a conceptual distinction in types of networks in order to clarify that networks differ in nature and that this difference is relevant in the context of knowledge management and information provision. The key points stressed were:

1. Networks are crucial for information exchange and knowledge creation and diffusion and contribute significantly to knowledge management.

2. Networks are becoming increasingly a distinct form of governance with the aim of including different types of public and private actors within and across organizational and national boundaries.

3. Not all networks are equivalent and differ in nature. Different types of networks exist and some are more instrumental in the context of learning, information exchange and knowledge creation.

4. There is a significant benefit to be gained from institutionalizing or embedding networks and hence investing in networks. The creation of trust and social capital which follows from this is beneficial for organizations and the economy as a whole.

5. It is crucial not only to embed networks but also to be involved in other or new networks which will provide new information, knowledge and opportunities.

6. From an actor's or organization's perspective successful networking implies the development of solid networks which continue over time and are built on trust; and constantly moving between relevant other networks to capture new information.

7. Networks are proliferating. Given the increasing choice of networks, the importance of seriously investing in some networks and institutionalising network ties in these networks (high administrative co-ordination cost) and the importance of balancing arm-length ties with embedded ties it is becoming important to develop clear networking strategies with specific objectives.

8. Knowledge on networking strategies and managing effective and efficient networks is more limited. Efforts to generate knowledge and best practices on network management and the development of network strategies, especially in the context of private sector development, would be welcomed. The latter can be achieved via study visits, workshops or illustrative case studies. These activities can contribute to identifying success factors for network management.

This second report builds on this in several ways. First, the report launched a new edition of the connectedness index and compared it to other indices. Indeed, since the launch of the first report we saw several related new indices see the light. Many of these build on earlier efforts to capture a degree of globalization and basically measure the degree to which countries are internationally networked or integrated. The UNIDO Connectedness Index is conceptually distinct in that it not only measures the degree to which countries are internationally, externally networked but also internally. Indeed, as many contributions in this report highlight, the importance of networks lies not only in making international connections, but also internally. Jacint Jordana highlights the network nature of many regulatory agencies across the world and Johan Adriaensen identifies distinct forms of network organization in the context of trade policy in three distinct policy administrations. Proposing a multi-level concept of connectedness captures better the ideas embedded in the notion of network governance. What emerges from these rankings is not so much a division between the 'North' and 'South', but between highly networked societies and less networked societies, countries moving from the periphery to the core grasping the importance of being connected. The hypothesis is that those countries that understand the importance of networks, as is illustrated in the case of Costa Rica, can develop distinct advantages in their pursuit of prosperity.

Secondly, the report presented a set of case studies which delve further into the diversity of networks and highlights that network governance ranges from the local to the global and from public actors to private actors such as NGO's. Thirdly the essays in the third part reflect on different key aspects related to network governance focusing on the diversity of networks (Bolisani) and the importance of overcoming different types of barriers in effective network governance (Mirić). These essays also reflect on key issues in relation to the management of knowledge in international organizations and beyond. Tim Meyer describes different strategies and governing knowledge in international organizations and Orly Lobel expands the issues by reflecting on how different types of knowledge should or should not be governed. The implications of these contributions are profound. They sketch a silent transformation which (international) organizations have to confront. This transformation is one in which knowledge is managed in hierarchical terms within the boundaries of an organization to a context in which knowledge moves in and out of organizations depending on the networks in these organizations

operate. How to deal with this will have significant implications for the design and management, including the human resources management, of these organizations. As Michele Clara identifies, this opens opportunities for international organizations but will also require vision and a well-developed change management plan.

To further investigate these profound changes the United Nations Industrial Development Organization (UNIDO) and the Leuven Centre for Global Governance Studies (GGS) intend to further collaborate. Expounding the dynamics of networks and network governance is the goal of the partnership between UNIDO and GGS. This undertaking combines UNIDO's recognition of networks as major contributors to private sector development. To this end, UNIDO founded a concerted, long-term programme to utilize knowledge networks to support developing countries in acquiring and adapting PSD-relevant knowledge to their specific contexts and needs. Research at the GGS undergirds these efforts; recognizing networks as an emerging governance structure, the profound lack of scientific research on this phenomenon, and the potential for such research to more efficiently utilize network to reach development goals, the partnership has identified three intermediate goals to better understand the dimensions of network governance.

First, our partnership strives to more concretely define network governance. Initial collaboration identified three levels on which networks operate (the inter-governmental, inter-organizational, and intra-organizational levels) and three general types of networks (learning, information exchange, knowledge management), but networks as governance mechanisms remain poorly concept-ualized. To this end, research empirically and qualitatively analyses various network structures between and within countries, among private and public actors; doing so allows a more accurate picture to be drawn of the capacity for networks to more succinctly identify how these networks govern. The policy interest that prompt such a question triggers a theoretical investigations into market-based, hierarchical, and network governance architectures and their relevance given recent patterns and innovations in global governance. In order to

achieve this aim the partnership will continue to approach network governance from a multidisciplinary perspective, taking into account the various political, economic, sociological, psychological and legal studies of network governance building on the group of experts who are already involved in the initiative.

Secondly, the partnership aims to gain in-depth knowledge on the emergence, development and effectiveness of networks with special attention to private sector development and success factors for designing network forms of governance. Here we will have to break new ground. The essays and cases gathered in this report point to some success factors in terms of strategy, leadership and culture but also provide a canvass of the diversity of issues and organizations we capture under the umbrella of networks. Identifying success factors will require understanding this diversity. There will be no one-fit for all. In this context it is also crucial to better understand what we mean with success factors of effective networks. Effectiveness of networks can be understood to mean different things to different people. As a result, it is important to approach effectiveness as a multi-dimensional concept which can be analysed according to a number of interrelated dimensions, which include problem solving effectiveness, process effectiveness, behavioural effectiveness, constitutive effectiveness and evaluative effectiveness. These different dimensions capture different elements of effectiveness:

○ Goal attainment/problem solving effectiveness refers to the degree to which specific goals, as stated for example in the mission statement of a network organization, are achieved.

○ Process effectiveness refers to the degree knowledge generated in a network is adopted by the partners of the network.

○ Behavioural effectiveness is a measure of the degree to which the network and the knowledge generated in a network generates differences in behaviour and practices of the members or actors in the network.

○ Constitutive effectiveness refers to the acceptance of a network by a large group of stakeholders as a key institution in a given policy area.

○ Evaluative effectiveness assesses networks on a set of criteria such as equitability and legitimacy.

As a result, networks can achieve different things and be effective on one or more of these dimensions. If we want to understand factors contributing to success we need to understand how networks make an impact on these different dimensions. The partnership will continue to investigate this and build a knowledge base on designing effective networks to achieve public policy goals.

A third aim is to empirically capture the importance of networks. Here, attention focuses on constructing an empirical measurement of networks, which can evidence the tangible effects of networks on PSD and progress towards international goals, such as the current MDGs or the new development agenda expected to emerge after 2015. This empirical measurement is developed at the nation-state level and seeks to explore variation between countries. The 2011 Networks for Prosperity report contains a first attempt at describing networks in its construction of a global Connectedness index, which is followed in this report by presenting the 2012 Connectedness Index. The same caveats as identified in the first report remain and trigger our eagerness to develop better and strong indicators and indices. As argued by many leading scholars Governance by Indicators is becoming an important instrument to steer policies of countries and stimulate convergence on specific parameters. For governance by indicators to work, we need robust and validated indicators. We already have a pool of relevant indicators but much more empirical work needs to be done to better capture the degree of connectedness.

These three aims and challenges will define the further analytical work in the framework of the Networks for Prosperity initiative and will act as a guide in expanding the number of experts who are involved in the initiative. What we are witnessing and aim to grasp is a paradigm shift in governance in which a key role is reserved for international coordination and cooperation. Multilateral organizations, by nature, are central players in this new governance context. However, a particular focus should be put on the increasingly dominance of South-South cooperation and the emerging leadership of middle-income countries in the post-2015 development landscape.

THE FIRST NETWORKS FOR PROSPERITY REPORT (UNIDO 2011) RECOMMENDED THAT

(i) The international community should actively promote knowledge networking and network governance structures for achieving local, regional and global development objectives;

(ii) Member States should encourage and facilitate the international knowledge networking capacities of their own public and private institutions;

(iii) International organizations should improve their inter-institutional information and knowledge exchange systems and facilitate better knowledge networking among their members; and

(iv) An international and cross-sectoral consultation network should be established to further develop the initial findings.

Recommendations

While all four initial recommendations remain valid and highly relevant, it can be observed that progress has been made on all four levels, in particular in the framework of the emerging post-2015 development landscape. However, more work needs to be done. Based on this and the findings and conclusions of experts in this second Networks for Prosperity report, THE FOLLOWING ADDITIONAL RECOMMENDATIONS HAVE BEEN FORMULATED FOR CONSIDERATION BY MEMBER STATES:

(v) *The international community should recognize that knowledge networks, multi-sector partnerships and network governance should be at the centre of any emerging post-2015 development agenda as these are crucial ways and means towards tackling the complexities of today's state of development and globalization.* In particular, a bigger picture approach should be taken in the deliberations on the future of MDG-8 on the global partnership for development, enriching it with considerations of knowledge networking and network governance, and mainstreaming it to the centre of the development agenda. It should be recognized that without knowledge sharing and networking, including technology transfer, sustainable and inclusive patterns of global development cannot be achieved.

(vi) *Middle-income countries should enhance their role in global development cooperation through intensified knowledge networking, policy coordination and the establishment of network governance structures in fields of their shared interest.* In particular, it is proposed to organize a conference of middle-income countries to allow for focused deliberations on such shared interests in the fields of inclusive economic growth, sustainable development and finance for development. It should be recognized that without the pro-active and constructive cooperation and collaboration of middle-income countries, no meaningful global development agenda, strategy or goal can be formulated or achieved.

(vii) *The international community should embrace South-South and triangular cooperation, based on knowledge exchange and technology partnerships, as effective ways for achieving development goals, and anchor these in the post-2015 development agenda.* In particular traditional donors and international organizations should consider triangular cooperation modalities for sustainably supporting capacity building efforts, especially in middle-income countries, and for ensuring long-term results and impact of development activities, beyond the immediately visible outputs. Also, middle-income countries and international organizations should actively support bilateral and multilateral South-South cooperation, both on regional and global levels.

(viii) *The international community should advance its analysis on the link between a country's connectedness and its population's prosperity as the ultimate goal of development.* In particular, international organizations, financial institutions and their academic partners should intensify their empirical research and policy analysis in this field, and collaborate amongst each other to leverage each other's knowledge. Member States should encourage their academic institutions and development agencies to actively engage in programmes that advance the understanding of the nexus between knowledge networking, economic network governance and prosperity, and support ongoing efforts in this regard.

Introduction

This study is the second report prepared by UNIDO's Networks for Prosperity initiative. The initiative was born under the funding window "Development and the Private Sector" of the Spanish MDG Achievement Fund (MDG-F). In 2010, UNIDO, as the technical convenor agency of this thematic window, was requested by the MDG-Fund Secretariat to establish a knowledge management concept that would support developing countries in acquiring and adapting private sector development (PSD)-relevant knowledge to their specific contexts and development needs, and enhance the knowledge capabilities of the United Nations system and its national counterparts and partners in the field of PSD policy.

The first report, titled *Networks for Prosperity: achieving development goals through knowledge sharing* was launched in November 2011, as a global study inspired by initial discussions on the issue of knowledge management and networking in development cooperation that took place during a global workshop among MDG-F programme coordinators in March 2011 in Panama City. This workshop was the starting point in developing a concept for the role that knowledge networks and knowledge sharing can play in private sector development policy at local, regional and global level. The meeting also inspired a first round of consultations on knowledge networks as an essential tool for policymakers to achieve economic and other development goals.

This first report was launched in Vienna, Brussels, New York, San José and Washington D.C. between November 2011 and April 2012 and served as a basis for policy considerations related to development strategy, effectiveness and governance, and led inter alia to UNIDO General Conference resolution GC.13/Res.2 *"Knowledge networking and knowledge sharing for achieving development goals"*.

Knowledge networking and knowledge sharing for achieving development goals

The General Conference,

Recalling resolution GC.13/Res.6 on the crucial role of the productive sectors in supporting the achievement of the Millennium Development Goals,

Recalling also decision IDB.38/Dec.8 on UNIDO activities in the field of industrial policy, and in particular paragraph (g) (ii) of that same decision requesting the Director-General to support the exchange of knowledge, experiences and best practices among experts and policymakers at the global and regional level,

Recalling further decision IDB.36/Dec.13 on United Nations system-wide coherence: UNIDO's role, and in particular paragraph (d) of that same decision stressing the essential contribution of industrial development in achieving the Millennium Development Goals,

Stressing the key role of the productive sectors in reducing poverty and supporting sustainable development, and thus in the achievement of internationally agreed development goals, including the Millennium Development Goals,

Underlining the importance of international knowledge networking and the exchange of experiences and best practice for the achievement of local, regional and international development goals and prosperity,

Welcoming the role of UNIDO as convenor agency for the eighth funding window of the Spanish MDG Achievement Fund (MDG-F) on "Development and the Private Sector" and, within this context, its active coordination role in the first global meeting of Joint Programme Coordinators in Panama City from 1 to 3 March 2011 and the resulting Panama Plan of Action,

Taking note of the global report "Networks for Prosperity: Achieving Development Goals through Knowledge Sharing", launched on 14 November 2011, and in particular the newly-introduced Connectedness Index and the recommendations in the same report,

1. *Requests* the Director-General to continue to develop and foster, within the Organization's mandate and within existing resources, activities that:
    (a) Promote international knowledge networking and knowledge governance structures for achieving local, regional and global development objectives;
    (b) Encourage and facilitate the international knowledge networking capacities of public and private institutions in developing countries;
    (c) Improve the inter-institutional information and knowledge exchange systems of UNIDO in the wider United Nations context;
    (d) Support the establishment of international and cross-sectoral consultation networks to further develop the initial findings on knowledge networking and connectedness and to expand the geographic coverage of the Connectedness Index;

2. Encourages the Secretariat to strengthen its efforts to mobilize funds for the implementation of the above-mentioned activities;

3. Invites development partners to enhance their financial support to the Organization for the implementation of the present resolution;

4. Requests the Director-General to submit a report on the progress made in implementing the present resolution to the Industrial Development Board at its fortieth session.

Box 1.1: UNIDO General Conference Resolution GC.14/Res.2

The first report provided an overview on several concepts within the field of knowledge networks and public-private relationships in the achievement of private sector development and economic growth, providing new findings on correlations between these diverse concepts and illustrating the latter with country case studies inspired by institutions in the twelve countries which were implementing programmes under the Private Sector and Development thematic window of the MDG-Fund, namely Bolivia, Costa Rica, Cuba, Dominican Republic, Egypt, El Salvador, Ethiopia, Panama, Peru, Serbia, Turkey and Viet Nam (see Table 1 for an overview).

Bolivia (Plurinational State of),	National and international value chains	UNDP, UNICEF, WFP, FAO, UNIDO, ILO
Costa Rica	Competitive tourism and agro-industry	UNDP, UN-HABITAT, FAO, ILO, IOM
Cuba	Decentralization and higher production	UNDP, UNESCO, FAO
Dominican Republic	Banana value chains	UNDP, WFP, UNAIDS, WHO, FAO, ILO
Egypt	Horticulture value chains	UNDP, UNIFEM, UNIDO, ILO
El Salvador	Productive urban settlements	UNDP, UN-HABITAT, UNIDO
Ethiopia	Edible oil value chain enhancement	UNDP, FAO, UNIDO, ILO
Panama	Entrepreneurial opportunities network	UNDP, UNCTAD, FAO, UNIDO, UNWTO
Peru	Creative industries	UNDP, UNESCO, FAO, UNIDO, ILO, UNWTO
Serbia	Sustainable tourism	UNDP, UNICEF, FAO, UNEP, UNWTO
Turkey	Sustainable Linkages for SMEs	UNDP, UNIDO, ILO
Viet Nam	Green production & trade	UNCTAD, FAO, UNIDO, ILO

Table 1: Joint Programmes under the PSD thematic window

Inspired by the success of the first report, this second report *Networks for Prosperity: connecting development knowledge beyond 2015* was prepared with the aim to build on the initial findings. It wants to provide a more in-depth account and insights into the internal functioning of knowledge networks and knowledge platforms, and defining the critical factors that influence the creation and successful development of a knowledge network.

For this purpose, some twenty academic and practical experts from around the world were selected as contributors after a global call for proposals and an experts group meeting that took place in September 2012 in Vienna (see box 1).

On September 26th 2012, an Expert Group Meeting on Knowledge Networking and Network Governance took place in Vienna, co-organized by UNIDO and the Leuven Centre for Global Governance Studies. Participants included representatives from the European University Institute (EUI), the University of Belgrade, the non-governmental organisation KNOWHOW3000, the Leuven Centre for Global Governance Studies, the Institute for International and European Policy of the University of Leuven, UNIDO, the University of California San Diego, the University of Padua, the University of Georgia School of Law, the University of Coimbra, the Institute for Economic Research on Innovation (IERI) of the Tshwane University of Technology, the International Institute of Social Studies of the Erasmus University of Rotterdam, the ALTERA Research Group of the Wageningen University and ESADE Business School.

The meeting was organized with the overarching goal of peer-reviewing latest academic insights on knowledge management and knowledge networking. Papers were presented around three themes: (i) the conceptualization, design, management and measurement of networks; (ii) knowledge diffusion through networks; and (iii) transferring knowledge from networks to users. After the day of discussions on networks and knowledge management, the group itself inadvertently formed a network of researchers and practitioners in the field of knowledge networking in the public sector. A selected number of papers were selected to form the conceptual and academic basis of this second *Networks for Prosperity report.*

Box 1.2: Expert group meeting and its findings

THIS REPORT IS DIVIDED INTO FIVE PARTS:

○ *Part 1* sheds light on the changes in the development landscape over the past two decades – from the global development conferences to the MDGs and beyond – and discusses the new emerging development architecture and potential scenarios for a post-MDG world. It also links these broad developments to the increased relevance of South-South and triangular development cooperation, thus demonstrating the connection between this rise of "the South" and knowledge networks and network governance.

○ *Part 2* presents an empirical analysis of knowledge networks and international connectedness, and their relevance to development effectiveness and economic development. A new, updated, version of global Connectedness Index is introduced for 132 countries, along with an analysis on correlations between a country's connectedness and its economic success factors. This part also includes a network-based empirical analysis on economic globalization.

○ *Part 3* shows how knowledge networks actually work in the real world. From the Costa Rican case of the establishment of a competitiveness council to the networked system of business development services in Brazil and the global knowledge-networking concept of an Austrian NGO, the reader is invited to explore recent case studies that show knowledge networking and network governance in real life. In addition, this chapter illustrates the utilization of knowledge networking in the field of trade policy, comparing several trade administrations.

○ *Part 4* explores how and to what degree knowledge networks differ and provides several think pieces on knowledge networks and epistemic cooperation in the respective environments of regulatory agencies, business and international organizations, such as UNIDO and IRENA. An additional chapter calls for the free movement of knowledge as a principle factor for targeted human capital development, an essential prerequisite for any knowledge economy.

○ *Part 5* provides conclusions on the aforementioned items and formulates some recommendations that Member States may wish to consider in their deliberations on the report.

PART 1:
Towards a New Era of Networked Development

Towards a New Era of Networked Development

Kazuki Kitaoka and Cormac O'Reilly

The present chapter traces the emergence of an embryonic network-based approach to the global development agenda. It charts the experience of elaborating the Millennium Development Goals (MDGs) in the 1990s, largely a result of distilling existing knowledge towards specific aims, before examining efforts in the 2000s to encourage greater participation by non-traditional development actors.

In this connection, the chapter also explores the parallel rise of South-South and triangular cooperation as well as moves by the development community to expand the global partnership for development to include more complex forms of cooperation. It goes on to examine what appears to be the beginning of a new agenda beyond the projected expiration of the MDGs in 2015, one which is likely to place greater emphasis on building and accessing knowledge in a more decentralized and dynamic way than before. Finally, the chapter concludes by providing suggestions to developing countries on matters to consider concerning their own roles in the emerging development architecture.

1. KNOWLEDGE FUNNELLING: THE CASE OF THE MILLENNIUM DEVELOPMENT GOALS

The establishment of the MDGs as the over-arching framework for global development efforts is frequently recalled as a key outcome of the adoption of the Millennium Declaration by the General Assembly in 2000, a process in which every United Nations Member State had the opportunity to play an equal part. The Millennium Declaration could therefore be regarded as the conclusion to the ultimate participatory process – the coming together of all nations to agree a common position on how to achieve a better future for mankind. The Declaration itself had its origin in a wide range of international development publications, initiatives and conferences spanning many decades but particularly gathering steam in the early- to mid- 1990s. The publication by the United Nations Development Programme (UNDP) of its first Human Development Report in 1990 began a rapid shift away from an emphasis in development discourse on economic growth and infrastructure development towards one which saw development as a means to enrich human life and to enlarge the individual's choices. A number of mainly UN-led global conferences in the following years highlighted the need to invest in social needs such as access to nutrition, education and health services, as well as links between development and the environment, human rights, population, and gender (see Manning, 2009).

By 1995 the breadth of information on global development issues had possibly never been greater, but there was a growing feeling in some quarters that this information needed to be better analysed to arrive at areas of prioritization. The OECD's Development Assistance Committee (DAC) took it upon itself to review the future of development aid and the role of the DAC within this. One of its tasks was to examine declarations made at some of the recent UN conferences and to extract a set of actionable principles. This led to the publication in 1996 of a paper entitled "Shaping the 21st Century: the Contribution of Development Cooperation", which included a short set of proposed "International Development Goals" (IDGs), largely drawn from UN summit declarations but including rudimentary targets and indicators. The period from 1996 to 2000 saw increasing engagement and policy coordination in favour of the IDGs from a smaller group of DAC donors (mainly the "Utstein Group" of the United Kingdom, Germany, Norway and the Netherlands).

Meanwhile the Secretary-General of the United Nations began the process of preparing the Millennium Declaration, which would also contain a set of goals. Adoption of the Declaration by the General Assembly would give unimpugnable inter-governmental authority to these proposed 'Millennium Goals'. Discussions between Member States on the text eventually led to a long list of goals covering peace, security and disarmament; development and poverty eradication; the environment; human rights, democracy and good governance; protecting the vulnerable; meeting the special needs of Africa; and strengthening the United Nations. The goals went far beyond the DAC/Utstein Group's proposal for prioritized, concrete, monitorable, achievable IDGs.

Following the Millennium Summit, discussions on how to bring the development agenda forward moved to an informal group of like-minded entities, spearheaded by members of the Utstein Group together with the DAC secretariat, individuals from some UN entities, and the Secretary-General's office. This group tasked itself with agreeing a set of goals that would highlight a limited number of commitments in the Millennium Declaration that could be quantified, and for which there were established indicators for which reasonable data existed. The result of this exercise was a framework containing 8 goals, 18 targets, and 48 indicators, which was annexed to a road map on follow-up to

the Millennium Summit released by the Secretary-General in 2001. This list became the authoritative statement of the MDG framework despite the fact that it had not been agreed in the General Assembly or on a truly multilateral basis. In essence, the MDGs had been 'funneled' into existence by a small, informal, but highly influential network. The Goals went on to receive informal endorsement at the UN Conference on International Financing for Development in Monterrey in 2002, and it was there that funding commitments started to be made on the basis of the MDGs.

Against this backdrop, the rapid acceptance of the MDGs as a set of goals shared by all is an interesting phenomenon. The clear consensus that emerged around the framework was one of its greatest strengths, and certainly helped to mobilize resources for development. However the lack of a more inclusive consultation process also arguably led to gaps in knowledge that weakened the scope of the MDGs, and their targets and indicators, from the beginning. For example, a large range of important issues were either ignored or inadequately addressed – including productive employment (and economic aims generally), peace and security, governance and the rule of law. There was also a general lack of understanding at the outset that achieving MDGs at the country level required extensive adaptation to given country contexts – tapping into local knowledge and, above all, keeping those closest to this knowledge in the driving seat.

Ironically, perhaps, one of the MDGs did point the way towards a more broad-based approach. MDG 8, the goal to develop a global partnership for development, aimed to galvanize support – particularly financial support – for the achievement of the MDGs as a whole. However, a number of the targets related to this proposed global partnership for development were defined in an imprecise manner, weakening the likelihood of establishing the networks needed to provide such support (see United Nations, 2011). In the first attempt by the United Nations system to apply lessons learned from the MDGs to a new post-2015 development agenda, one of the most striking recommendations is that, for a global partnership of this type to succeed, it should not be limited to resource mobilization and should be constructed in a much more participatory manner, with more reflection given to the knowledge that resides in a wider range of actors, including governments, civil society, the private sector and foundations (United Nations, 2012).

2. THE NEW KNOWLEDGE PLAYERS: FROM BRICS TO BUSAN

Just as the MDG framework became the dominant paradigm for development cooperation, noticeable changes were emerging in how industrialized and developing countries, or North and South, related to each other. Between 1990 and 2008, world trade expanded fourfold, spurred on by a wave of globalization that saw South-South trade escalate by more than twenty times its initial level. Indeed, despite the ongoing financial and economic crises, South-South relations have continued to be characterized by a noticeable increase in trade and investment (United Nations, A/66/229). The ascendancy of emerging economies from the South, including – but not limited to – the BRICS countries of Brazil, Russia, India, China and South Africa, brings important implications for international approaches to development and multilateral priority-setting.

This is not to claim that the role of the South in development cooperation is a new one. Many developing countries have themselves been engaged for many years in activities to promote economic development and welfare, to provide technical assistance, and to give humanitarian aid (Mawdsley, 2012). As Mawdsley notes, the role of the South as a positive actor in development, even as it has grown, has nevertheless appeared to be somewhat out of the mainstream. One reason for this is that, while traditional donors of the DAC or Utstein school influenced the agenda towards human development, "the (re)emerging partners appear to be re-animating the modernization theories of the 1950s and 1960s, in which economic growth is the primary and prior requirement of 'development'" (Mawdsley, due 2013). Another may quite simply be that these actors are often hesitant to use terms like 'donor' or 'aid' to describe their cooperation and may characterize their actions in different ways.

However described, during the course of the 2000s it became apparent to the traditional donors that there was a need to connect to this new stream of development actors, in part because of their growing conviction that meeting the MDGs would require a much greater degree of donor togetherness. The Paris Declaration, agreed at the OECD/DAC's High-level Forum on Aid Effectiveness (HLF) in 2005, advocated recipient country ownership, donor alignment, in-country harmonization, and mutual accountability for results. This was again a clear

example of an avant-garde action spearheaded by a core group, with the expectation that this would become the dominant paradigm for aid effectiveness. While supported by a range of developing countries, and also agreed to by the United Nations system and regional development banks, the new actors from the South were conspicuously absent in Paris.

Attempts were made to include a wider range of partners at the next HLF, held in Accra in 2008. Developing countries played a more active role in the preparations and agenda, with a number of regional preparatory events hosted and organized by these countries. Civil society was also included in discussions. However, it was the fourth HLF in Busan, Republic of Korea, held in 2011, which proved to be the game changer. The final independent evaluation of the Paris Declaration had been critical of donors for not adequately adhering to the majority of principles (Wood et al, 2011), while other analyses showed that coordination between the traditional donors had even weakened (Nunnenkamp et al, 2011).

Busan echoed commitments made in Paris and Accra, but in a looser way. The emphasis was no longer on the OECD/DAC's driving role – there would now be a new 'Global Partnership for Effective Development Cooperation' which would be inclusive and represent the entire international community. Most notably, Brazil, China and India voluntarily joined in agreeing to the outcome document, a text which brings South-South cooperation and the knowledge and expertise of emerging economies into the heart of development cooperation. The document explicitly recognizes that the Global Partnership must be a multi-speed one, as different types of countries have 'differential commitments' (paragraph 1) and 'the nature, modalities and responsibilities that apply to South-South cooperation differ from those that apply to North-South cooperation' (paragraph 2). Language in the document reaffirmed commitment to economic development and the role of the private sector, while singling out South-South and triangular cooperation as extending 'well beyond financial cooperation to the knowledge and development experience of all actors and countries.' (paragraph 30) Moreover, signatories agreed to encourage 'the development of networks for knowledge exchange, peer learning and coordination among South-South cooperation actors as a means of facilitating access to important knowledge pools by developing countries' (paragraph 31).

How the Global Partnership will operate in practice remains to be seen. After much discussion, a light secretariat has been established, supported by the OECD and the United Nations Development Group, with the aim of improving networking in an increasingly complex world, in which many diverse forces have an impact on development. The Partnership is therefore likely to be a far more inclusive and representational network than its predecessor, a Working Party of the OECD/DAC. However, it is uncertain if it will manage to work effectively, or with sufficient voice for weaker countries. Whatever the case, it is clear that Busan marks a profound shift in the development landscape, with consequences for the future development agenda as well as for how complex and highly varied development actors should coordinate, create and transmit knowledge.

Whether this emerging development architecture will redefine the global aid architecture in a way that will bring "more coherence to the chaos that characterizes international cooperation initiatives", as Severino and Ray (2010) wish for, is another point that remains to be seen. It is without doubt, however, that the next era of globalization will require ever-increasing degrees of international coordination, especially calling for a strengthened United Nations system, due to its catalyst role and universal membership and legitimacy.

Equally, South-South partnerships and regional cooperation are likely to rapidly become more dominant features in the unfolding international development architecture, with network governance structures, based on multi-stakeholder knowledge networks, increasingly gaining key importance in local, regional and global policymaking. In this context, as described in the first Networks for Prosperity report (UNIDO 2011), the role of knowledge networks in processes of regional or inter-regional integration should be emphasized as a mechanism for strengthening the innovation capacities of countries, prerequisites for the achievement of development goals, including inclusive growth and sustainable development.

3. THE CRUCIAL ROLE OF MIDDLE-INCOME COUNTRIES

Since the adoption of the Millennium Declaration and the creation of the MDGs, millions have been lifted out of poverty. The percentage of the world's population living on less than $1.25 a day fell from 42 per cent in 1990 to 25 per cent in 2005, and is projected to fall to 14 per cent by 2015. This impressive success on income poverty is largely due to the increased industrialization and growth of related economic activities in a range of developing countries, and especially China. Indeed, MICs are the fastest growing group of countries, both in terms of population and key economic and human development indicators, today with a share of more than 30 per cent of global manufactured value added. However, progress towards reaching the full range of MDGs, which did not prioritize economic growth as a means of achieving development objectives, remains uneven. One remarkable change in the past two decades has been the shift in location of the world's poor from low-income countries (LICs) to MICs. It is estimated that in 1990 over 90 per cent of the world's poor people lived in LICs, while there is evidence that today almost three-quarters of the world's poor live in MICs. At the same time, the ongoing global financial and economic crises, the food and energy crises, as well as the more recent European sovereign debt crisis, have had a negative effect on world economic growth and continue to pose challenges to development efforts. Therefore, poverty reduction strategies that do not include MICs cannot be successful. They need to be seen in the global context and include economic structural transformation policies, human resource investments and targeted private sector development strategies in MICs.

Also, at the centre of most forward-looking analyses or studies on global development is sustainable development. It is almost axiomatic to say that the ongoing financial and economic crises have been aggravated by negative environmental trends, of which climate change has the most critical consequences. Yet, despite the fact that the concept of sustainable development with its economic, environmental and social pillars was first articulated by the Brundtland Commission as early as 1987, its operationalization as a development paradigm has proven difficult. Indeed, resource efficiency will play an increasingly important role in the context of global stability, security and development. Inefficient technologies and operating practices currently in use by many industries in developing countries will need to be replaced. This is particularly true for MICs with a high degree of employment-creating manufacturing industries. In addition, energy access is one of the most pressing of

all the global challenges and is central to all the three pillars of sustainable development. As the impacts of climate change become clearer, it is increasingly evident that a growing share of humanity will become vulnerable to its effects, which renews the urgency to move towards "green" industry in developing and industrialized countries alike. In the light of the United Nations Conference on Sustainable Development held in Rio de Janeiro in June 2012 (Rio+20), at which Member States agreed to a process to draw up a set of sustainable development goals (SDGs), the opportunity to do so has now arisen. In the Conference outcome document, The Future we Want, Member States recognized that the SDGs need to be coordinated and coherent with related processes to set the post-2015 development agenda. It will be essential that MICs not only participate in the deliberations of these crucial negotiations; their active leadership and commitment will determine how successful and inclusive the emerging development framework will be.

Finally, Recession in many industrialized countries has led to pressure on global official development assistance (ODA) budgets, the total spend for which declined in 2011 for the first time since 1997. On the other hand, MICs are rapidly increasing their own development cooperation and particularly triangular (North-South-South) and South-South cooperation are recognized as potential drivers of future development finance. According to some estimates, South-South cooperation already accounts for about $15 billion in development cooperation each year and could provide over $50 billion by 2025 (Kharas et al, 2012). Some analyses of South-South cooperation spending indicate a firmer emphasis on industry and economic activity generally, compared to the tendency of traditional donors to fund the social, humanitarian and governance sectors (Turner et al, 2012). It is well known that opportunities for the creation, transmission and dissemination of knowledge have transformed industry worldwide, yet there remain significant gaps in access to knowledge by many developing countries, even in upper MICs. Over the past decade it has become evident that the importance of knowledge transfer is equal to, or in some cases exceeds, the importance of technology transfer. Limited access to knowledge hampers progress towards inclusive growth and employment creation, as well as technological progress for sustainable development, and for food, nutrition and energy security. As described in the first Networks for Prosperity report (UNIDO 2011), a major challenge is thus to enhance access to policy-relevant knowledge in sustainable economic development, and to create the space for national, regional and global knowledge streams and networks for policymaking and capacity-building, particularly among MICs.

4. BEYOND 2015: AN ECOSYSTEM OF DEVELOPMENT KNOWLEDGE

The tracks leading to the development agenda beyond 2015 are complex, increasing in number, and quite different to those that led to the MDGs. First, the outcome document of the 2010 High-level Plenary Meeting of the United Nations General Assembly on the progress towards the MDGs requested the Secretary-General to make recommendations to advance the United Nations development agenda beyond 2015. Initial recommendations in this regard were presented in August 2011 in the Report of the Secretary-General on accelerating progress towards the MDGs (United Nations, A/66/126), with special reference to the need for an open and inclusive process of consultations on the agenda. This led to the establishment by the Secretary-General of a system-wide Task Team (UNTT), which was charged with producing a report reviewing the successes and challenges of the MDG process and providing some general options on the way forward for the development agenda (United Nations, 2012).

The UNTT report provides one basis for discussion of a High-level Panel on the Post-2015 Development Agenda (HLP), established by the Secretary-General in June 2012 under the tripartite co-chairmanship of the United Kingdom (Prime Minister Cameron), Liberia (President Johnson Sirleaf), and Indonesia (President Yudhoyono). The HLP has been tasked with producing a major report by May 2013, which is expected to inform discussions among Member States in a High-level Meeting on the MDGs and post-2015 to be held in autumn 2013 at the General Assembly. Further relevant reports will be prepared by the Secretary-General for ECOSOC and for the General Assembly. Consideration of the parameters and detail of the post-2015 development agenda will eventually take place in the General Assembly, most likely during 2014.

In June 2012, the outcome document of the United Nations Conference on Sustainable Development (Rio+20) provided for an Open Working Group (OWG) of 30 Member States to be inaugurated at the beginning of the 67th session of the General Assembly in September 2012 (United Nations, A/66/288). The OWG is tasked with submitting a report to the 68th session of the General Assembly containing a proposal for a set of sustainable development goals (SDGs). According to the outcome document (para 249), the SDG process "needs to be coordinated and coherent with the process leading to the post-2015 development agenda". In order to

provide technical support to this process and to the work of the working group, the Secretary-General was asked to ensure all necessary input and support to this work from the UN system including through the establishment of an inter-agency technical support team (TST, of which UNIDO is a member agency) and expert panels as needed, drawing on all relevant expert advice. Reports on the progress of work will be made regularly to the General Assembly.

In addition to the above, there are a range of formal and informal processes, publications and events that are seeking to influence the agenda beyond 2015, many of which are taking place at the country level. From the side of the United Nations, there is a determination to make sure that accusations of lack of inclusiveness cannot be levelled this time. However, this is tempered by the experience of how the actionable MDGs, whatever their faults, were derived from a more exclusive process than that which led to the Millennium Declaration. One potential solution to this conundrum is to recognize and embrace the multi-polarity of the development landscape, building an ecosystem of decentralized and flexible networks for development knowledge and development results. In essence, this means building the post-2015 agenda around an improved version of the maligned MDG 8, instead of merely viewing partnership as supportive of other goals.

Although the MDG conception of a global partnership was framed as incentivizing stakeholders in all countries, the subtext was mostly about a compact between the industrialized North (through official development assistance (ODA), debt relief, extensions to market access, and established private sector entities making technologies more accessible) and a poor South. This framing is increasingly losing its relevance as the lines between country typologies blur, and new modes of cooperation become more important. Southern-led or triangular development initiatives, knowledge exchange activities and partnerships to address poverty and other socio-economic issues can become a determining feature of the international development architecture in a multi-polar world.

There are already some clear instances of how the international community is using networks to deal with complex facets of the post-2015 agenda. The decision by the United Nations Secretary-General and the President of the World Bank to further a global initiative on Sustainable Energy for All through establishing a 'network of networks', building on expertise residing in the public sector, private sector, civil society and academia, is one such example. Similarly, UNIDO's Green Industry initiative is built on the recognition that the future of industrial governance will be of a multi-sector and action-oriented nature.

In view of the importance of knowledge networking and the potential to make knowledge exchange a defining pillar for the implementation of any post-2015 development strategy, some of the most successful networks appear to be those addressing regional or global issues through cross-border, peer-to-peer knowledge sharing and multi-stakeholder governance. This second Networks for Prosperity report aims to contribute to this development with new empirical findings on the importance of domestic and international connectedness for achieving development objectives, academic think pieces on various aspects of knowledge networking, and examples for good network governance from around the world.

PART 2:
Measuring Connectedness and its Impact

◄ *The idea of networks,*
particularly knowledge networks,
demands further quantitative
conceptualization and
methodological validation but
hold great exploratory and
explanatory value

Introduction

The intricacies of knowledge networks present a variety of innovative mechanisms for alleviating or circumventing typical barriers to industrial development. But at first glance, networks are abstract and nebulous in nature, differing greatly from traditional governance structures easily identified by a parliament, head of state or an administration.

This in mind, a sound understanding of network characteristics is necessary for understanding the true potential of knowledge networks to impact development goals. A thoroughly conceptualized concept of networks allows a deeper delve into understand the variety of networks, their magnitude, and how, specifically, they can impact private sector development and overall economic growth.

Noting a marked gap in academic literature, contributions in this section set forth two distinct measurements of networks. Both highlight connectedness, or the degree to which a country is networked. Measuring how well a country is connected can indicate whether networks are indeed contributing factors for development. Rankings are generated that list the countries from most connected to least connected.

The first Network for Prosperity report provided the first contribution to constructing a measure which aims to capture the degree to which countries are networked, both internally as well as externally. The key effort last year was to identify the information necessary to quantitatively capture the importance of networks. In this year's report, results are updated and compared with the Ghemawat Index. The UNIDO Connectedness Index identifies three distinct levels of networks (international, inter-

organizational, and intra-organizational) and incorporates relevant economic and political variable to construct a connectedness ranking across the three identified levels.

A second contribution comes from researchers at the European University Institute in Florence. In contrast to the first contribution, efforts here target the measurement of networks' impact on economic growth. The authors focus on the causal relationship between networks, utilizing bilateral trade and economic data to measure a state's connectedness via a measure of trade integration.

Taken together, these contributions offer nuanced approaches to measuring networks. The differences in methodologies and data used in the two measurements (as well as in the Ghemawat Connectedness Index which is extensively discussed in the first contribution) indicate that the idea of networks, particularly knowledge networks, demands further quantitative conceptualization and methodological validation but hold great exploratory and explanatory value. These quantitative endeavours exploring how to describe a country's connectedness sets the stage for contributions further on in the report that explore specific countries' and NGOs ' experiences with networks and as well as contribution that highlight the complexities of networks.

2.1
Connectedness Index 2012
Axel Marx, Jadir Soares and Colleen Carroll

INTRODUCTION

Networks surfaced as a new buzzword in the late 1980s and early 1990s. Researchers responding to shifting world orders and new definitions of state power sought a term capable of capturing the increasing number of actors- both governmental and civil-society based- participating in policy formation on distinct levels of policymaking (Rhodes, 2012). Although the importance of networks is recognized in the academic literature, limited data availability complicates both measuring networks on the country level and understanding the relationship between relevant outcome parameters such as government effectiveness, industrial development and GDP per capita (Marx et al, 2011). To date, few studies that cover a large set of countries provide a measure to compare the degree to which countries are networked. A first attempt was made in the first Networks for Prosperity Report; the Connectedness Index launched within the Report measures country networks on distinct levels: international, inter-organizational and intra-organizational (for a further discussion see Marx et al. 2011).

This chapter provides an update of the Connectedness Index and presents the results for 2012. In order to facilitate the comparison, the same methodology as previous year is used, allowing us to capture the progress countries are achieving in establishing and maintaining their networks. In the next sub-section, the different components of the Connectedness Index are presented. Next, the results from the Connectedness sub-indices are introduced. Then, the overall Connectedness Index 2012 is presented and the results are compared with the 2011 Connectedness Index. The relationship between the Connectedness Index and relevant development measures is discussed and lastly, the UNIDO's 2012 Connectedness Index is compared with the

Ghemawat Global Connectedness Index 2011, another connectedness measure also launched in 2011. This facilitates a comparison of connectedness measurements that originate from different conceptualizations. The chapter ends with a conclusion.

THE CONNECTEDNESS INDEX: MULTI-LEVEL MEASUREMENT OF NETWORKS ACROSS COUNTRIES

The UNIDO Connectedness Index is an exploratory attempt to measure the degree to which a country is 'networked' or connected. It takes into account that networks develop and are influential on three distinct levels: the international, the inter-organizational, and the intra-organizational level. The first attempt to capture the level of connectivity of a country was developed and published in the 2011 Networks for Prosperity Report. This report gathers the most recent data available to measure developments in countries' networks. Methodology used in the first report is maintained in the 2012 edition in order to keep measures comparable between the two reports. Figure 2.1 presents the seven variables selected to construct the connectedness index. For international networks, the aim is to identify indicators that capture the flows of information and policy diffusion between public authorities, as well as the information flows between economic actors (Slaughter, 2004; Martínez-Diaz &Woods, 2009). Two indicators are incorporated to capture this degree of international connectedness, namely the KOF (Swiss Economic Institute) political globalization indicator and the KOF economic networks indicator. The political globalization index captures inter alia the membership in international inter-governmental organizations and the number of international
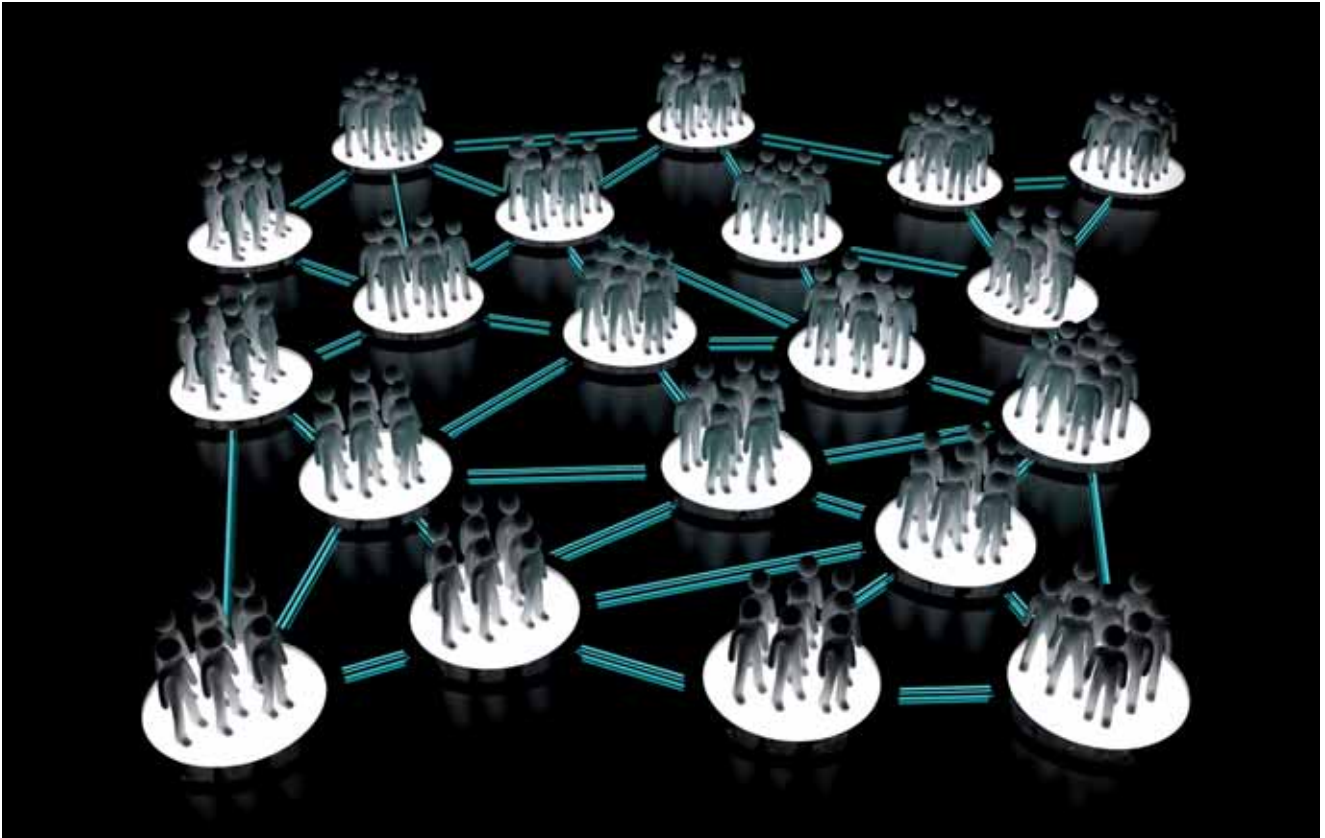
To capture the degree of inter-organizational interconnectedness within a country, three variables are considered: university-industry collaboration; networks and supporting industries; and the degree to which individuals are members of professional organizations.

treaties signed and ratified by a country. The economic networks indicator measures the actual economic and financial flows between countries (trade, FDI, portfolio investments). Several other economic indicators capture economic flows, but the KOF is the most comprehensive and suitable one for the purpose of this report.

To capture the degree of inter-organizational interconnectedness within a country, three variables are included: university-industry collaboration; networks and supporting industries; and the degree to which individuals are members of professional organizations, which are often established for networking purposes. The first two indicators are drawn from the Global Competitiveness Report. University industry collaboration measures the extent to which business and research professionals collaborate on research and development. This relationship forms a network between the private and academic sectors as they work together to pursue innovations. Networks and supporting industries capture the number and quality of local suppliers and the extent of their interaction (i.e. clusters, or the concentration of interconnected businesses). Literature on inter-organizational networks and economic geography recognizes both factors as important indicators to capture the degree of

connectedness between these organizations. (Podolny & Page, 1998; Powell & Smith-Doerr, 1994; Saxenian et al. 2001; European Commission, 2008) The third indicator is drawn from the World Values Survey and aims to account for networks of professionals that collaborate with each other for specific purposes. Networking in the context of professional association can be regarded as a relevant networking strategy in the context of information exchange (see Burt, 1995; Baker, 2002; Putnam, 2000 for a more general argument on the importance of association).

Intra-organizational networks are more difficult to measure. To do so, two proxies are identified based on the degree to which firms offer training (Cross & Parker, 2004). The idea is that training enhances internal networks and learning resulting from increased interaction between people within an organization. One measure comes from the World Bank Enterprise Surveys and measures the percentages of firms offering formal training. A second measure is based on the Global Competitiveness report; it accounts for local availability of specialized research and training services to measure on-the-job training in a country and the extent to which companies in a country invest in training and employee development.

To analyze the relationship with relevant outcome variables, the report focuses on four variables, namely two policy-related variables (government effectiveness and regulatory quality) and two economy-related variables (industrial development and GDP per capita). Government effectiveness and regulatory quality are chosen since networks are assumed to contribute to better policy formulation and implementation (see Marx et al. 2011). In turn, these variables are important for better private sector development and economic development, the ultimate parameters in which we are interested (see also Altenburg (2011, pp. 35-36)). Government effectiveness, from the World Bank governance indicators series, captures different aspects of policymaking and implementation, including the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such

Figure 2.1: Connectedness Index
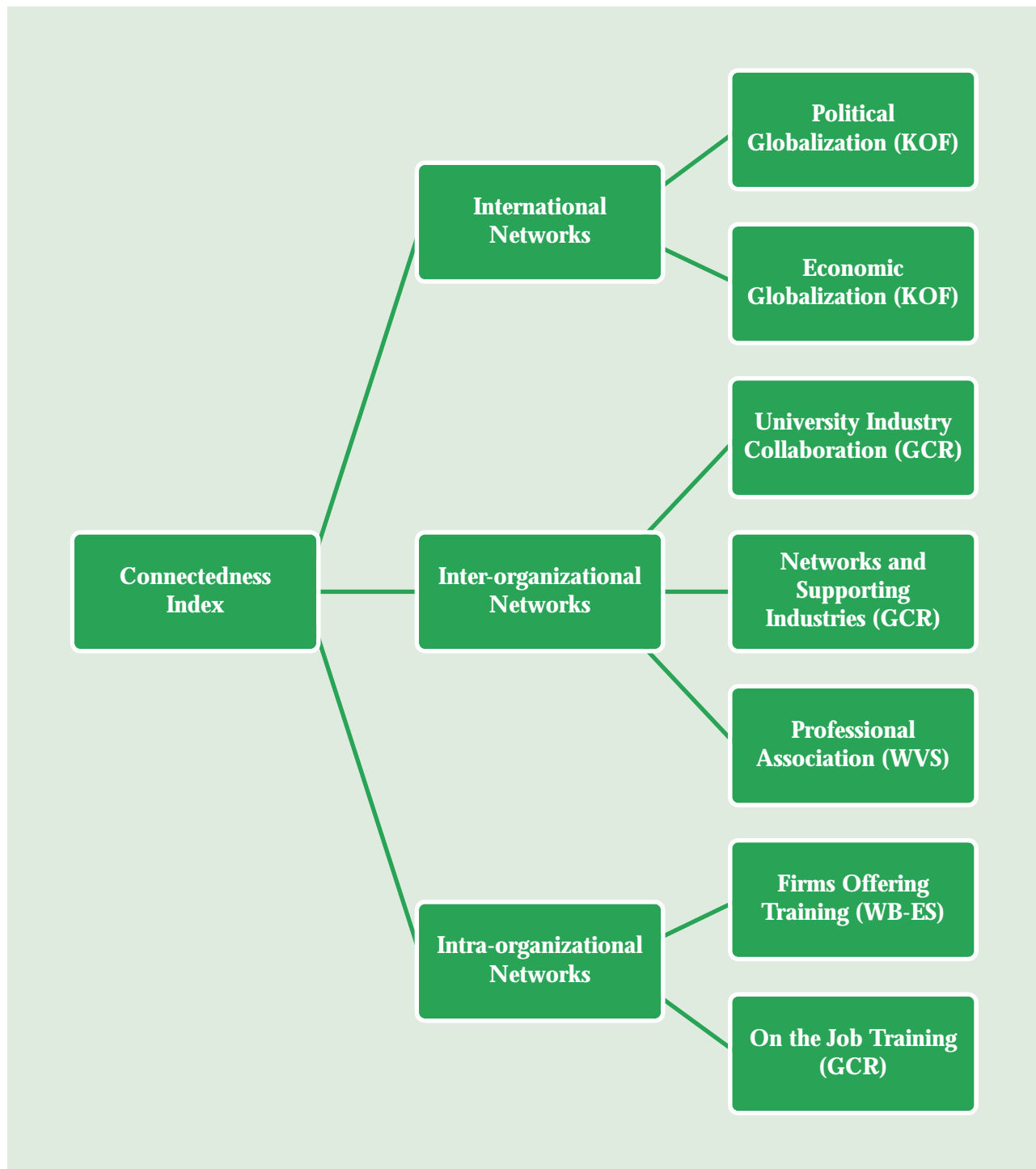
policies. The link with private sector development is specifically made in the concept of regulatory quality – data for which was also retrieved from the World Bank governance indicators series –, which refers to the ability of governments to formulate and implement sound policies and regulations that permit and promote private sector development (Kaufman et al. 2009). The UNIDO Competitive Industrial Performance (CIP) Index benchmarks competitive industrial activity at the country level and is an indicator for industrial development. The World Development Indicators provides data on GDP per capita, a second general measure for economic development.

The analysis that follows has a dual focus: first, it analyzes the variation in the connectedness index and its sub-indices; second, it analyzes the relationship between other relevant parameters such as policy effectiveness, industrial development and economic development, without implying any causal relationship. As explained in the first Networks for Prosperity report this analysis only serves to identify co-variation and does not claim any causal relations. Table 2.1 below presents the variables used to compose the connectedness index as well as the indicators we have related to connectedness.

The following sections discuss the different sub-indices, the Connectedness Index, and the Connectedness Index's relationship with relevant other variables, government effectiveness, CIP and GDP per capita.

Table 2.1: Components of connectedness

Variable	Source	Source variable
Political Networks	KOF Index of Globalization	Political Globalization
Economic Networks	KOF Index of Globalization	Actual flows in economic terms
University-Firm Networks	Global Competitiveness Report	University-industry collaboration in R&D
Inter-firm Networks	Global Competitiveness Report	Networks and supporting industries
Personal Networks	World Values Survey	A072: Member of professional associations or A104: Active/inactive membership of professional organization
Formal Training	Enterprise Surveys	L.10: Over fiscal year … [last complete fiscal year], did this establishment have formal training programs for its permanent, full-time employees?
On-the-job Training	Global Competitiveness Report	On-the-job training
Government Effectiveness	Worldwide Governance Indicators	Government effectiveness
Regulatory Quality	Worldwide Governance Indicators	Regulatory quality
Competitive Industrial Performance (CIP)	Industrial Development Report	Competitive industrial performance
GDP per capita	World Development Indicators	GDP per capita, PPP (current international $)

International Networks Sub-index

The International Networks sub-index is based on two indicators from the KOF Index of Globalization, political and economic globalization.

Political globalization is a proxy for the degree to which states are networked on an international level. This indicator is based on the number of embassies in a country, the number of international organizations of which a country is a member, the number of UN peace missions in which a country participated, and the number of international treaties a country signed (Dreher, 2006). The proxy for economic globalization (networks) is based on the flows of goods and services (KOF actual flows). This indicator takes into account the exports and imports of goods and services, foreign direct investments (FDI stocks), the portfolio of investments of a country, and income payments to foreign nationals.

To create the International Networks Sub-index, we calculate the arithmetic mean of political and economic networks, transformed on a scale from 0-1. The sub-index of International Networks includes data for 208 countries; it is presented in table 2.2.

Table 2.2: International Networks Sub-index

ISO	Country	2012 International Network Index	2012 International Network Rank
BEL	Belgium	1.000	1
IRL	Ireland	0.973	2
NLD	Netherlands	0.960	3
HUN	Hungary	0.947	4
CHE	Switzerland	0.938	5
AUT	Austria	0.933	6
SWE	Sweden	0.930	7
LUX	Luxembourg	0.918	8
DNK	Denmark	0.894	9
CZE	Czech Republic	0.875	10
MYS	Malaysia	0.871	11
SGP	Singapore	0.868	12
PRT	Portugal	0.865	13
NOR	Norway	0.854	14
CHL	Chile	0.844	15
CYP	Cyprus	0.835	16

ESP	Spain	0.833	17
FIN	Finland	0.817	18
SVK	Slovakia	0.817	19
ISL	Iceland	0.808	20
POL	Poland	0.807	21
CAN	Canada	0.790	22
AUS	Australia	0.785	23
EST	Estonia	0.784	24
BGR	Bulgaria	0.782	25
ITA	Italy	0.776	26
THA	Thailand	0.763	27
NGA	Nigeria	0.761	28
UKR	Ukraine	0.758	29
SVN	Slovenia	0.757	30
GBR	United Kingdom	0.755	31
HRV	Croatia	0.749	32
GRC	Greece	0.743	33
COG	Congo	0.740	34
PAN	Panama	0.737	35
TUN	Tunisia	0.733	36
ISR	Israel	0.733	37
NZL	New Zealand	0.726	38
MLT	Malta	0.718	39
FRA	France	0.717	40
JOR	Jordan	0.716	41
ZAF	South Africa	0.709	42
KAZ	Kazakhstan	0.699	43
DEU	Germany	0.699	44
RUS	Russian Federation	0.697	45
PER	Peru	0.695	46
KOR	Korea, Republic of	0.688	47
JAM	Jamaica	0.687	48
BHR	Bahrain	0.674	49
MNG	Mongolia	0.673	50
URY	Uruguay	0.667	51
LBR	Liberia	0.663	52
ROU	Romania	0.660	53
ZWE	Zimbabwe	0.657	54
ARG	Argentina	0.654	55
GAB	Gabon	0.651	56
BRA	Brazil	0.646	57
MAR	Morocco	0.636	58
NAM	Namibia	0.630	59
PHL	Philippines	0.626	60
SRB	Serbia	0.625	61
TUR	Turkey	0.623	62
LBY	Libya	0.621	63
QAT	Qatar	0.617	64
BOL	Bolivia, Plurinational State of	0.611	65
HND	Honduras	0.610	66
LBN	Lebanon	0.606	67

DZA	Algeria	0.605	68
ZMB	Zambia	0.603	69
EGY	Egypt	0.603	70
COL	Colombia	0.599	71
CUB	Cuba	0.599	72
KGZ	Kyrgyzstan	0.599	73
BLZ	Belize	0.594	74
IDN	Indonesia	0.594	75
GRD	Grenada	0.588	76
SLV	El Salvador	0.588	77
MRT	Mauritania	0.587	78
SEN	Senegal	0.583	79
BRB	Barbados	0.582	80
TTO	Trinidad and Tobago	0.581	81
TGO	Togo	0.581	82
GHA	Ghana	0.578	83
ALB	Albania	0.574	84
COD	Congo, Democratic Republic of the	0.572	85
VNM	Viet Nam	0.570	86
GIN	Guinea	0.570	87
MNE	Montenegro	0.569	88
SYC	Seychelles	0.565	89
FJI	Fiji	0.562	90
USA	United States	0.559	91
IND	India	0.553	92
ECU	Ecuador	0.549	93
PRY	Paraguay	0.548	94
MEX	Mexico	0.544	95
AGO	Angola	0.543	96
KHM	Cambodia	0.543	97
GMB	Gambia	0.542	98
GTM	Guatemala	0.541	99
CHN	China	0.531	100
MLI	Mali	0.530	101
CRI	Costa Rica	0.527	102
BIH	Bosnia and Herzegovina	0.521	103
GNQ	Equatorial Guinea	0.520	104
MOZ	Mozambique	0.518	105
SWZ	Swaziland	0.514	106
MDG	Madagascar	0.509	107
PNG	Papua New Guinea	0.509	108
LTU	Lithuania	0.506	109
LCA	Saint Lucia	0.505	110
VUT	Vanuatu	0.504	111
BRN	Brunei Darussalam	0.503	112
MDA	Moldova	0.502	113
OMN	Oman	0.501	114
AZE	Azerbaijan	0.496	115
TCD	Chad	0.495	116
PAK	Pakistan	0.490	117
GUY	Guyana	0.487	118

BWA	Botswana	0.486	119
GEO	Georgia	0.484	120
ARE	United Arab Emirates	0.483	121
MCO	Monaco	0.482	122
KWT	Kuwait	0.479	123
CIV	Côte d'Ivoire	0.478	124
YEM	Yemen	0.473	125
CMR	Cameroon	0.466	126
BHS	Bahamas	0.463	127
MUS	Mauritius	0.462	128
UGA	Uganda	0.460	129
SAU	Saudi Arabia	0.457	130
LIE	Liechtenstein	0.449	131
ATG	Antigua and Barbuda	0.448	132
DJI	Djibouti	0.444	133
DOM	Dominican Republic	0.439	134
GNB	Guinea-Bissau	0.437	135
MKD	Macedonia, the former Yugoslav Republic of	0.433	136
LVA	Latvia	0.427	137
UZB	Uzbekistan	0.426	138
NIC	Nicaragua	0.425	139
NER	Niger	0.420	140
KEN	Kenya	0.417	141
JPN	Japan	0.415	142
DMA	Dominica	0.409	143
WSM	Samoa	0.403	144
ARM	Armenia	0.401	145
KNA	Saint Kitts and Nevis	0.401	146
LSO	Lesotho	0.401	147
IRQ	Iraq	0.400	148
MMR	Myanmar	0.392	149
VEN	Venezuela, Bolivarian Republic of	0.392	150
BEN	Benin	0.387	151
LKA	Sri Lanka	0.385	152
SMR	San Marino	0.383	153
TKM	Turkmenistan	0.379	154
BGD	Bangladesh	0.372	155
STP	Sao Tome and Principe	0.366	156
TJK	Tajikistan	0.362	157
SLB	Solomon Islands	0.361	158
VCT	Saint Vincent and the Grenadines	0.358	159
ETH	Ethiopia	0.357	160
BFA	Burkina Faso	0.356	161
SLE	Sierra Leone	0.351	162
CAF	Central African Republic	0.344	163
SDN	Sudan	0.343	164
MWI	Malawi	0.338	165
MAC	Macao	0.336	166
CPV	Cape Verde	0.334	167
TMP	East Timor	0.328	168
BLR	Belarus	0.328	169

ABW	Aruba	0.328	170
SYR	Syrian Arab Republic	0.323	171
TZA	Tanzania, United Republic of	0.311	172
AND	Andorra	0.307	173
PLW	Palau	0.301	174
SOM	Somalia	0.289	175
IRN	Iran, Islamic Republic of	0.285	176
RWA	Rwanda	0.271	177
FRO	Faroe Islands	0.243	178
IMN	Isle of Man	0.226	179
JEY	Jersey	0.224	180
LAO	Lao People's Democratic Republic	0.215	181
ANT	Netherlands Antilles	0.212	182
PRK	Korea, Democratic People's Republic of	0.209	183
AFG	Afghanistan	0.208	184
BDI	Burundi	0.202	185
CYM	Cayman Islands	0.201	186
PRI	Puerto Rico	0.201	186
MDV	Maldives	0.198	188
NPL	Nepal	0.197	189
TON	Tonga	0.196	190
NCL	New Caledonia	0.192	191
VIR	Virgin Islands, U.S.	0.188	192
KIR	Kiribati	0.182	193
WBG	West Bank and Gaza Strip	0.171	194
MHL	Marshall Islands	0.168	195
BTN	Bhutan	0.126	196
FSM	Micronesia, Federated States of	0.121	197
COM	Comoros	0.110	198
ERI	Eritrea	0.092	199
BMU	Bermuda	0.080	200
HTI	Haiti	0.079	201
GRL	Greenland	0.071	202
PYF	French Polynesia	0.066	203
ASM	American Samoa	0.062	204
GUM	Guam	0.053	205
MNP	Northern Mariana Islands	0.046	206
SUR	Suriname	0.012	207
MYT	Mayotte	0.000	208
	Median:	0.519	

The international sub-index shows significant variation in the degree to which countries are linked to each other on the international level, both politically as well as economically. Belgium tops the list, followed by Ireland, The Netherlands and Hungary. Comparing each country to the median score (0.519) indicates that the majority of countries achieve relatively high scores on the sub index.

However, several countries also receive low scores, lying outside the international dynamics between countries. It should be noted that a score of zero does not imply that a country is totally unconnected, but that – given the variation between countries and the re-scaling of the variables necessary for indexing (see annex 1) - a country with a zero score indicates that international connectedness is very low compared to other countries.

Inter-organizational Networks Sub-index

The Inter-organizational Networks Sub-index was created based on three indicators.

First is the indicator on networks and supporting industries, which is constructed using data from the Global Competitiveness Report's (2009-2010) Executive Opinion Survey.

It takes into account the quality and quantity of local suppliers and the state of cluster development. The University-Industry Collaboration indicator is also taken from the Global Competitiveness Report, measuring the extent to which business and universities collaborate on research and development

(R&D) in a country. Finally, the professional association indicator captures the degree to which individuals are involved in professional associations. Data for this measure is gleaned from the World Values Survey.

The Inter-organizational Networks Sub-index is constructed by calculating the arithmetic mean of the three indicators; this value is then transformed to a scale from 0-1. The Inter-organizational Networks sub-index, covering 134 countries, is presented in table 2.3.

Table 2.3: Inter-organizational Networks Index

ISO	Country	2012 Inter-organizational Network Index	2012 Inter-organizational Network Rank
USA	United States	1.000	1
CHE	Switzerland	0.993	2
CAN	Canada	0.881	3
SWE	Sweden	0.880	4
GBR	United Kingdom	0.850	5
FIN	Finland	0.846	6
DNK	Denmark	0.828	7
DEU	Germany	0.824	8
IND	India	0.813	9
JPN	Japan	0.801	10
BEL	Belgium	0.795	11
TWN	Taiwan, Province of China	0.791	12
NOR	Norway	0.781	13
AUS	Australia	0.777	14
NLD	Netherlands	0.775	15
AUT	Austria	0.774	16

SGP	Singapore	0.773	17
IRL	Ireland	0.706	18
NZL	New Zealand	0.702	19
ZAF	South Africa	0.657	20
ISL	Iceland	0.655	21
ARM	Armenia	0.646	22
MYS	Malaysia	0.633	23
KOR	Korea, Republic of	0.623	24
HKG	Hong Kong SAR, China	0.616	25
CHN	China	0.615	26
CZE	Czech Republic	0.614	27
LUX	Luxembourg	0.611	28
QAT	Qatar	0.581	29
IDN	Indonesia	0.579	30
BRA	Brazil	0.577	31
PRI	Puerto Rico	0.577	32
ARE	United Arab Emirates	0.575	33
THA	Thailand	0.566	34
FRA	France	0.565	35
SVN	Slovenia	0.556	36
ISR	Israel	0.546	37
ITA	Italy	0.533	38
CHL	Chile	0.532	39
KEN	Kenya	0.520	40
LKA	Sri Lanka	0.519	41
CRI	Costa Rica	0.515	42
CYP	Cyprus	0.505	43
BRB	Barbados	0.499	44
ESP	Spain	0.487	45
PRT	Portugal	0.484	46
DOM	Dominican Republic	0.475	47
COL	Colombia	0.466	48
SAU	Saudi Arabia	0.463	49
EST	Estonia	0.454	50
HUN	Hungary	0.454	51
MEX	Mexico	0.443	52
OMN	Oman	0.428	53
VNM	Viet Nam	0.428	54
SEN	Senegal	0.426	55
GTM	Guatemala	0.419	56
TUN	Tunisia	0.413	57
TTO	Trinidad and Tobago	0.405	58
ZMB	Zambia	0.403	59
MLT	Malta	0.399	60
LTU	Lithuania	0.391	61
GMB	Gambia	0.387	62
MUS	Mauritius	0.379	63
JAM	Jamaica	0.376	64
ARG	Argentina	0.365	65
TUR	Turkey	0.365	66
KWT	Kuwait	0.362	67

POL	Poland	0.360	68
SVK	Slovakia	0.360	69
JOR	Jordan	0.356	70
PAN	Panama	0.354	71
BRN	Brunei Darussalam	0.353	72
MLI	Mali	0.342	73
HRV	Croatia	0.342	74
TZA	Tanzania, United Republic of	0.340	75
MWI	Malawi	0.333	76
BHR	Bahrain	0.331	77
BWA	Botswana	0.326	78
RUS	Russian Federation	0.324	79
MNE	Montenegro	0.316	80
GRC	Greece	0.316	81
UGA	Uganda	0.307	82
PER	Peru	0.296	83
NAM	Namibia	0.294	84
EGY	Egypt	0.293	85
SLV	El Salvador	0.293	86
UKR	Ukraine	0.289	87
MDG	Madagascar	0.288	88
AZE	Azerbaijan	0.286	89
PHL	Philippines	0.285	90
NGA	Nigeria	0.282	91
BDI	Burundi	0.280	92
URY	Uruguay	0.274	93
MKD	Macedonia, the former Yugoslav Republic of	0.271	94
MOZ	Mozambique	0.271	95
KAZ	Kazakhstan	0.265	96
LVA	Latvia	0.265	97
ROU	Romania	0.254	98
PAK	Pakistan	0.244	99
SRB	Serbia	0.242	100
LSO	Lesotho	0.240	101
HND	Honduras	0.240	102
BGD	Bangladesh	0.239	103
ETH	Ethiopia	0.236	104
BGR	Bulgaria	0.235	105
BFA	Burkina Faso	0.233	106
KHM	Cambodia	0.231	107
CMR	Cameroon	0.229	108
GHA	Ghana	0.228	109
MAR	Morocco	0.220	110
CIV	Côte d'Ivoire	0.218	111
BEN	Benin	0.204	112
LBY	Libya	0.199	113
SUR	Suriname	0.193	114
GUY	Guyana	0.187	115
SYR	Syrian Arab Republic	0.185	116
NPL	Nepal	0.182	117
NIC	Nicaragua	0.175	118

TJK	Tajikistan	0.171	119
MRT	Mauritania	0.159	120
MNG	Mongolia	0.155	121
TCD	Chad	0.155	122
VEN	Venezuela, Bolivarian Republic of	0.141	123
ZWE	Zimbabwe	0.121	124
ECU	Ecuador	0.117	125
DZA	Algeria	0.116	126
BIH	Bosnia and Herzegovina	0.082	127
PRY	Paraguay	0.082	128
BOL	Bolivia, Plurinational State of	0.063	129
ALB	Albania	0.060	130
KGZ	Kyrgyzstan	0.054	131
TMP	East Timor	0.048	132
GEO	Georgia	0.044	133
MDA	Moldova	0.000	134
	Median:	0.361	

The inter-organizational sub-index also varies significantly between countries. Here, the United States is the most connected country, followed by Switzerland, Canada and Sweden. Among developing countries, India is the most connected, holding the 9th position in this list.

Like the international sub-index, the Inter-firm networks (clusters), firm-university networks and personal networks show a marked degree of variation in countries highly connected and those that are less developed connections. The median score of inter-organizational interconnectedness is below 0.5, indicating that a significant number of countries have less developed inter-organizational networks as operationalized in the inter-organizational network sub-index. In our sample, the low median score partly reflects the low level of personal networks measured by the professional association indicator. It should be stressed that this is only a very partial operationalization on the basis of available data and it does not take into account several other elements that could be important in terms of inter-organizational networks (i.e. the links between other actors of the private sector development eco-system are not included in the sub-index). Again, the zero score does not indicate a complete absence of inter-organizational networks, but is a result of the re-scaling method, indicating a comparatively low level of inter-organizational connectedness.

Intra-organizational Networks Sub-index

Two indicators form the basis for the Intra-organizational Networks Sub-index.

Data measuring the percentage of firms offering formal training comes from the World Bank Enterprise Surveys, most specifically from the question L10, assessing whether an establishment offers formal training programmes.

The on-the-job training indicator culls data from the Global Competitiveness Report 2009-2010 and is based on the local availability of specialized research

and training services and the extent to which companies invest in training and employee development.

Like the International and Inter-organizational sub-indices, the Intra-organizational Networks sub-index is built by using the arithmetic mean of the two training indicators. The index, covering 167 countries, is presented in table 2.4.

Table 2.4: Intra-organizational Networks Index

ISO	Country	2012 Intra-organizational Network Index	2012 Intra-organizational Network Rank
CHE	Switzerland	1.000	1
WSM	Samoa	1.000	1
DNK	Denmark	0.936	3
SWE	Sweden	0.936	3
USA	United States	0.900	5
FIN	Finland	0.884	6
NLD	Netherlands	0.884	6
SGP	Singapore	0.871	8
JPN	Japan	0.846	9
NOR	Norway	0.820	10
CAN	Canada	0.794	11
FRA	France	0.791	12
IRL	Ireland	0.786	13
CZE	Czech Republic	0.785	14
BEL	Belgium	0.781	15
FJI	Fiji	0.754	16

GBR	United Kingdom	0.749	17
AUT	Austria	0.746	18
ISL	Iceland	0.723	19
EST	Estonia	0.721	20
AUS	Australia	0.711	21
LUX	Luxembourg	0.695	22
NZL	New Zealand	0.675	23
THA	Thailand	0.670	24
HKG	Hong Kong	0.662	25
TWN	Taiwan, Province of China	0.659	26
PRI	Puerto Rico	0.653	27
DEU	Germany	0.645	28
LBN	Lebanon	0.637	29
ARE	United Arab Emirates	0.637	30
POL	Poland	0.629	31
MYS	Malaysia	0.628	32
SWZ	Swaziland	0.618	33
BRA	Brazil	0.584	34
ISR	Israel	0.576	35
TUN	Tunisia	0.576	35
VUT	Vanuatu	0.570	37
CRI	Costa Rica	0.567	38
GRD	Grenada	0.553	39
SVN	Slovenia	0.552	40
ESP	Spain	0.551	41
CHL	Chile	0.543	42
QAT	Qatar	0.534	43
BLR	Belarus	0.528	44
DOM	Dominican Republic	0.525	45
KOR	Korea, Republic of	0.519	46
CYP	Cyprus	0.518	47
SAU	Saudi Arabia	0.511	48
ZAF	South Africa	0.510	49
PER	Peru	0.498	50
GUY	Guyana	0.493	51
LTU	Lithuania	0.492	52
SLV	El Salvador	0.491	53
ARG	Argentina	0.490	54
KEN	Kenya	0.469	55
RUS	Russian Federation	0.465	56
CHN	China	0.460	57
ECU	Ecuador	0.453	58
PAN	Panama	0.444	59
COG	Congo	0.434	60
LVA	Latvia	0.434	61
VNM	Viet Nam	0.430	62
BHS	Bahamas	0.429	63
BRB	Barbados	0.429	64
MLT	Malta	0.428	65
LKA	Sri Lanka	0.424	66
MWI	Malawi	0.420	67

SVK	Slovakia	0.410	68
KAZ	Kazakhstan	0.396	69
PRT	Portugal	0.396	70
KHM	Cambodia	0.393	71
BIH	Bosnia and Herzegovina	0.390	72
MNG	Mongolia	0.383	73
COL	Colombia	0.380	74
LSO	Lesotho	0.378	75
NAM	Namibia	0.377	76
BOL	Bolivia, Plurinational State of	0.375	77
PHL	Philippines	0.373	78
NER	Niger	0.361	79
GTM	Guatemala	0.356	80
IND	India	0.352	81
TTO	Trinidad and Tobago	0.350	82
TGO	Togo	0.346	83
JOR	Jordan	0.345	84
GAB	Gabon	0.345	85
BHR	Bahrain	0.344	86
VEN	Venezuela, Bolivarian Republic of	0.343	87
GMB	Gambia	0.336	88
BWA	Botswana	0.326	89
TZA	Tanzania, United Republic of	0.325	90
ROU	Romania	0.324	91
MNE	Montenegro	0.322	92
KWT	Kuwait	0.322	93
OMN	Oman	0.318	94
JAM	Jamaica	0.315	95
UGA	Uganda	0.314	96
MEX	Mexico	0.313	97
MUS	Mauritius	0.308	98
HND	Honduras	0.308	99
HRV	Croatia	0.307	100
TUR	Turkey	0.306	101
ITA	Italy	0.305	102
TMP	East Timor	0.300	103
RWA	Rwanda	0.300	104
URY	Uruguay	0.294	105
CIV	Côte d'Ivoire	0.291	106
GHA	Ghana	0.290	107
SRB	Serbia	0.288	108
NGA	Nigeria	0.287	109
WBG	West Bank and Gaza Strip	0.285	110
SYR	Syrian Arab Republic	0.281	111
ERI	Eritrea	0.279	112
BRN	Brunei Darussalam	0.277	113
BEN	Benin	0.273	114
AZE	Azerbaijan	0.270	115
PRY	Paraguay	0.270	116
ETH	Ethiopia	0.269	117
MAR	Morocco	0.265	118

BGR	Bulgaria	0.264	119
ATG	Antigua and Barbuda	0.263	120
KOS	Kosovo	0.259	121
TCD	Chad	0.259	122
UKR	Ukraine	0.258	123
MDG	Madagascar	0.254	124
ZMB	Zambia	0.253	125
SEN	Senegal	0.250	126
IDN	Indonesia	0.250	127
HUN	Hungary	0.243	128
NIC	Nicaragua	0.242	129
BTN	Bhutan	0.241	130
EGY	Egypt	0.237	131
ZWE	Zimbabwe	0.228	132
MDA	Moldova	0.227	133
CMR	Cameroon	0.227	134
KGZ	Kyrgyzstan	0.224	135
GRC	Greece	0.224	136
ARM	Armenia	0.217	137
GIN	Guinea	0.211	138
ALB	Albania	0.210	139
BFA	Burkina Faso	0.205	140
MOZ	Mozambique	0.190	141
AGO	Angola	0.188	142
MKD	Macedonia, the former Yugoslav Republic of	0.184	143
DMA	Dominica	0.182	144
SLE	Sierra Leone	0.177	145
MLI	Mali	0.168	146
LBY	Libya	0.158	147
LBR	Liberia	0.156	148
CPV	Cape Verde	0.150	149
FSM	Micronesia, Federated States of	0.146	150
MRT	Mauritania	0.142	151
GEO	Georgia	0.141	152
BDI	Burundi	0.137	153
TJK	Tajikistan	0.130	154
AFG	Afghanistan	0.123	155
BLZ	Belize	0.120	156
DZA	Algeria	0.120	157
YEM	Yemen	0.100	158
GNB	Guinea-Bissau	0.093	159
PAK	Pakistan	0.090	160
COD	Congo, Democratic Republic of the	0.080	161
LAO	Lao People's Democratic Republic	0.075	162
TON	Tonga	0.075	162
UZB	Uzbekistan	0.055	164
SUR	Suriname	0.037	165
NPL	Nepal	0.001	166
BGD	Bangladesh	0.000	167
	Median:	0.345	

The Intra-Organizational sub-index varies significantly between countries. Two countries, Switzerland and (very surprisingly) Samoa place at the top of the list and followed by Denmark and Sweden. Samoa, a small developing country, has an impressive performance on this index due to its high percentage of firms offering formal training (79%). However, this high score needs further in-depth analysis to better understand why Samoa is scoring so high. The low median (0.345) indicates that the available indicators to identify internal networks are less widespread among countries. A limited number of countries achieve high scores, while a large group of countries receive lower scores. Again, the zero score does not indicate a complete absence of intra-organizational networks, but is a result of the re-scaling method, indicating a low level of intra-organizational connectedness in comparison to other countries in the ranking.

The Connectedness Index

The Connectedness Index is composed of the three sub-indices (International, Inter-organizational, and Intra-organizational Networks).

The Connectedness Index 2012 is the average of three subindices (International, lnter-organizational, and Intra-organizational Networks). This map shows the level of overall connectedness of countries for which data was available.

| 1.0 - 0.8 | 0.79 - 0.6 | 0.59 - 0.4 | 0.39 - 0.2 | 0.19 - 0 | No data |

Table 2.5: Connectedness Index

ISO code	Country	Connectedness 2012		Connectedness 2011		Ranking Differences 2011-2012
		Index	Rank	Index	Rank	
CHE	Switzerland	0.977	1	0.971	1	0
SWE	Sweden	0.915	2	0.913	2	0
DNK	Denmark	0.886	3	0.901	3	0
NLD	Netherlands	0.873	4	0.886	5	1
BEL	Belgium	0.859	5	0.875	6	1
FIN	Finland	0.849	6	0.863	7	1
SGP	Singapore	0.838	7	0.836	9	2
IRL	Ireland	0.822	8	0.803	12	4
CAN	Canada	0.822	9	0.813	11	2
USA	United States	0.820	10	0.887	4	-6
NOR	Norway	0.818	11	0.813	10	-1
AUT	Austria	0.818	12	0.837	8	-4
GBR	United Kingdom	0.785	13	0.770	14	1
CZE	Czech Republic	0.758	14	0.705	20	6
AUS	Australia	0.758	15	0.755	16	1
LUX	Luxembourg	0.741	16	0.695	21	5
ISL	Iceland	0.729	17	0.748	17	0
DEU	Germany	0.723	18	0.773	13	-5
MYS	Malaysia	0.711	19	0.716	19	0
NZL	New Zealand	0.701	20	0.682	22	2
FRA	France	0.691	21	0.756	15	-6
JPN	Japan	0.687	22	0.736	18	-4
THA	Thailand	0.666	23	0.650	26	3
EST	Estonia	0.653	24	0.640	28	4
CHL	Chile	0.640	25	0.609	33	8
ZAF	South Africa	0.625	26	0.622	30	4
ESP	Spain	0.624	27	0.613	32	5
SVN	Slovenia	0.622	28	0.666	24	-4
CYP	Cyprus	0.619	29	0.583	35	6
ISR	Israel	0.618	30	0.677	23	-7
KOR	Korea, Republic of	0.610	31	0.654	25	-6
BRA	Brazil	0.603	32	0.561	39	7
POL	Poland	0.598	33	0.523	42	9
PRT	Portugal	0.582	34	0.562	38	4
QAT	Qatar	0.577	35	0.569	37	2
TUN	Tunisia	0.574	36	0.635	29	-7
IND	India	0.573	37	0.554	40	3
ARE	United Arab Emirates	0.565	38	0.506	46	8
HUN	Hungary	0.548	39	0.590	34	-5
ITA	Italy	0.538	40	0.575	36	-4
CRI	Costa Rica	0.537	41	0.507	44	3
CHN	China	0.536	42	0.613	31	-11
SVK	Slovakia	0.529	43	0.645	27	-16
MLT	Malta	0.515	44	0.464	56	12
PAN	Panama	0.512	45	0.506	45	0
ARG	Argentina	0.503	46	0.469	53	7

BRB	Barbados	0.503	47	0.470	52	5
PER	Peru	0.496	48	0.475	51	3
RUS	Russian Federation	0.496	49	0.423	70	21
COL	Colombia	0.482	50	0.451	60	10
DOM	Dominican Republic	0.480	51	0.430	66	15
SAU	Saudi Arabia	0.477	52	0.469	54	2
PRI	Puerto Rico	0.477	53	0.463	58	5
VNM	Viet Nam	0.476	54	0.429	67	13
IDN	Indonesia	0.474	55	0.502	47	-8
JOR	Jordan	0.472	56	0.491	48	-8
KEN	Kenya	0.469	57	0.468	55	-2
HRV	Croatia	0.466	58	0.484	49	-9
LTU	Lithuania	0.463	59	0.544	41	-18
JAM	Jamaica	0.459	60	0.514	43	-17
SLV	El Salvador	0.457	61	0.405	76	15
KAZ	Kazakhstan	0.454	62	0.421	72	10
BHR	Bahrain	0.450	63	0.477	50	-13
TTO	Trinidad and Tobago	0.445	64	0.420	74	10
NGA	Nigeria	0.443	65	0.444	62	-3
LKA	Sri Lanka	0.443	66	0.464	57	-9
GTM	Guatemala	0.439	67	0.418	75	8
UKR	Ukraine	0.435	68	0.421	73	5
NAM	Namibia	0.434	69	0.399	78	9
MEX	Mexico	0.433	70	0.397	79	9
TUR	Turkey	0.431	71	0.402	77	6
PHL	Philippines	0.428	72	0.451	61	-11
GRC	Greece	0.428	73	0.422	71	-2
BGR	Bulgaria	0.427	74	0.454	59	-15
GMB	Gambia	0.422	75	0.356	92	17
ARM	Armenia	0.421	76	0.369	88	12
SEN	Senegal	0.420	77	0.394	80	3
ZMB	Zambia	0.420	78	0.425	69	-9
OMN	Oman	0.416	79	0.388	82	3
ROU	Romania	0.413	80	0.436	63	-17
URY	Uruguay	0.411	81	0.378	84	3
MNG	Mongolia	0.404	82	0.317	104	22
MNE	Montenegro	0.402	83	0.375	85	2
GUY	Guyana	0.389	84	0.303	107	23
KHM	Cambodia	0.389	85	0.366	89	4
KWT	Kuwait	0.388	86	0.431	65	-21
HND	Honduras	0.386	87	0.374	86	-1
SRB	Serbia	0.385	88	0.384	83	-5
MUS	Mauritius	0.383	89	0.431	64	-25
BWA	Botswana	0.379	90	0.353	93	3
EGY	Egypt	0.378	91	0.363	90	-1
BRN	Brunei Darussalam	0.378	92	0.346	96	4
LVA	Latvia	0.375	93	0.425	68	-25
MAR	Morocco	0.374	94	0.391	81	-13
ECU	Ecuador	0.373	95	0.370	87	-8

GHA	Ghana	0.365	96	0.347	95	-1
MWI	Malawi	0.364	97	0.337	99	2
UGA	Uganda	0.360	98	0.338	98	0
AZE	Azerbaijan	0.351	99	0.356	91	-8
MDG	Madagascar	0.350	100	0.310	106	6
BOL	Bolivia, Plurinational State of	0.350	101	0.319	102	1
MLI	Mali	0.347	102	0.317	105	3
LSO	Lesotho	0.340	103	0.298	110	7
ZWE	Zimbabwe	0.335	104	0.331	100	-4
BIH	Bosnia and Herzegovina	0.331	105	0.295	112	7
CIV	Côte d'Ivoire	0.329	106	0.348	94	-12
MOZ	Mozambique	0.326	107	0.302	108	1
LBY	Libya	0.326	108	0.290	114	6
TZA	Tanzania, United Republic of	0.325	109	0.228	125	16
CMR	Cameroon	0.307	110	0.318	103	-7
TCD	Chad	0.303	111	0.246	121	10
PRY	Paraguay	0.300	112	0.266	117	5
MRT	Mauritania	0.296	113	0.300	109	-4
MKD	Macedonia, the former Yugoslav Republic of	0.296	114	0.343	97	-17
KGZ	Kyrgyzstan	0.292	115	0.297	111	-4
VEN	Venezuela, Bolivarian Republic of	0.292	116	0.295	113	-3
BEN	Benin	0.288	117	0.255	120	3
ETH	Ethiopia	0.287	118	0.320	101	-17
ALB	Albania	0.282	119	0.227	126	7
NIC	Nicaragua	0.281	120	0.244	122	2
DZA	Algeria	0.280	121	0.243	123	2
PAK	Pakistan	0.274	122	0.261	118	-4
BFA	Burkina Faso	0.265	123	0.278	115	-8
SYR	Syrian Arab Republic	0.263	124	0.260	119	-5
MDA	Moldova	0.243	125	0.235	124	-1
TMP	East Timor	0.225	126	0.200	130	4
GEO	Georgia	0.223	127	0.225	127	0
TJK	Tajikistan	0.221	128	0.274	116	-12
BDI	Burundi	0.206	129	0.147	132	3
BGD	Bangladesh	0.204	130	0.219	128	-2
NPL	Nepal	0.127	131	0.186	131	0
SUR	Suriname	0.081	132	0.204	129	-3
	Median:	0.441		0.429	Average Difference:	6.636

The connectedness index shows the overall variation in the degree to which countries are networked, both internally as well as internationally. Some countries obtain consistently high scores across the various network indicators and hence on the connectedness index, whereas others receive consistently lower scores. The index is headed by Switzerland, followed by Sweden and Denmark.

Ranking in 7th position, Singapore as a newly developed country is an example of a country with well-developed networks in the three dimensions of the Connectedness Index. It scores 12th in International Networks, 17th in Inter-organizational, and 8th in Intra-organizational Networks. As these results are consistently high (averaging 0.838), Singapore's overall ranking surpasses several more established developed countries in the Connectedness Index whose scores in the three sub-indices vary more dramatically. Similar to Singapore, the Czech Republic also holds high scores in all three sub-indices and appears in the 14th position in the 2012 Connectedness Index. In contrast, the United States is an example of variability. It scores 1st on the Inter-organizational and the 5th in Intra-organizational Networks indices; however, due to its low score in the KOF actual flows, the USA is only 91st on the International Networks sub-index.

Also, it is interesting to note that similar connected-ness scores were reached following very distinct paths. For example, Brazil (0.603) and Hungary (0.548) occupy the 32nd and 39th ranking positions, respectively. However, while Brazil is among the most consistent in the three components of connectedness (0.646 for International Networks, 0.577 for Inter-organizational Networks, and 0.584 for Intra-organizational Networks), Hungary is among the

countries with highest variation; Hungary scores very high (0.947) on the International Networks Sub-index, a mean score on the Inter-organizational Networks sub-index (0.454), and a very low score (0.243) on the Intra-Organizational Networks sub-index. The similar result in the Connectedness Index is, in part, a consequence of our choice of the aggregation procedure (equal weighting) that uses a full compensability system, i.e., a low score in one indicator is equally compensated by a high score in other (Annex 1 describes the methodological approach used herein). Bulgaria, Zimbabwe, Algeria and Ukraine are also among the countries with highest variation in the Connectedness sub-index. Tanzania, New Zealand, Costa Rica, Saudi Arabia and Sweden, however, are among the countries with lowest variation in the three sub-indices.

Graphs 2.1-2.3 present scatter plots comparing the three sub-indices: international, inter-organization and intra-organization networks. The X and Y-axis present the median scores. These graphs help visualize the different scores of countries and between countries on the different network subindices. For example, looking at graphs 2.1 and 2.2 it is easy to visualise the case of the United States, with high scores on Inter and Intra-organizational networks, but only a median score on International networks. Similarly, graph 2.2 highlights the case of Samoa at the bottom right side, with a very high score on Intra-organizational networks, but scoring below the median on International networks. Also, the countries with consistent scores in each of the three Connectedness components can be easily identified looking at these graphs. For example, Switzerland, Sweden and Finland place in the top right side of the three graphs. At the other extreme, Nepal and Suriname can be easily identified at the bottom left of these graphs.
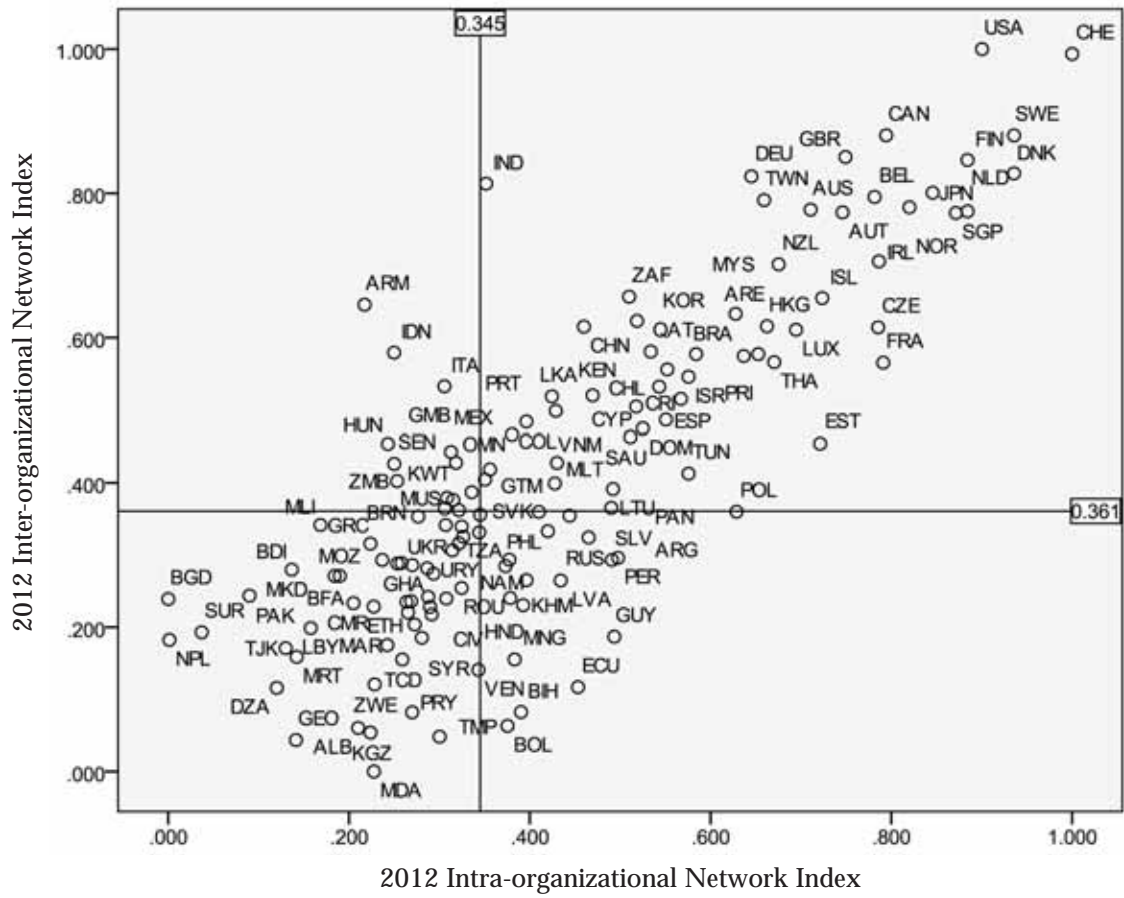
Graph 2.1: Relationship between International and Inter-organizational Networks
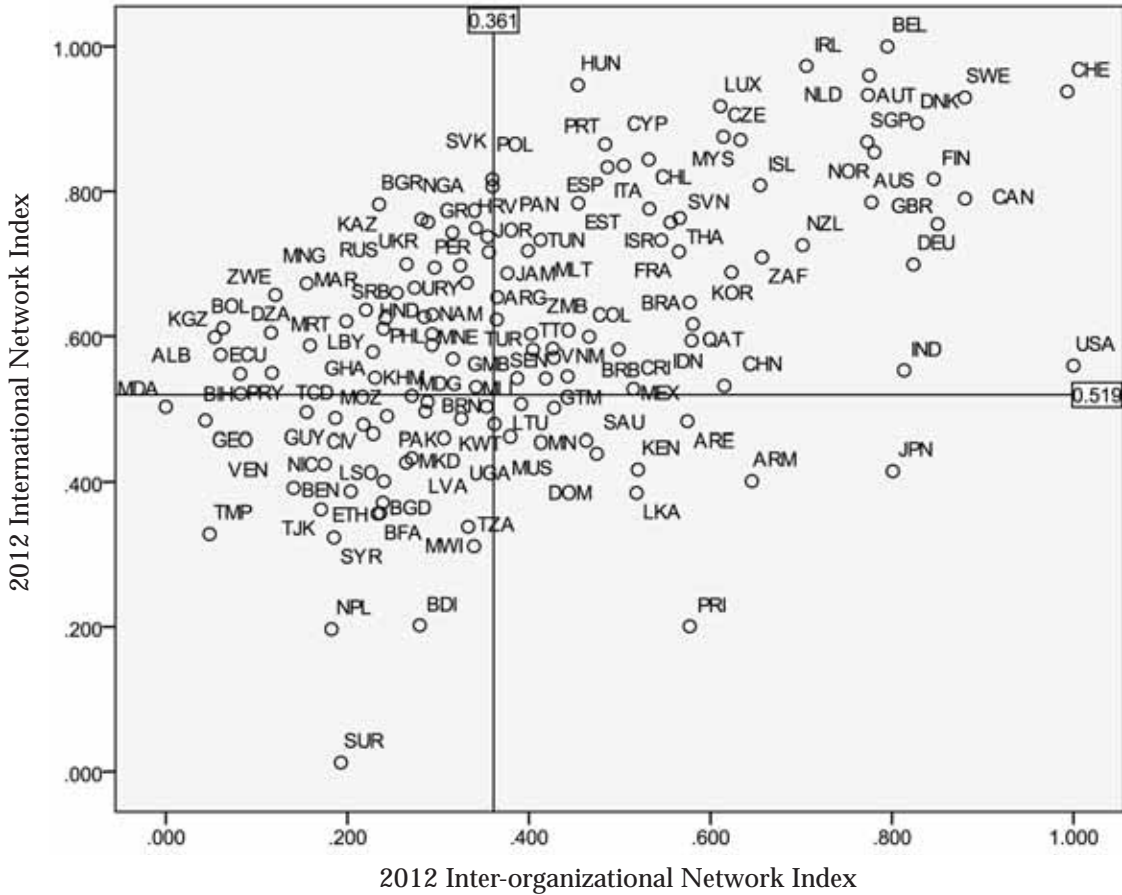
Graph 2.2: Relationship between International and Intra-organizational Networks
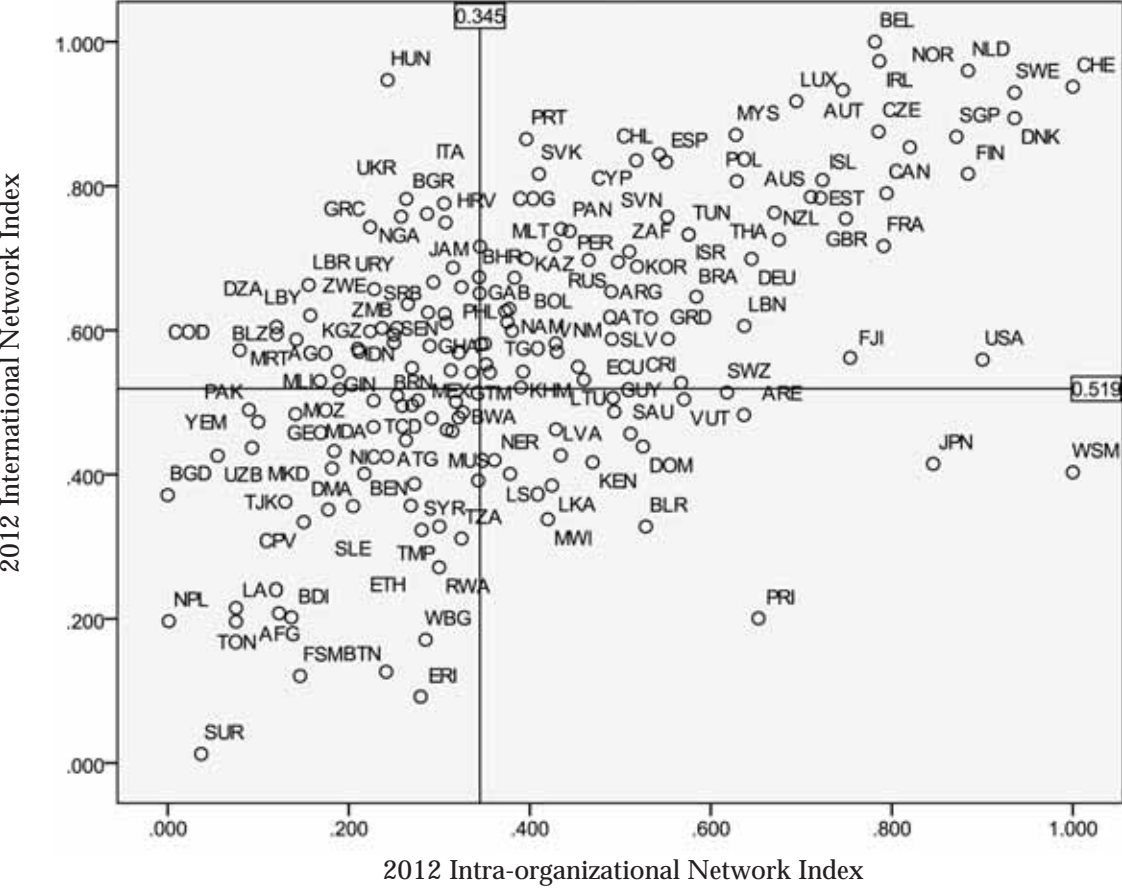
Graph 2.3: Relationship between Inter-organizational and Intra-organizational Networks

THE CONNECTEDNESS INDEX 2011 AND 2012 COMPARED

In this sub-section, the Connectedness Index 2012 is compared with the Connectedness Index 2011. The differences between these indices are presented in table 2.5. Minimal differences separate the rankings of the countries in the top of the list. The three countries in the top of the list – Switzerland, Sweden and Denmark – reach exactly the same positions. The Netherlands, Belgium and Finland increased one position each. Singapore increased two spots in the ranking.

Among the top ranked countries, the most significant changes are in the United States and the Czech Republic's rankings. Between 2008 and 2009, the United States score on the international networks sub-index decreased; the country consequentially dropped from the 4th to the 10th position in the 2012 Connectedness Index. In contrast, the Czech Republic jumped 6 positions, from the 20th to 14th. The Czech Republic increased in all three sub-indices, most dramatically in the intra-organizations sub-index.

The average difference (up or down) is 6.6 ranking positions. Nine countries keep the same positions as in the previous ranking and another 38 change a maximum of 3 positions. 26 countries change more than 10 positions from one year to the next. Mauritius and Latvia experience the greatest changes (from 64th to 89th, and from 68th to 93rd), the latter dropping 25 positions between the two indices. On the other hand, Guyana, Mongolia and Russia most significantly increased their ranking positions. Guyana jumps 23 positions, from the 107th to 84th; Mongolia increases 22 positions, rising from 104th to 82nd: and Russia improves 21 positions, from the 70th to the 49th position. Overall, there was a slight increase in the median score of countries, from 0.429 to 0.441, indicating that more countries achieve higher scores indicating that they are becoming more connected.

It is interesting to note that, given the methods for calculating scores and the 0 and 1 scoring range, small score differences can make significant differences in the ranking positions. Serbia and Singapore, for example, present a very small increase in their scores from 2011 to 2012 (almost the same score), but Serbia decreased 5 positions and Singapore won 2. On the other hand, the differences in scores are higher in the case of Switzerland (positive) or Malaysia (negative), but the countries maintain the same rankings in the 2011 and 2012 Connectedness Indices.
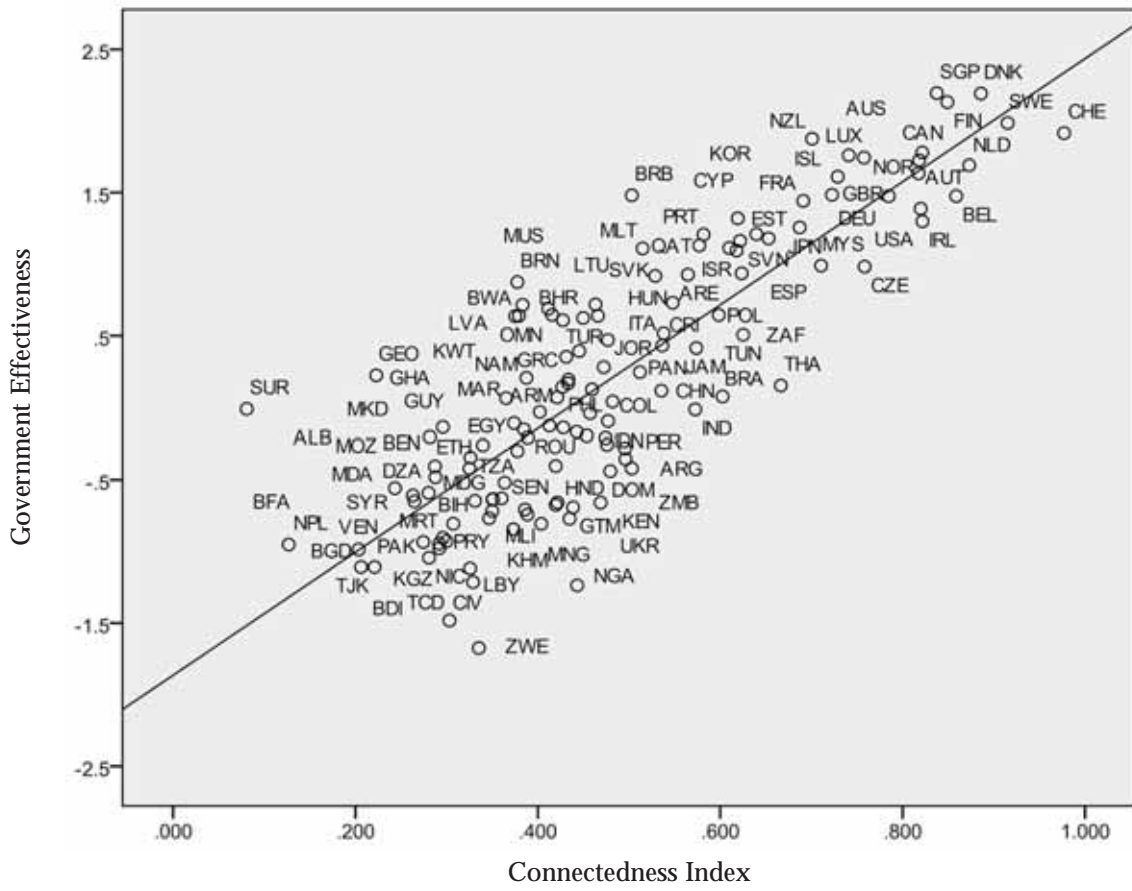
THE RELATIONSHIP BETWEEN CONNECTEDNESS AND GOVERNMENT, INDUSTRIAL AND ECONOMIC PERFORMANCE

The quantitative nature of data produced lends to a series of graphs and a correlation matrix. Arranging the results in this way helps expose the relationship between connectedness and government effectiveness, regulatory quality, competitive industrial performance, and GDP per capita PPP. The graphs clearly show a strong positive linear relationship between connectedness and the various performance indicators.
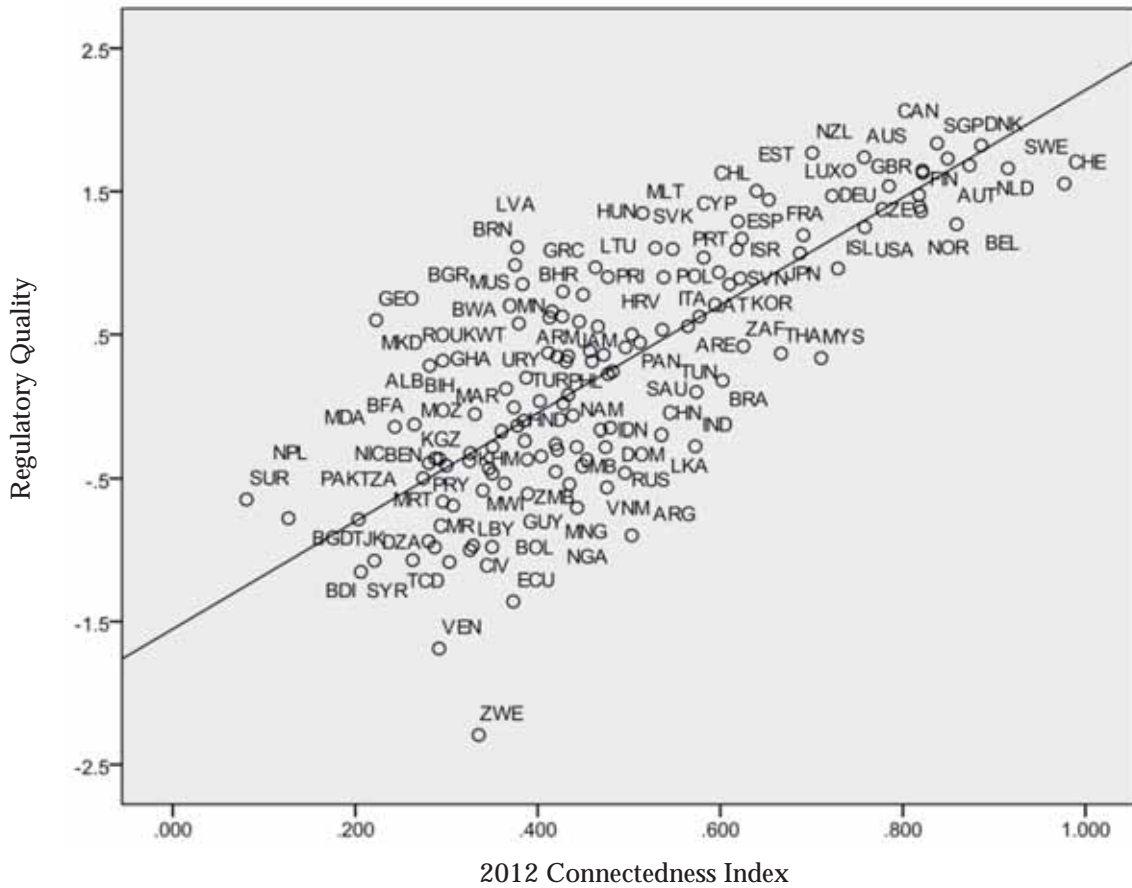
Given the linear relationship between the variables (see graphs 2.4-2.7), the Pearson Product-Moment Correlation Coefficient is used to measure the relationship between the different indicators, although no causal inferences were intended with this analysis. The correlations between the Connectedness Index and the four development measures listed above are high, ranging from 0.721 (connectedness x GDP per capita) to 0.845 (connectedness x Government Effectiveness) (presented in table 2.6). This indicates that, in the majority of the cases, connectedness and these development measures follow the same direction, i.e., when one increases (decreases), the other follows a similar standard. Graphs 2.4 to 2.7 demonstrate this trend.

Disentangling causal relations in this context is impossible given longitudinal data constraints. In their contribution to the 2012 Networks for Prosperity Report, Meyer et al. focus specifically on the issue of how integration, or network formation, contribute to economic growth and disentangle the causal relations. They find a causal impact of network formation between countries, measured on the basis of trade networks, on economic growth.
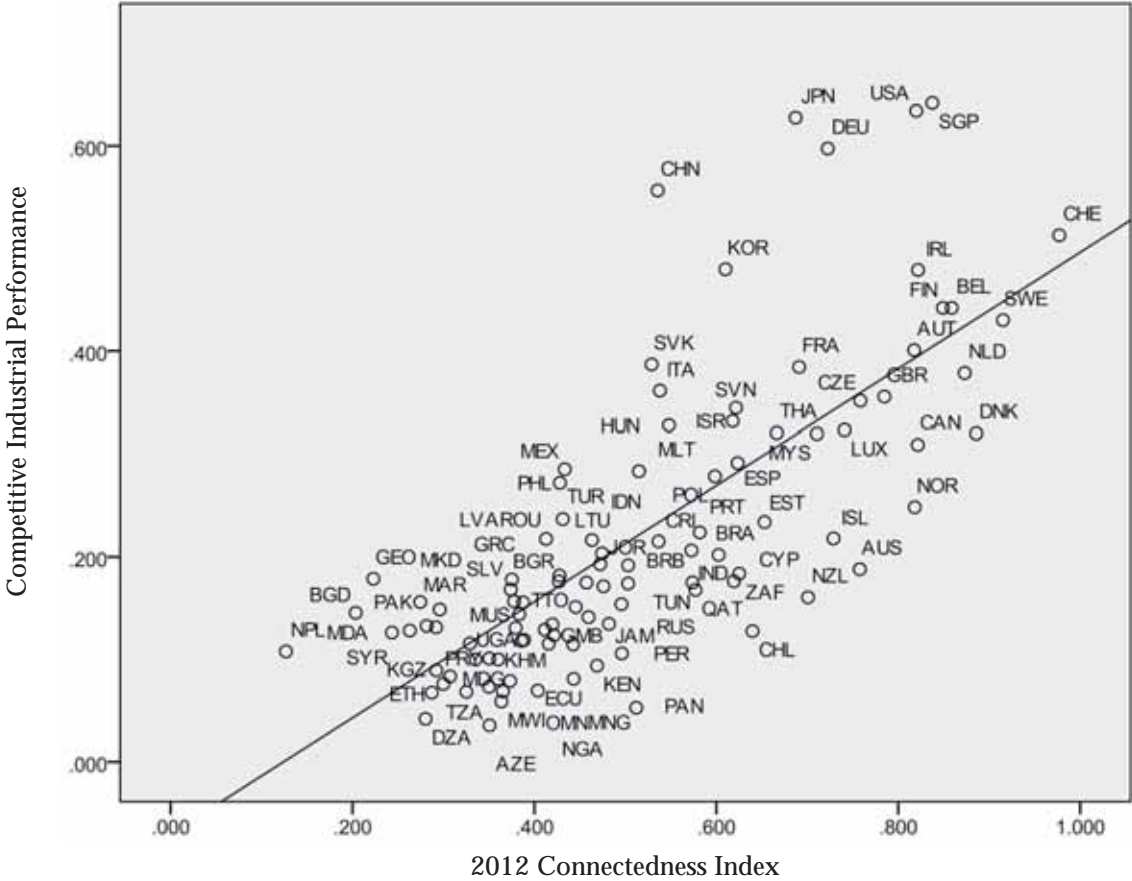
Graph 2.4: Government Effectiveness x Connectedness Index

Graph 2.5: Regulatory Quality x Connectedness Index

Graph 2.6: Competitive Industrial Performance x Connectedness Index

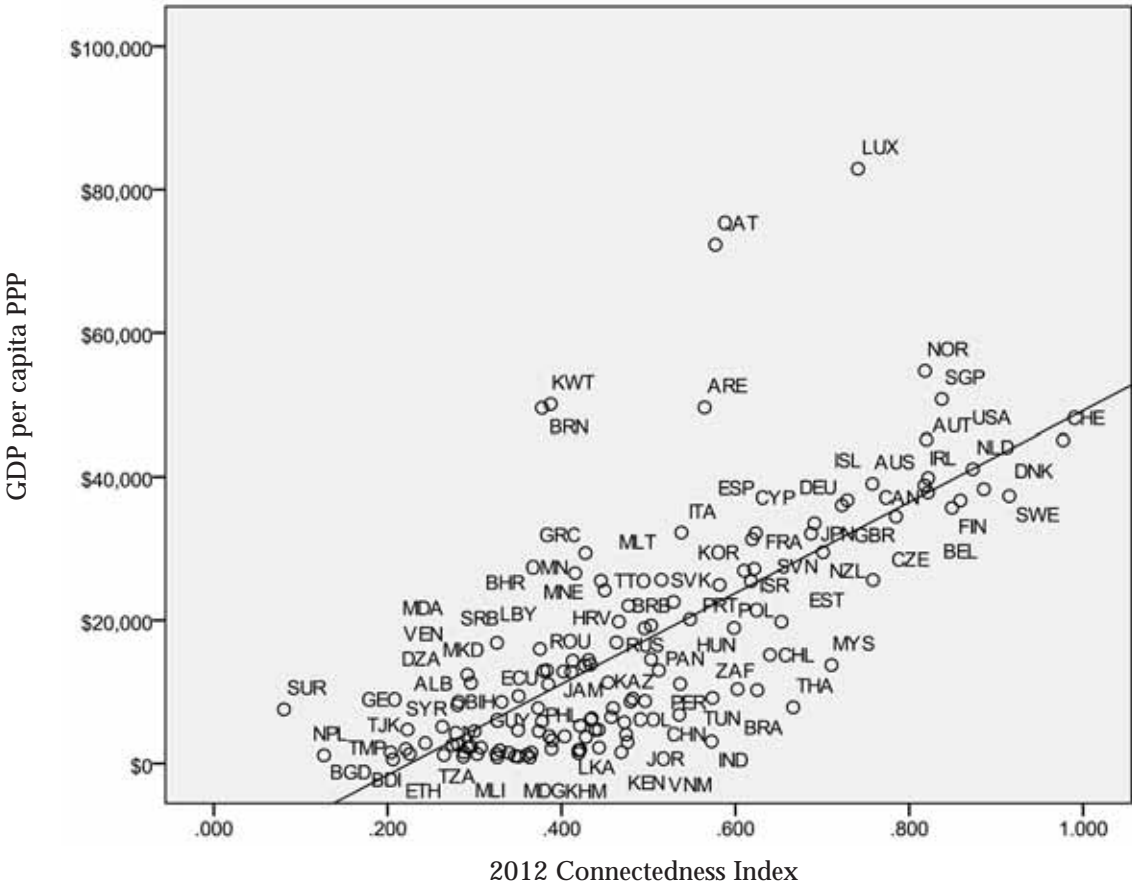*Graph 2.7: GDP per capita PPP x Connectedness Index*

Table 2.6: Correlations

	Connectedness Index	Political globalization	Economic globalization	International Net.	Inter-firm Networks	University-industry Net.	Professional Association	Inter-org. Networks	% firms offering formal training	On-the-Job Training	Intra-org. Networks	Government Effectiveness	Regulatory Quality	Competitive Industrial Performance	GDP per capita PPP
Connectedness Index	1														
Political globalization	.525**	1													
Economic globalization	.599**	-.036	1												
International Networks	.779**	.795**	.578**	1											
Inter-Firm Networks	.854**	.468**	.315**	.529**	1										
University-Industry Net.	.906**	.406**	.420**	.570**	.823**	1									
Professional Association	.111	-.131	-.092	-.162	.049	.066	1								
Inter-org Networks	.904**	.408**	.340**	.511**	.904**	.932**	.328**	1							
% firms offering formal training	.510**	.181	.332**	.360**	.181**	.192**	-.076	.157	1						
On-the-Job Training	.926**	.394**	.466**	.597**	.885**	.918**	.037	.905**	.198**	1					
Intra-org. Networks	.929**	.366**	.440**	.559**	.778**	.843**	.009	.814**	.868**	.896*	1				
Government Effectiveness	.845**	.176**	.489**	.449**	.748**	.814**	.086	.797**	.281**	.839**	.709**	1			
Regulatory Quality	.792**	.236**	.467**	.483	.715**	.741**	.046	.731**	.284	.773**	.658**	.928**	1		
CIP	.746**	.446**	.314**	.529**	.761**	.771**	-.011	.754**	.255**	.758**	.687**	.703**	.657**	1	
GDP per capita	.721**	.275**	.490**	.533**	.665**	.690**	-.040	.667**	.311**	.714**	.638**	.788**	.733**	.605**	1

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Comparing Connectedness Indices

INTRODUCING THE GHEMAWAT CONNECTEDNESS INDEX

Notwithstanding the growing importance of networks and network governance in academic literature, few studies covering countries worldwide have published data on the degree to which countries establish different kinds of networks in order to pursue development. Independent of one another, the UNIDO Connectedness Index and the Ghemawat Global Connectedness Index were both launched in 2011 as exploratory attempts to measure such kinds of networks. In this sub-section, these two connectedness measures are compared in order to determine the degree to which the concepts measured are similar or different. The 2012 UNIDO Connectedness Index will be used in this comparison.

In a report commissioned and published by the German postal and shipping giant DHL, authors Pankaj Ghemawat and Steven Altman develop a measure of global connectedness. Their results are published in the DHL Global Connectedness Index 2011: Analyzing global flows and their power to increase prosperity. Similar to the Networks for Prosperity report, the central focus is the identification and quantification of variables capable of measuring "a country's integration with the rest of the world, as manifested by its participation in international flows of products and services, capital, information, and people," (Ghemawat, 2011). The study proposes that measuring these flows and generating a connectedness index will expose the actual degree of globalization and debunk varying perceptions- both positive and negative- of current levels of globalization; indeed, the authors indicate

that "[t]he focus on actual flows is motivated by the sense that while connectivity or the technical potential for connectedness has improved a great deal thanks to changes in transportation and communications technologies, actual levels of flows significantly lag that potential," (Ghemawat 2011, 32).

Emphasis is on two key ideas: depth of connectedness and breadth of connectedness. Depth, in this sense, differentiates between activity taking places internationally and that which occurs domestically (Ghemawat 2011, 17). It attempts to capture the relative importance of international interactions by scaling global flows by the size of the domestic economy, in turn creating a variable that measures the intensity of international connections. Breadth, on the other hand, accounts for the geographical distribution of connections and accounts for the tendencies toward regional and sub-regional relations. This approach, the authors note, parses out data to separate the "international" from the "global," considering measures of distances and differences between partnering countries (Ghemawat 2011, 20). Gauging breadth is based on "the difference between the distribution of its exports across destination countries versus the rest of the world's distribution of merchandise imports" (Ghemawat, 34). Thus, the level of global dispersion or distribution of a country's connections is an equally important and unique element to this index.

The Ghemawat Global Connectedness Index does not, however, account for social or political variables. Deemed "connectedness enablers," these variables are omitted to maintain a focus on flows and to

allow policymakers space to "foster the aspects of connectedness that they deem most constructive for their countries," (Ghemawat 2011, 32). Only hard data is incorporated into the analysis- misperceptions about globalization identified in various surveys dissuaded the authors from incorporating qualitative data in the analysis, hoping that such exclusions would allow space for policymakers to interpret results in individual, meaningful manner.

Four typographies, referred to as pillars, of flows are identified and quantified: trade flows, capital flows, information flows, and people flows (see table 2.7). Each pillar is constructed as a compilation of two to four sub-variables, and within the sub-variables, both depth and breadth are considered.

To reach a single measure of connectedness, each value is scored from 0 to 50 for both depth and breadth, and variables receive an overall connectedness score between 0 and 100. Topping the list is the Netherlands, followed thereafter by Singapore, Ireland, Switzerland, and Luxembourg. Four other European Union nations and one Asian state round out the list of top 10 most connected countries (in descending order, the United Kingdom, Sweden, Belgium, Hong Kong and Malta). Nepal, Paraguay, Guatemala, El Salvador, and Botswana lie at the bottom end of the Index, representing the lowest overall connectedness of the 125 countries for which sufficient data was available.

Interestingly, European Union nations dominate the list of most connected states and states with the greatest breadth of connections. EU treaties and laws promote interregional trade and cooperation and facilitate international trade within the Union; though substantial financial and political dialogue emphasized regional relations, these same states also kept a keen eye to the exterior, globally expanding trade, capital, information and people flows. The presence of Hong Kong and Singapore at the top of the connectedness index is also of note- both are small, open Asian economies.

Of the 125 states evaluated, those scoring the lowest on the Index are spread across Africa, South America and Asia. Not only are the majority of these states on the UN's list of developing or least developed countries, five of the bottom ten are landlocked countries, a noted hurdle for states seeking progress towards economic growth (Collier, 2008).

The central focus of both indexes is the identification and quantification of variables capable of measuring a country's integration with the rest of the world, as manifested by its participation in international flows of products and services, capital, information, and people.

Table 2.7: Components of Ghemawat Global Connectedness Index

Pillar	Components	Data Measure	Data Source
Trade	Merchandise Trade	Total Merchandise Exports and Imports in US dollars a current prices	World Trade Organization Statistics Database
Capital	Services Trade	Total Exports and Imports of commercial services in US Dollars	World Trade Organization Statistics Database
	FDI Stocks	FDI outward and inward stocks as a percentage of GDP	World Investment Report (UNCTAD)
	FDI Flows	FDI outflows and inflows as percentage of Gross Fixed Capital Formation	World Investment Report (UNCTAD)
	Portfolio Equity Stocks	Equity securities assets and liabilities in millions of US dollars	Balance of Payments Statistics (IMF)
	Portfolio Equity Flows	Equity security assets and liabilities (net) in millions of US dollars. Average of the current year and the 2 previous years for volatility considerations	Balance of Payments Statistics (IMF)
Information	Internet Bandwidth	International internet bandwidth per user	ITU
	Telephone Call Minutes	Total outgoing and incoming telephone calling minutes	Telegeography International Traffic Database
	Trade in Printed Publications	Total exports and imports of commodities classified for customs purposes as falling under H.S. 49 (printed books, newspapers, pictures, manuscripts, typescripts and plans)	UN Comtrade
People	Migrants (Foreign born population)	International outbound and inbound migrants as a Per cent of total population	Human Development Report (2009), UN Populations Division-trends in Total Migrant Stock
	Tourism	Arrivals of non-resident overnight visitors at national borders	Compendium of Tourist Statistics, UNWTO
	International Students	Total number of students studying abroad and total number of foreign students.	UNESCO Institute for Statistics

It is important to note that conceptually, the Ghemawat Global Connectedness Index differs substantially from the UNIDO Connectedness Index. Essentially, it is concerned with international (cross-border) connectedness and does not depart from the perspective that networks operate on three distinct levels (inter-organizational, intra-organizational and international), as is the case in the UNIDO Connectedness Index. This difference in conceptualization results largely from the different objectives inherent to the two reports. UNIDO's Connectedness Index emerges out of an exploration of the importance of networks in the context of knowledge management, while the Ghemawat Connectedness Index is primarily concerned with capturing cross-border flows. However, they both intend to capture a degree of connectedness. To what degree do the both indices differ?

COMPARING THE CONNECTEDNESS INDICES.

Since both the Ghemawat and the UNIDO Index are attempts to measure a similar latent concept, i.e., the degree to which a country is networked, a high degree of similarity is expected between these measures. Table 2.8 and graph 2.8 explore this issue and present the relationships between the two indices. Table 2.8 shows that the correlation coefficient between the UNIDO and Ghemawat Connectedness is very high (0.78), indicating that, for the majority of the countries, the two indices generate similar results. Accordingly, when a given country scores high (low) in one measure, the country also scores high (low) on the other measure.

*Table 2.8: Pearson Correlation UNIDO x Ghemawat Connectedness*

	UNIDO Connectedness (%)	Ghemawat Connectedness (%)
UNIDO Connectedness (%)	1	
Ghemawat Connectedness (%)	.783**	1

However, a closer inspection of graph 2.8 shows that this strong correlation is not linear across scores. Graph 2.8 shows an arrow like shape with a clear point and a wavering back end- this indicates that the two indices are strongly correlated where countries score high on both indices, but correlate less significantly where countries score on the lower end of the scales. These similarities among the top countries and the differences among the bottom countries are visualized in graph 2.8. On the top right side of the graph, the countries lie close to the diagonal line, representing a perfect match between the two indices. Ideally, if these two indices were exactly equal, all countries would be plotted on the diagonal. Countries like Switzerland, Sweden and the Netherlands, for example, are very close to the line; in contrast, countries in the bottom left side of the graph vary more greatly as evident by their greater distance (on average) from the diagonal. For example, countries such as Zimbabwe, Pakistan and Moldova are clearly more distant from the diagonal line than countries in the top right.

For some countries there are very significant differences between the two indices. El Salvador, Dominican Republic, Costa Rica, Guatemala, Argentina, Colombia and Indonesia, for example, score relatively well on the UNIDO Connectedness Index and less on the Ghemawat Index. For instance, the Dominican Republic scores high on the inter- and intra-organizational sub-indices, but low on the international networks sub-index which is close to the Ghemawat measure. Ghana, Georgia and Moldava on the other hand score well on the Ghemawat Connectedness index, but less on the UNIDO Connnectedness Index. For example, Ghana scores low on the inter and intra-organizational networks sub-indices, but scores higher than average on the international networks sub-index and in the Ghemawat index.

These results show that the conceptual differences in the composition of the UNIDO and the Ghemawat Connectedness Index do not result in significantly different ranking positions of the most connected countries. However, with regard to less connected countries, the analysis shows wider variation between the two indices. This is not surprising given that some countries score very differently on the three subcomponents of the UNIDO Connectedness Index. A high score on the UNIDO Connectedness Index implies a high score on each of its three sub-components including the international sub-index which is most equivalent to the Ghemawat Index. When the score decreases this might imply for some countries that they score high on the intra- and inter-organizational sub-components of the UNIDO Connectedness Index but low on the international sub-component explaining the divergence with the Ghemawat Index.

Graph 2.8: UNIDO Connectedness x Ghemawat Global Connectedness Index
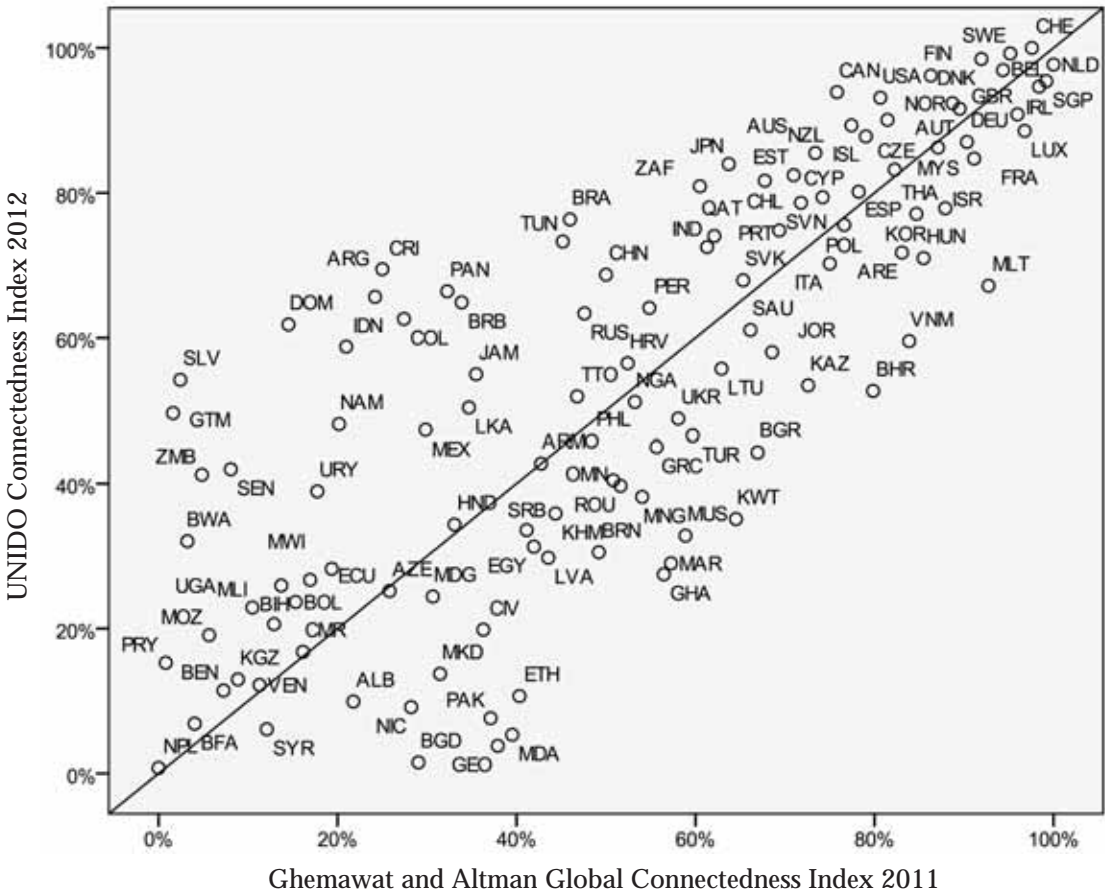
Conclusions

This chapter presents and discusses UNIDO's Connectedness Index 2012, covering 132 economies around the world. This new index updates the 2011 index launched in the first Networks for Prosperity Report and shows how countries have progressed in the overall degree to which they are connected and on three distinct levels of networks: the international, inter-organizational and intra-organizational level.

Comparing the 2011 and 2012 Connectedness Indices shows that, overall, more countries achieved higher scores; this change is observed in the increase of the median score. In general, the ranking of most countries remains similar with some notable exceptions indicated in the report.

Similar to the 2011 Connectedness Index, the Connectedness Index 2012 correlates highly with relevant outcome variables such as government effectiveness, industrial development and economic development. This correlation is interesting and stimulates further research, but does not imply any causal relationship. The issue of causality is very relevant, however, in the discussion of countries' networks. The contribution by Moritz Meyer et al. in this report attempts to do just this, and in disentangling the causal relations, it discusses how integration or network formation contributes to economic growth trade networks.

Lastly, the UNIDO Connectedness Index 2012 is compared with the Ghemawat Global Connectedness Index 2011. The comparison makes clear that both indices differ significantly, both conceptually as well as methodologically. Countries ranked as the most connected are similar between the two indices, but significant differences appear between countries scoring lower on the two indices.

2.2
Being close to grow faster

Moritz Meyer,
Georg Duernecker and
Fernando Vega-Redondo

A network-based empirical analysis of economic globalization[i]

Globalization has been one of the major global trends which shapes economic outcomes in developing and developed countries. During the past fifty years, political change and economic transformation have enhanced international trade between countries. Furthermore, new transportation and information technologies contributed to an increased exchange of goods and services.

Even though globalization is well documented from a narrative perspective, the measurement of this process remains a key challenge among academic researchers and policymakers.

The multitude of different concepts and measures which were applied so far can be categorized into three separate classes: The first, trade intensity, is probably the most prominent one. It measures the amount of aggregate trade volumes of an economy relative to its total production. More concretely, it is expressed as the ratio of the sum of imports and exports to the gross domestic product for a given year. The second class of measures evaluates a country's outward orientation in terms of the level of tariffs and also accounts for possible non-tariff trade barriers as well as political and economic factors which potentially affect a country's foreign exposure. The third class considers a wide range of different

economic, political and social characteristics of an economy and factors all of the selected dimensions into a weighted composite index. Essentially, all of the three classes of globalization measures were heavily criticized on various grounds and a number of severe deficiencies were explicitly pointed out which suggest the limited usefulness of the conventional indicators.

This chapter proposes a novel approach to quantifying a country's outward orientation and makes use of social network theory to evaluate the degree of integration of an economy into the global network structure.

The methodology allows for a potential role of second- and higher-order relationships between countries for the connectedness of a given country. As a consequence, the new measure of economic integration accounts for the increasing importance of global production chains which gained in importance especially for countries in Europe, Northern America and East Asia. The construction of the index of economic integration builds on the well-established concept of centrality. Here, economic integration

refers to a framework which takes into consideration the relative network position of each country with respect to all other economies in a global trade network. Consequently, the new measure of economic integration does not only relate to direct trading links between countries but also incorporates indirect trading links. Findings from the empirical analysis show that these higher- order links are of key importance. The computations make use of the wide set of bilateral import and export flows from the United Nations Comtrade database and exploit a set of 143 countries over the period from 1962 to 2008 to characterize the country's network position in a global trade network.

Descriptive statistics show that economic openness and economic integration describe two different dimensions of economic globalization.

The correlation between these two measures is surprisingly low. For example, using the traditional concept of trade intensity many African economies are characterized as relatively open towards international trade. On the contrary, the measure of economic integration takes into consideration the relative position of each country in the global trade network, such that for example the Central African Republic

shows up rather to the bottom of the ranking (see figure 2.2). China might be another noteworthy example which highlights the drawbacks of traditional measures of globalization (see figure 2.3). In terms of trade restrictions and the black market premium on the official exchange rate the economy is characterized as closed which contradicts a widely shared perception that China is one of the drivers behind economic integration, especially on the Asian continent. The measure of economic integration emphasizes the significant changes the Chinese economy has made over the last years and reflects the participation into international trade which we observe today. Based on this observation, results in this note suggest that conventional indicators of openness, which are mostly based upon aggregate trade statistics or trade policies, are only a very rudimentary description of a country's outward orientation.

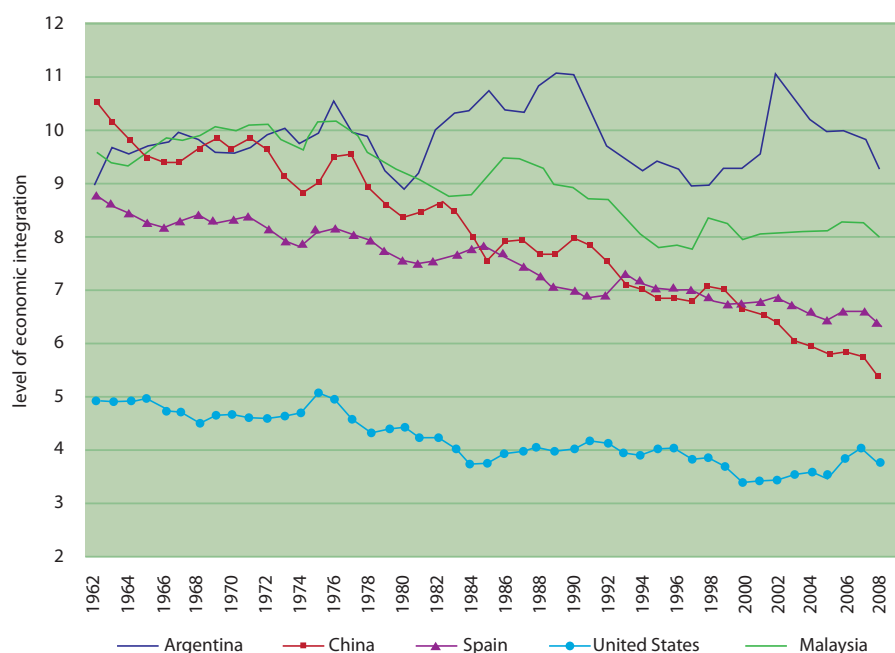*Figure 2.2: Economic integration around the globe (selection 1)*
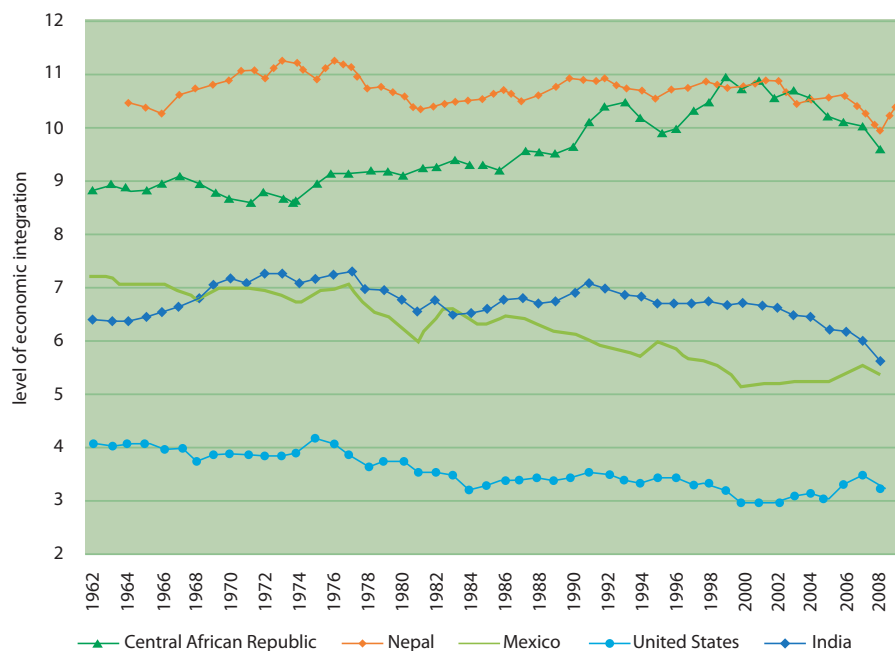
Note: The measure on econmic integration captures the distance towards other countries in the global network. Accordingly a high level implies that a country is less integrated. Data: UN Comtrade 1962-2008, own calculations.

Summary statistics illustrate the validity of the new measure of economic integration on the country level.

The time series profiles for different countries do not only reflect changes within a country but also changes in response to broader developments in the global trade network. For example, the profile for Argentina (see figure 2.3) suggests that the degree of economic integration decreased as a consequence from the sovereign default to the beginning of the 2000s. On the contrary, the measure for China illustrates how the end of the Cultural Revolution and the increasing participation into the world economy at the beginning of the 1980s increases the measure of economic integration substantially (see figure 2.3). Furthermore, the measure of economic integration does not only capture changes which affect the country of interest but also takes into consideration broader trends in the global trade network which affect the country through indirect trade links. For instance, the formation of the North Atlantic Free Trade Area between Mexico, Canada and the United States has increased the degree of economic integration for Mexico in two distinct ways: first, the reduction in transaction costs for bilateral trade has provided better access to economic opportunities in Canada and the United States; second, Mexico has benefited from the very central network position of the United States in the world economy (see figure 2.2). Accordingly the improved relative network position of Mexico in the global trade network did not only attract foreign investment to exploit market opportunities in the country itself, but also relates to the improved access of Mexico to the United States and further (indirect) market opportunities. This mechanism of direct and indirect effects in a global trade network motivates the link between economic integration and economic growth.

Figure 2.3: Economic integration around the globe (selection 2)

Note: The measure on econmic integration captures the distance towards other countries in the global network. Accordingly a high level implies that a country is less integrated. Data: UN Comtrade 1962-2008, own calculations.

The theoretical framework defines an environment where firms benefit from further integration which enhances cooperation and boosts economic activity.

On the firm level a more central network position enhances the flow of information and builds trust between partners. As a consequence cooperation deepens, joint projects evolve and firms benefit from further knowledge and technology transfer. In addition, firms realize higher returns to investment since access to markets and opportunities increase. Thus on the micro level economic integration supports the growth of firms whereas on the macro level it fosters economic growth on the country level.

Standard results from the empirical growth literature suggest that participation in worldwide trade is an important determinant of economic growth.

With the aforementioned measure of economic integration at hand, this chapter turns to a long-standing discussion in the empirical literature on economic growth which concerns the effect a country's outward orientation on economic growth. The existing literature on this matter has produced a vast number of possible explanations to understand economic growth in a cross country and within country perspective. Most of these results have been highly disputed, mainly because of difficulties in measuring globalization and various econometric shortcomings.

The empirical identification strategy takes into account the dynamic panel structure of the data to disentangle the impact of economic integration on economic growth.

Here, the empirical specification aims at the identification of a causal link between a set of variables and economic activity on the country level. More specifically, empirical findings in this note illustrate that the new measure of economic integration of a country into the global network is particularly important to understand the growth performance of an economy. This note contributes to this literature by introducing a newly developed measure of economic integration into an empirical growth framework and, at the same time, it improves on previous econometric methods. More concretely, findings from the empirical analysis build on a dynamic panel framework and exploit within country variation to establish a causal relationship.

Dynamic panels have been established as an advanced method in the empirical growth literature to foster explanations for the observed disparities in the economic growth performance across and within countries.

In comparison to traditional cross sections, dynamic panels allow for country fixed effects to control for unobserved, but country fixed heterogeneity, and allow for lagged variables in the dynamic panel framework. Furthermore, the empirical identification strategy makes use of internal instruments to deal with the issue of endogeneity which plagues most of the regression analysis in the empirical growth literature. Identification comes from within country variation.

Empirical findings suggest that the new measure of economic integration is an important factor for explaining growth differences, and that it displays a statistically significant and robustly positive effect on economic growth.

Controlling for the standard set of independent variables in the empirical growth literature and using different robustness checks, findings suggest a significantly positive effect of integration on economic growth. Robustness checks include a bayesian model averaging exercise which underlines the relative importance of the measure of economic integration to explain economic growth. The previous literature has elaborated on a wide set of possible candidates which influence economic growth. Often it is difficult to establish a causal relationship and at the end of the day it is not clear which variables are the most prominent ones to include into an empirical growth model. In these terms results from the Bayesian model averaging approach suggest that in contrast to trade intensity, economic integration shows up to be economically and statistically significant independent of the composition of the set of independent variables. The calculated inclusion probability refers to the relative importance of the measure of integration of being included into an empirical growth model and supports the validity of the theoretical and empirical relevance of economic integration to explain economic growth on the country level. In essence, the positive relationship between integration and economic growth emphasizes the importance of a country's position in a global trade network.

From a policy perspective these findings emphasize the link between a country's position in a global trade network and its economic growth performance.

A more central network position allows for higher returns to investment due to enhanced cooperation and further knowledge transfers on the firm level. Then, direct and indirect trading links and a more central position in the global trade network boost economic growth on the country level. As a consequence, initiatives to foster trust and cooperation between partners describe a promising path towards higher economic growth and prosperity. Here multilateral trade agreements on the country level reduce information and transportation costs and allow for market access and further growth opportunities from direct and indirect trading links.

PART 3:
Knowledge Networks in Practice
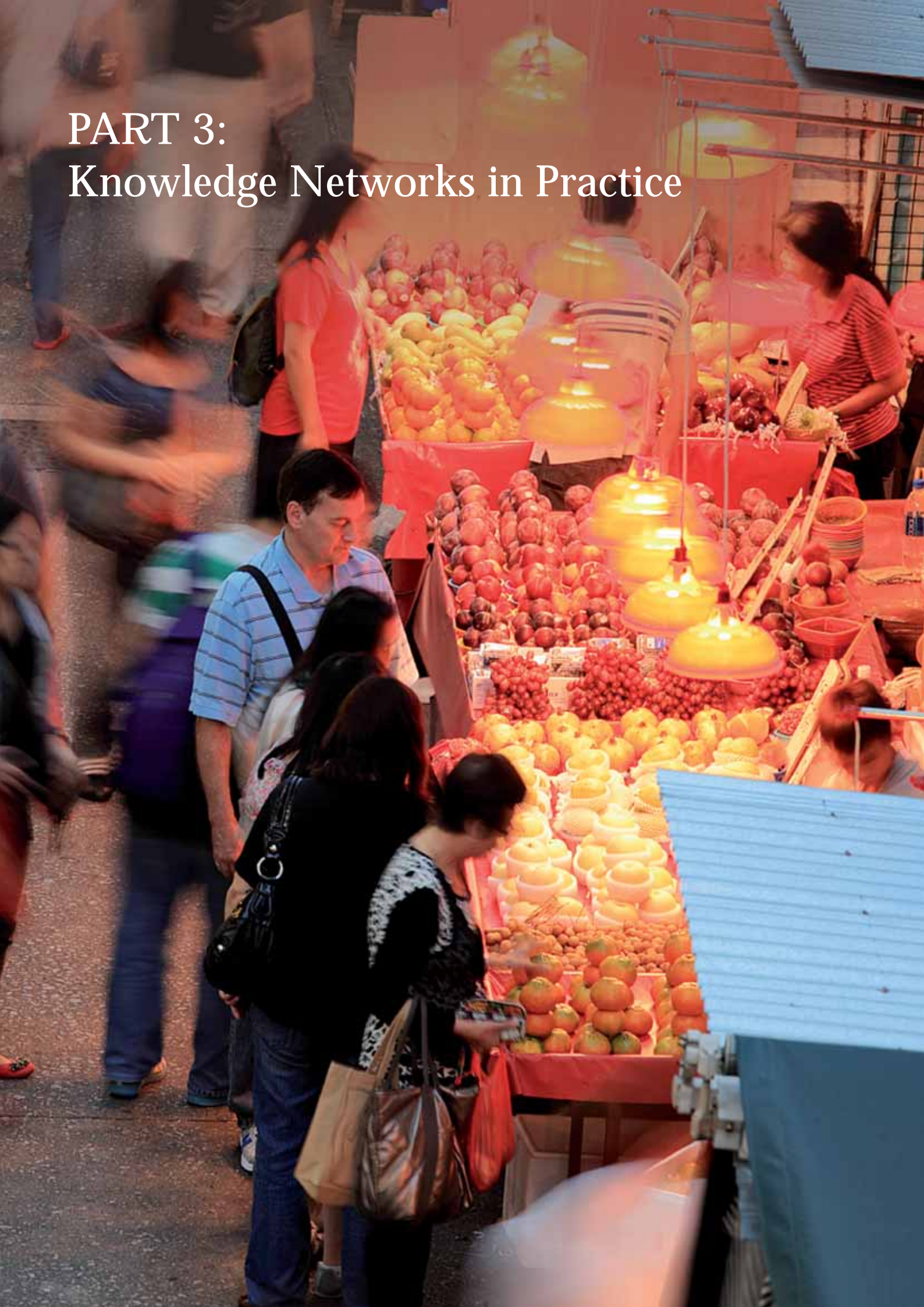
Introduction

Theoretical explorations of networks are only valid if they hold in practice. This section turns attention to networks in the real world, looking at four separate, issue-specific networks.

Regional, business, trade, and development cooperation networks are the subject of the case studies that follow. Each contribution highlights the interworking of these networks and draws attention to the relevant actors, strategies, and outcomes across organizational units.

The first contribution, by Jorge Rodríguez Vives, documents the creation of a Competitiveness Council within Costa Rica. The Brunca Region, located in the southwest corner of Costa Rica, introduced the Council in order to revive local private sector development and vamp efforts to improve local welfare, particularly for women and youths. The contribution documents the Council's experiences pairing policy makers, business owners and community members with academic support to address competitiveness in four key local business sectors: agri-business, tourism, municipal sectors, and government agencies. In turn, the Council fermented information transfer and learning, two key functions of knowledge network and a prime example of an inter-organizational network.

Trade networks are the subjects of the second contribution by Johan Adriaensen. The trade and development link, in particular, is examined, and the author employs network theory to understand how trade administrations work. Three specific trade administrations are highlighted, and the administrations' role in building a knowledge network is seen to be instrumental to develop a trade policy and as input in trade negotiations.

A third contribution, by Ariane Agnes Corradi, shifts attention south of the equator to Brazil but keeps sights on business development. This case study focuses on the impacts of networks in business incubators which are designed to aid new businesses in overcoming barriers to market entry and participation. The business incubators under study uniquely emphasize the role of informal networks at the inter-organizational level and the importance of incubator managers as network facilitators.

A fourth case study, by Thomas Vogel and Petra Koppensteiner, comes from an Austrian NGO dedicated to development cooperation. The report from HORIZONT3000 documents the construction of a network for the sharing of "best practices" among partner organizations in the developing world. The organization's experiences in building a knowledge network are detailed, noting their construction of an international network consisting of Austrian organizations, local development partners, and research partners. HORIZONT3000's contribution incorporates a practitioner's perspective and the organization's efforts to encourage "systematization" - a participatory process of generating and sharing knowledge- yield lessons for knowledge management in practical situations.

Though each case treats different actors, regions, or sectors, they together form a dynamic picture of various functioning networks and how knowledge make a difference and create added value. Challenges and responses for the Brunca Region's construction of a Competitiveness Council, for example, can underscore the lessons exposed in HORIZONT3000's contribution. The diversity of public and private actors and their functioning across the international, inter-organizational and intra-organizational levels also point to boundaries for knowledge networks, later detailed in section 4.

3.1
Creating development through competitiveness councils

Jorge Rodríguez Vives

The case of the Competitiveness Council of the Brunca Region

Costa Rica was the first country in the world to abolish the army, thus allowing the country to invest more in education and health. It was also the first country to reverse deforestation and has been one of the leading countries in setting the pace with a trade liberalization strategy, thereby growing a global market for Costa Rican products. Yet, Costa Rica was failing to create development centres outside of the capital, San Jose, as well as – crucially in the present case – failing to promote development through competitiveness councils in the peripheral regions with the participation of the relevant actors at local and national level.

This chapter focuses on the Brunca region of Costa Rica, where a "laboratory" process took place which, because of the positive results experienced, the Government is trying to replicate in the economically and socially poorest regions of the country, linking the participation of citizens, universities, local governments, the private sector and the government itself.

In order to develop this process the government of Costa Rica has had the support of the Instituto Tecnologico de Estudios Superiores de Monterrey, the United Nations Development Programme (UNDP), the International Organization for Migration (IOM), the Food and Agriculture Organization of the United Nations (FAO), the International Labour Organization (ILO) and UN-Habitat, with support from the Spanish MDG Achievement Fund. This chapter explores why we chose the Brunca region, how the process evolved, and some of the recommendations and lessons learned.

WHY THE BRUNCA REGION?

The main reason we chose to concentrate on Brunca is because this region is in the south of the country, a part of Costa Rica that is characterized by its productive diversity and fertile land, but the competitive environment of which had not been appropriately developed. The Brunca region is one of the priority areas for government action because it has low levels of human development and high levels of emigration. Historically, this region depended on transnational companies operating in the banana cultivation industry which disappeared thirty years ago, putting the region into significant economic downturn. This suggested that the possibilities for investment and private sector development were not optimal.

In Brunca there are six local government authorities (Perez Zeledón, Corredores, Buenos Aires, Golfito, Coto Brus and Osa), none of which had the capacity to combine the challenge of competitiveness with the exercise of decentralization proposed and demanded by themselves. This prevented the local governments' primary aim, which targeted the strengthening of the private sector. Without support, it would be difficult for these authorities to implement the kind of competitiveness policies that each one of their municipalities required. In addition, coordination between the senior officials of each municipality with their respective counterparts was difficult.

One of the most problematic factors we faced was the dismantling of the existing private sector and the absence of public-private and public-private-academic partnerships in the region. This, in practice, was possibly one of the biggest obstacles entrepreneurs had, since each of the actors in the

Public-private partnerships make development processes sustainable. Alliances are guarantors of dialogue and allow making decisions or the benefit of the majority.

region felt helpless because of the lack of instruments to coordinate among themselves.

Another important factor to be considered when approaching the competitiveness environment in Brunca was the lack of accurate information for decision-making. There was a complete misunderstanding of the potential of the region, as studies that were performed on the productivity and competitiveness of the region were not shared even between universities. There was a lot of valuable information, but it was not centrally available. Evidence showed us that this was a problem affecting both big companies and SMEs, and this problem had to be corrected.

Finally it must be underlined that we faced a significant lag in poverty indicators, which were higher than the national average, especially for youth and women. It is possible that the existence of a previous dependency model (with the banana industry) meant that the entrepreneurship level was considerably low, so the supply of credit and services for entrepreneurs and SMEs were not appropriate, especially for indigenous populations and, as indicated, for women and youth. So, in order to start a new model of economic development it was necessary to create a strategy to promote entrepreneurship and to support these groups to improve their production, competitiveness and marketing, both for tourism services and for industry and commerce.

Brunca is the Costa Rican region most assisted through international cooperation, due to its low human development indicators. In order to make the desired impact, there had to be an alignment between the policies of the international organizations and agencies and the policies and strategies at national level. For this reason, we created a coordinated policy with the support of the Agency for Cooperation of Andalucía, the Spanish MDG Achievement Fund and five UN agencies.

WHAT DID WE DO?

To meet the challenges that we had before us, we had an international practice example from the Instituto Tecnológico de Estudios Superiores de Monterrey, which has over 20 years of experience developing regional competitiveness models in Mexico. Knowing this experience motivated us to use the Brunca region as a "laboratory" in order to achieve two objectives:

○ A prioritization of needs and resources for the development of the competitiveness of the Brunca region, called the "Competitiveness Model";

○ Accurate information for decision-making in a participatory manner, leading to the establishment of the Competitiveness Council of the Brunca region.

This chapter will focus on the Competitiveness Council of the region, its origins; its conceptual development in Brunca; and its replication throughout the country.

The business sector of the region was the most affected by the lack of competitiveness, as employers who wanted to generate employment and create businesses could not do it for the reasons explained above. That is why four intersectoral workshops

were convened with the participation of social and business leaders from the tourism, agribusiness, and municipal sectors, as well as the government agencies that were active in the region. Each one of these workshops was a challenge, since there had been some previous experience in this regard, and the local actors were somewhat sceptical about it. After a week of listening to all sectors – their requests and complaints – came the commitment of each part of the local business architecture to participate in this process of consultation and dialogue. With this, the actual work could finally begin.

Each of the sectors designated spokespersons expounding their respective needs, while the

Government committed to undertake a realistic approach to the issues. During this phase we had a very interesting exchange of knowledge and experience as each sector expressed their respective needs. This is a critical factor, as it paved the way for a new relationship and trust between the sectors, based on open communication, coordination, and a commitment to a process in which all had much to gain by working together.

This first round of negotiations gave rise to a basic protocol of what would become the agenda of competitiveness for Brunca, reflecting the priorities of each sector, and looking at short, medium and long term scenarios. This task is represented by figure 3.1

Figure 3.1: Competitiveness of the Brunca region
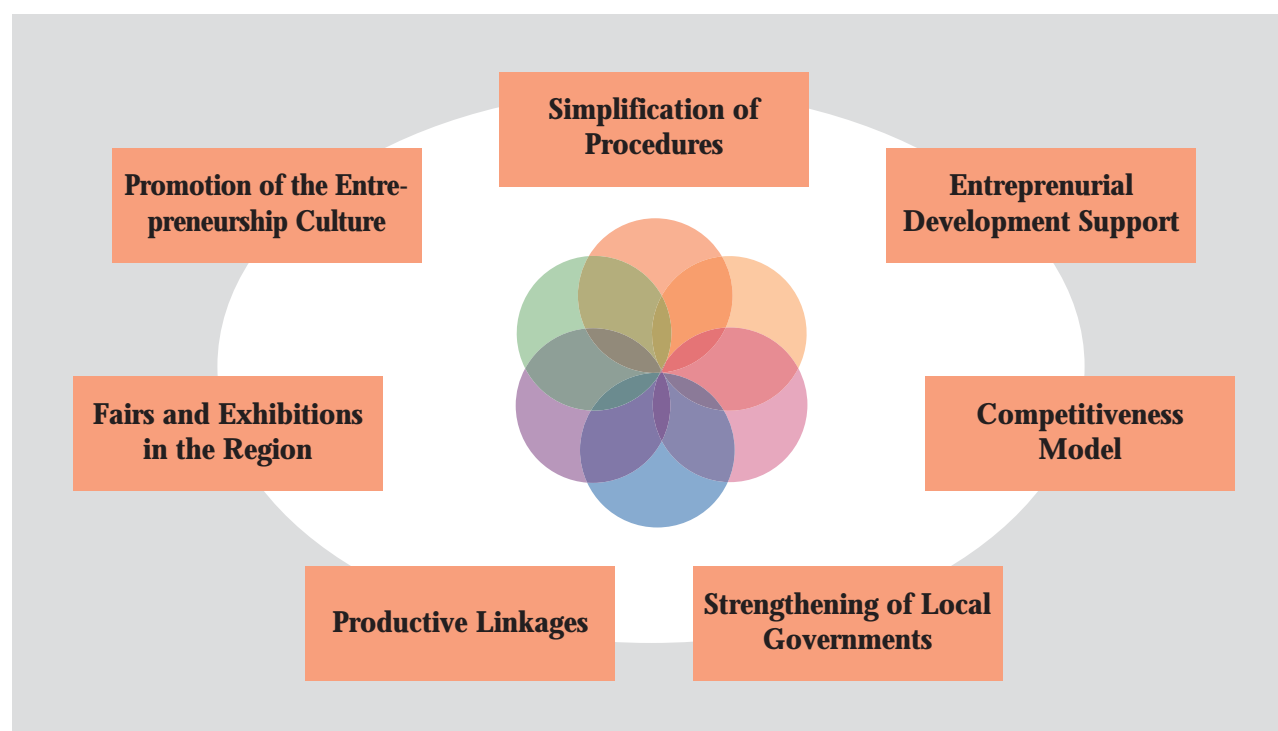
To arrive at decisions underpinned by solid technical information, accurate and reliable data were needed. A Business Directory was therefore updated in order to map the existing business ecosystem in the region. This in turn allowed a first survey of businesses, which guided us towards the strategic sectors for which the Brunca region would hold the most potential, taking into account the need to align supply and demand for services in a business model for the coming ten years. (The official presentation of the results of the business model is planned for December 2012).

The agenda was settled, and this agenda included decision-making related to the Competitiveness Council, how it would work in practice and of whom it would be comprised of out of the six munici-palities, the local government bodies, the universities in the region, spokesmen for the private sector and representatives of the social sectors.

Finally it was agreed that the Competitiveness Council would consist of 120 regular members, 70 per cent of which are from the business sector. The Technical Secretariat, in charge of monitoring the agreements reached at the monthly meetings, fell to the private sector.

Finally, in March 2012 the preparatory process for the creation of the Competitiveness Council of the Brunca region ended with the signature by the President of the Republic, Ms. Laura Chinchilla Miranda, of the decree formalizing the creation of the Council, thus making the Brunca region the first in the country to have such an institution. With this decree a management model focused on joint development, intersectoral dialogue and private sector involvement was established.

This Competitiveness Council is a tool for decision-making, which allows the government bodies to have a single interlocutor representing stakeholders in generating the competitiveness of a region, with the fundamental premise that increased competitiveness can positively impact its socio-economic environment, leading to tangible results in entrepreneurship development, economic democracy and poverty alleviation.

CONCLUSIONS:

The Brunca process presented these main conclusions:

1. The importance of cooperation. It is vital for us to gestate development dialogue with the hope that we can all contribute to the solution of problems, with each of the players contributing from their own competence. This cooperation serves to channel the interests of different actors with different capacities, acting in response to what they have defined as important. This joint is important not only for the public sector, but also for the private sector, the social sectors and the local governments.

2. Public-private partnerships make development processes sustainable. Thanks to such efforts, networks can have a sense of life and opportunity as development indicators in dialogue processes. Alliances are guarantors of that dialogue and allow us to make decisions for the benefit of the majority.

3. International cooperation is a complement to national development efforts, which should be aligned with national priorities. A partnership must have a before and an after with demonstrable impact. Cooperation is important for a country like Costa Rica and should be used in an exemplary manner due to the scarcity of resources to which we have access. For impact to be achieved with the cooperation and support of the actors, the involvement of the private sector is needed, providing accurate data for proper decision-making, supporting SMEs at the municipal level, and helping to advise on simplifying procedures and regulatory reform.

4. The experience of the Ministry of Economy, Trade and Commerce was extremely rewarding because innovation is never easy, but assuming an agenda of development and re-modelling the commercial production potential of the region through ongoing dialogue with the relevant stakeholders created an opportunity to realize alliances to better serve SMEs and entrepreneurs, highlighting the fact that development comes through the union of wills.

3.2
Trading knowledge to improve trade policy:

Johan Adriaensen

An exploration of three trade administrations

INTRODUCTION

Developing countries face difficulties in reaping the benefits from a globalized economy. It has been argued that the numerous internal barriers faced by exporters in these countries are part of the problem. Lack of roads and fully functioning ports, the abundance of red tape and slow bureaucracies and limited legal and administrative capacity are but a few of such obstacles.

As a result, building trade capacity has become a point of focus in many development programmes. Through 'Aid for Trade' initiatives, the OECD, WTO and many national development agencies have donated money to strengthen the ability of developing countries to trade. In recent literature, the success of these programmes have been analyzed and it has been found that among the top five of the reported success factors, three referred to the domestic political economic process by which barriers are defined, remedies are developed and reforms are implemented (OECD/WTO, 2011). The importance of national ownership of policy reforms, the involvement of civil society, and the interaction between stakeholders and government were ranked first, second and fifth respectively. The underlying reasons relate to the importance of knowledge and information in attaining success. To derive the best policy-prescriptions, it is crucial to have a good understanding of the local political economy. Donor organizations often lack or do not have access to such information. As a result they engage with the national administrations and rely on their input to accommodate this deficiency. If such input is limited (or not sufficiently incorporated) the resulting policy

prescriptions are often inefficient, are prone to donor-induced biases and lack the required ownership.

The argument proposed in this section is that to mitigate these problems, it is important to strengthen the knowledge networks of trade administration. The ability of the domestic administration to identify the country's material interests and correspondingly determine priorities for reform are necessary to engage critically and self-assuredly with the demands and suggestions of donors. To do so it is important to gather as much information as possible both within government as well as in society to derive domestic interests. Networks enable the accessibility of (potentially) relevant information for the policymaker. The key actor within this network is the domestic trade administration as it is in charge of setting up and managing the knowledge networks through which it can acquire this information. But what does this imply in practice? How do trade administrations function and how do they obtain this information? Gaining insight into this matter might be a first step in improving the effectiveness of aid for trade.

THE ROLE OF KNOWLEDGE AND KNOWLEDGE NETWORKS

Knowledge on which policy is desirable and feasible is developed both at the level of the state and within society. Bringing this information into the policymaking process, however, requires networks that enable the exchange of information. For a topic such as trade, these kind of networks are extremely important. In most administrations, trade policy touches upon issues that encompass different

ministries. Opening the domestic market to foreign competition affects the interests of the ministries of agriculture and economy as farmers and firms need to confront the gale of creative destruction. Moreover, health issues, sustainable development, investment and product standards now form part of many trade negotiations.

As a result information and expertise is often divided across different ministries and across different agencies. For a trade administration to tap into the wealth of such information, it needs to consult and coordinate with other public actors. The network, linking these actors, plays an important role in the development of good and coherent policy proposals. Such horizontal coordination is, however, not self-evident and has been described as the holy grail of public administration (Peeters, 1998).

But information is also available within society. In the end, domestic firms and their employees are those affected most by the policy developed. Firms and business associations can assess best which barriers hinder them when trying to export. Similarly, they are better positioned to gauge whether the international competition that arises due to the opening of the market threatens their operation. Here again, networks enable the trade administration to make use of such knowledge to improve the formulation of priorities and initiatives to be undertaken. Not every societal interest is equally represented in the policy process. Biases in the mobilization of interest groups are a common theme within the academic literature, as certain societal actors are more able to overcome their collective action problem. Research has indicated that company size (Bernhagen and Mitchell, 2009), expected benefits (rather than costs) (Tovar, 2009) and concentrated (rather than diffuse) effects (Olsen, 1965) facilitate mobilization. Exporters, small and medium sized enterprises and the services industry have traditionally been regarded as having more difficulties in overcoming their collective action problem. Not having information on the interests of these groups can result in policy that overlooks the effect on a –substantial- part of society.

The increasing involvement of non-state actors in the determination of public policy has led to statements about the 'retreat of the state' (Strange, 1996) or 'governance without government' (Rosenau and Czempiel, 1992). The trade administration, however, is not a passive aggregator of such interests. Rather than a declining role, the regulatory turn in trade policy requires a strong government whose role has merely shifted. This new role implies governments to support and manage the different governance

arrangements that constitute the policymaking process. According to Bell and Hindmoor: *"[Its functions] include overseeing, steering and coordinating governance arrangements; selecting and supporting the key participants in governance arrangements; mobilizing resources; ensuring that wider systems of governance are operating fairly and efficiently; and taking prime carriage of democracy and accountability issues"* (Bell and Hindmoor, 2009: 155). Through so-called 'meta-governance', the administration can identify weaknesses in its knowledge network, and, correspondingly, define a course of action to remedy this lack of information. The incorporation of private actors that are less able to overcome their collective action problem within the policymaking process is but one example. Acknowledging other ministries' expertise in certain sub-domains of trade policy through the valuation and fostering of their contribution to the policy process is another example. The main idea is that administration can engage in such meta-governance and in so-doing improve the quality and strength of the knowledge network on which they can depend.

STUDYING TRADE ADMINISTRATIONS

Through an exploratory case study I look at the functioning of the European, Spanish and Belgian trade administration. This analysis is based on desk research and 12 interviews conducted in the administrations between May and September 2012.

The Spanish trade administration is highly centralized. Trade is located in a large directorate-general within the Ministry of Economy. Within this directorate, different sub-units (SG) each have their own specialization and responsibilities. One specific sub-unit, the SG on the EU, takes up a coordinative function in preparing and managing the formulation of the Spanish position. Other units, such as the SG Agriculture are in charge of specific chapters or issues, in this case trade in agricultural goods. Recently, a new unit has been created to conduct (quantitative) analyzes on the desirability of certain policy proposals for the Spanish domestic economy, enhancing knowledge creation at the level of the administration. Even though boundaries between competencies are strongly respected, the horizontal nature of trade policy necessitates at least some degree of coordination across ministries. This coordination is largely informal in nature and occurs first and foremost at the level of the different sub-directorates.

As trade expertise is located within one large administration, the mobility of staff is important to facilitate the creation of knowledge networks. In the first place this occurs between the different sub-directorates, but opportunities also exist to act as a trade liaison officer in different ministries or be part in the trade delegation of a foreign mission. Personal networks are easily created this way.

Following the strong division of tasks within the trade administration, most sub-directorates have constructed their own network to engage with private actors. There is, however, a fixed list of some 30 sector-wide organizations that are given a privileged status. These organizations are acknowledged as representative of the Spanish interest in a given sector and are therefore consulted frequently for defining the Spanish interest in trade policy debates. In recent years, consultations have also been organized with civil society.

By contrast, the Belgian trade administration is characterized by a strong degree of fragmentation. Competencies on trade are divided across different ministries and across the federal and regional level. One small unit within the Ministry of Foreign affairs is responsible for coordinating the Belgian position. For each trade policy discussion, input is requested from all ministries (both at the federal and regional level) although participation is often limited to some 10-15 people. Each contributes according to their own expertise. The Ministry of Economy plays a special role as it retains much of the technical expertise and is involved in a number of council working groups and responsible for matters related to trade defence. They initiated the organization of Inter-ministerial Economic Conferences (IEC) to prepare a first draft of the Belgian position in international trade negotiations, as they wanted to make the best use of their knowledge. The flexible organizational model also allows for ad hoc inter-ministerial working groups as was the case for the Anti-Counterfeiting Trade Agreement.

Consultation with civil society is the responsibility of each contributing ministry. Each ministry relies on a network with business associations that can help in the formulation of the Belgian position. The Flanders Ministry for example has authority on trade promotion and has sought to integrate the expertise its agency (Flanders Investment and Trade) has on the identification of market barriers abroad. The Ministry of Economy has the IEC's as mentioned earlier, but also has the ability to contact different firms through a large register of companies.

The European administration is a mixture of both systems. It has a strong lead administration in the Directorate General (DG) on Trade but is also characterized by a strong emphasis on coordination between different public actors who enjoy a certain degree of authority in their respective fields of expertise. While DG Trade is in charge of trade negotiations, it is common that other DG's participate in the negotiation team and often lead the negotiation for specific chapters in which they have most expertise. Through the increasing use of policy evaluation, impact analyzes, and management plans, knowledge generation at the level of DG Trade has also been enhanced over the last decade. In addition to the different DG's, the Member states also play an important role in providing DG Trade with input through their involvement in the many Council of the European Union working group meetings and the Trade Policy Committee.

While consultation with societal actors mainly took place at the discretion of the Commission through bilateral contacts with different peak associations, we have seen a shift throughout the 2000's when different initiatives aimed at including other societal actors in the policymaking process, were launched. Examples are the Civil Society Dialogue and the Market Access Partnership. The former focuses on the broader civil society organizations (such as Labour Unions, NGOs, but also business associations) to foster the involvement of voices that were largely left outside the consultation processes, the latter seeks to improve the articulation of exporters' interests.

LEARNING FROM THE THREE KNOWLEDGE NETWORKS

From the description of these three administrations, two important lessons can be drawn. First of all, the different cases highlight the large diversity in organizational models used in trade-policy. This diversity is important as it deviates from the isomorphism which we would expect based on the good governance agenda. The differences observed in the cases largely reflect the economic and political context in which policy is being made. The interests of a large and diverse economy such as Spain are better served through a centralized and strictly organized trade administration. In the smaller Belgian economy, the maintenance of such a large administration is inefficient as the potential gains to be acquired are also proportionally smaller. The intensive consultation and cooperation with the sub-national regions/member states in the case of Belgium/European Commission on its part reflect the political context. The overlap of competencies or expertise might seem less efficient as public actors, as the (supra-) national and regional level perform largely the same function. Nonetheless, neglecting such political sensitivities would –at best- result in legitimacy problems and at worst in complete policy-failure.

It is clear that a one-size-fits-all solution would be inappropriate. Each country faces its own economic and political peculiarities which warrant a deviation from a uniform organizational model. This, however, should not incapacitate scholars and practitioners to make recommendations. By focusing on the knowledge networks on which the administration can rely, we can define opportunities for strengthening the policymaking-process by integrating dormant expertise within this network. That is the second finding following from these cases. In all of the cases studied, initiatives were launched by the trade administration to remedy potential weaknesses in the knowledge network. This involves the integration of less mobilized interests within society (e.g. the civil society dialogues in Spain and the EU) or the new public actors in the policymaking process (the export promotion agency in the Belgian case) but also the strengthening and utilization of expertise within the administration as exemplified by the new data unit in the Spanish case, the inter-ministerial economic conferences initiated by the Belgian Ministry of Economy or the impact assessments in the EU's case. Each administration, in its own way has sought to strengthen the knowledge network.

CONCLUSION

The argument proposed in this chapter is that to mitigate problems of ownership, to limit donor induced biases in policy reforms and to enhance sustainability, it is also important to strengthen the capacity of the trade administration. The ability to identify the country's material interests and correspondingly determine priorities for reform are necessary to engage critically and self-assured with the demands and suggestions from donor organizations. Deriving such interests, requires a well functioning trade administration. To fulfil this role, the trade administration can depend on networks both at the level of the state and within societies. However, the trade administration is not only a passive recipient of knowledge, it also plays an active role through its meta-governance, i.e. the administration is responsible for the management and development of those knowledge networks.

◀ *Small industrial businesses make an important contribution to economic development as they contribute to productivity, competitiveness, aggregate economic growth, job creation, income generation, training, the provision of goods and services.*

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3.3
Informal networks in business development services

Ariane Agnes Corradi[ii]

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Case studies from two Brazilian business incubators[iii]

INTRODUCTION

Business start-ups are opportunity-driven businesses oriented to growth and innovation (Altenburg, Eckhardt 2006, Tötterman, Sten 2005). They are initiated by entrepreneurs and characterized by typical potentials and weaknesses. Their potentials refer to the importance of business start-ups to economic development as they contribute to productivity, competitiveness, aggregate economic growth, job creation, income generation, training, the provision of goods and services (Altenburg, Eckhardt 2006, Nichter, Goldmark 2005), and innovation (OECD 2010, Botelho, Carrijo et al. 2007). On the side of the weaknesses, as the literature has pointed out, business start-ups are the most fragile end of the private sector for their difficulties to survive the first years, resulting in high indices of closure (Casson, Yeung et al. 2006, Nichter, Goldmark 2005). This scenario has been associated with a wide range of factors that includes the business environment, the nature of the product market, the value chain, social networks, and individual and intra-firm characteristics (Nichter, Goldmark 2005). Nevertheless, the intricate relationships between these factors are still being investigated.

One of the main business development services designed to tackle these weaknesses is business incubators (Altenburg, Stamm 2004, DCED, 2001). They aim at the first two years of business start-ups, labelled the "valley of death" (see Cressy 2008 [2006]), by providing infrastructure, training, consultancy, and continuous assistance to entrepreneurs. Participants in a business incubation programme share facilities and exchange experiences beyond formal training activities (Altenburg, Stamm 2004, Tötterman, Sten 2005). In other words, through spatial proximity and informal exchanges, these entrepreneurs develop informal networks of trust, in which they exchange critical information. In this regard, networks established within a business incubator become part of the social capital of entrepreneurs, increasing chances of cooperation between business start-ups through informal exchanges of information that can evolve into formal business partnerships or into market relations in which one start-up becomes the provider for another. However, cooperation is not always the case, since network dynamics combine positive and negative forces (Knorringa, Staveren 2007). When they are negative, spatial proximity may increase chances of competition between incubatees who can access competitive information about each other's business strategies, buyers, suppliers, etc., since they share the same network. There can also be manipulation of information favoring some firms according to personal interests of incubator's staff members, and even corruption. When this happens, a business incubation setting may become a niche of cut-throat competitors, with potential losses to all involved. This type of scenario is examined in one of the case studies here.

Alternatively, if informal networks for cooperation are fostered, business start-ups can capitalize on the benefits of this type of social capital. For this to happen, a central figure within these programmes is the business incubator manager. These managers perform the role of information brokers, both within and outside the business incubator setting. As information brokers, they connect different subgroups of the same network by bridging information from one to the other (Cross, Prusak 2002). Here, the business incubation system is considered the whole network. This means managers act as a bridge between entrepreneurs within the programme, developing joint activities, stimulating informal meetings, and valuing informal exchange of information between similar or complementary businesses.

Business incubator managers also act as a bridge between business start-ups and external resourceful actors, such as regulatory agencies, research institutions, service providers (i.e. accountants, consultants), local government, etc. When these networking activities are successful, they can have long-term impacts on local development dynamics for the strengthened capabilities of individual businesses through partnerships and deployment of local resources through networks. As stated above, since there can also be negative impacts of informal

networking, this paper addresses the following question: ***what is the impact of informal networks in business incubation settings for the development of business start-ups?***

The two case studies in this paper provide contrasting examples of impacts of informal network dynamics on business start-ups within business incubation programmes. One is a best case of brokerage for inter-firm partnership and innovation, whilst the other shows how poor management of these networks can be deleterious for incubated start-ups, and, in consequence, for local economic development. It is argued that informal networks, if left 'invisible' by business incubators' managers, may become an additional risk factor to the survival of business start-ups. In addition to this, it is also argued that, alone, there is little a manager can do. Hence, multi-actor governance mechanisms are crucial to compose a scenario of business start-up support that promotes cooperation between entrepreneurs and strengthens local capabilities. This process characterizes a scenario of endogenization of economic development, "the progressive development of local capacities and local control over an export base that was previously shaped by external factors and forces" (Helmsing 2010, p. 13). In conclusion, a network-based approach to business incubation programmes is presented, which recognizes the role of informal networks for the sustainability of business start-ups.

Multi-actor governance mechanisms are crucial to compose a scenario of business start-up support that promotes cooperation between entrepreneurs and strengthens local capabilities.

BUSINESS INCUBATORS AND DEVELOPMENT

A business incubation programme is a business development service designed for individual businesses or entrepreneurs. Business incubators provide operational services that attend daily needs of business start-ups combined with strategic services aiming at enhancing competitiveness capacity in the long-term (i.e. training, consultancy, research and development and technology development) (Altenburg, Stamm 2004). This traditional list of services omits networking activities with resource-rich actors, an aspect of business development services in general that has been increasingly recognized (UNIDO, Leuven Centre for Global Governance Studies 2011, Altenburg, Stamm 2004, Scaramuzzi 2002). Empirical data from business incubators shows that business incubators' managers also tend to overlook the role of informal networking activities, whereas entrepreneurs see this amongst the top services provided by business incubators.

Business incubators can be conceptualised as economic meso-institutions – because they act at the local and regional dimensions – that facilitate public-private interactions (Helmsing 2001). They are part of the local business environment and occupy a central role in networking business start-ups with local and state governments, financial institutions, institutions for business support, research centres, business associations, other local enterprises, etc. They actively participate in the governance structures of these networks mainly in two ways: a) by deploying the existing economic base of the locality or region, and b) by diversifying the local economic base through the insertion of new industries. In this context, cases in Latin America have shown an emphasis on technology and innovation to improve competitiveness. In sum, governance of multi-actor networks at this meso-level has created conditions for collective learning and endogenous development (Helmsing 2001).

Specific comparisons between types of business incubators (e.g., Albert, Bernasconi et al. 2004) distinguish between local economic development incubators and science-based incubators. The former contributes to development through job creation, economic development, and support particular target groups or industries. The latter, being closely linked to research institutions, contribute to development through commercialization of technologies, development of entrepreneurial culture, civic responsibility, and creation of new sources of income. Common weak points between them are a lack of stable resources for sustainability and dependence on the quality of the manager as guarantee for the quality of services.

While other classifications of business incubators (Scaramuzzi 2002, Chandra 2007, ANPROTEC 2012) could apply, here these two categories were chosen because they facilitate capturing key features of business incubators in relation to development. Despite wide variation within each category and overlaps between categories of business incubators, it is important to recognize that different types of businesses will have different contributions to development (i.e. job creation, technological development etc.), demanding relatively different sets of services in order to achieve their goals. This implies for business incubators, different governance structures, and networks to provide the needed resources. The literature highlights some macro aspects of these governance structures, such as national standards, enforcement of laws and regulations, training of future private service providers, etc. (Altenburg, Stamm 2004). In addition to this, local governance is also crucial, since the actors most directly involved in business incubation programmes are local governments, local or regional investors, local or regional business support institutions, etc.. Local governance dynamics in relation to different degrees of involvement by business incubation partners can also affect the effectiveness of the services provided.

THE BRAZILIAN CASE

Despite cross-country evidence that business incubators can help promising entrepreneurial ideas become businesses, business incubation programmes are absent in most developing countries (Scaramuzzi 2002). This would be, per se, a good reason to study enduring business incubation programmes in developing countries in general. In the case of Brazil, specifically, becomes even more interesting for historical and political reasons. First, Brazil pioneered the implementation of business incubation programmes in Latin America in 1984 (Aranha 2008), with the creation of five technological foundations for transfer of technology from universities to the productive sector. This was preceded by a national policy for science and technology concerned with national security and technological autonomy, established after World War I and II and maintained by the military government until the 1970s. The failure of this policy led to a bottom up movement that culminated in the creation of the first incubators, starting at universities. Local initiatives were organized at the national level by associations, which became representative and respected until they gained support from the government and industrial sectors in the 1980s (Almeida 2005).

In addition to this political-historical beginning, the case of business incubators in Brazil is also worth researching for being the fourth largest business incubation market in the world (World Bank infoDev 2010), yet being an emerging economy and one of the BRIC economies. Nevertheless, variation in the distribution of business incubators in the country can be observed. Most of them are concentrated in the most developed states and resource-rich cities. These locations are clearly more propitious to the development of businesses for the availability of resources (Walker 2000).

Within Brazilian economic and industrial policy, business incubators have been considered as one of the programmes of support to entrepreneurship and innovation, under the national Policy for Productive Development and the National Action Plan for Science, Technology and Innovation (2007-2010) (ANPROTEC 2012). Hence, business incubators are a policy tool for sectorial and productive development. They are sustained by public and private sources, combining local, regional and national levels of support. In a recent report, the Brazilian Association of Business Incubators and Science Parks (ANPROTEC 2012) shows that most of the incubators contribute to local development by developing new products or services, generating employment and income and creating new businesses of high quality. This same report indicates that one of the attractive points of business incubators is proximity with other start-ups and opportunity for networking. Results in ANPROTEC (2012) also indicate that most of the innovations are local, highlighting the relevance of these programmes for development at the local level. Nevertheless, there is innovation at the international level in those business incubators that focus on high R&D-intensive start-ups. Empirical evidence from case studies in high technology incubators also support claims that business incubators play a role as regional agencies for innovation and economic restructuring (Botelho, Carrijo et al. 2007).

The role of business incubators in Brazil has been facilitated by the stable economic scenario, improved skills of entrepreneurs in relation to education and professional experience, and specific legislation for SMEs (SEBRAE 2007, 2011). These factors have impacted positively in the survival rates of business start-ups in the country, in the percentage of businesses started by a market opportunity, and in other survey measures by SEBRAE (SEBRAE 2007, 2011). It can be expected, from this promising picture, that there are more incentives to invest in partnerships, a process that depends greatly on informal networking to access and create resources endogenously.

Informal networks, as demonstrated below, can be invisible in the organizational structure (Cross, Prusak 2002). When they are recognized and worked upon by business incubator managers, brokerage through these networks can be a tool to strengthen incubated start-ups. In these cases, business incubators act as information brokers, promoting communication flows between different subgroups that compose the business incubation network. These subgroups can be incubatees, funding institutions, support institutions, research centres, training organizations, etc.

The two business incubators described in the next section provide contrasting examples of informal networks dynamics within business incubation programmes. They are located in a South-Eastern State of Brazil, although geographically distant from each other. This is the most resource-rich region of the country and, therefore, the best seedbed for business start-ups. It contains many buyers, suppliers, support institutions, financial institutions, universities and research centres, and many business incubators. The same national and state level policies thus apply for both cases, making differences between them more likely to be explained by their internal dynamics and interactions with the local environment. Entrepreneurs and managers of both incubators were interviewed about the evolution of start-ups, with emphasis on the access to resources from multiple actors.

THE TWO CASES

The two incubators have been operating for practically the same amount of time, but they differ in scope and network configuration. As table 3.1 summarizes, Incubator A has much larger number of enterprises, with its full capacity occupied, whilst Incubator B has a smaller number of enterprises and uses less physical capacity, with half of its rooms idle. Both incubators work on systems of monthly fees for incubatees and each has its own ranking scheme of charges according to the strength of the business. These schemes aim at building up autonomy and sustainability after the programme. In relation to the administrative structure, Incubator A possesses an administrative body composed of 12 professionals in different functions. In Incubator B, however, the administrative team is composed of the incubator manager and five interns, also performing different functions.

Both incubators count on a large network of local institutions. As expected, in focussing on high R&D-intensive start-ups, incubator A is more connected to the local higher education institutions and research centres. Both incubators are connected to the local government, and to the local commercial and industrial associations. At the state level, Incubator B recently became connected to R&D foundations after joining a consortium of business incubators in its sub-region. The consortium exists to aid applications for governmental grants to business incubators. It is noteworthy that many incubatees in Incubator A benefit at the firm level from grants from the same grant institutions.

In relation to types of firms, Incubator A remarkably incubates start-ups developing products in distinct engineering areas; whereas Incubator B tends to incubate service providers in several areas. It is expected that these differences will impact the packages of services provided by each business incubator (ANPROTEC 2012). Nevertheless, many services are similar between these incubators. The common services are office spaces with infrastructure of water, electricity and internet; reception with secretary; meeting room; entrepreneurial orientation; trainings and courses, specialized consultancies and assistance; managerial follow-up; business consultancy and assistance; technical consultancy and assistance; support for marketing and public relations material. Through partnerships with the local university, both incubators offer access to its auditorium, a library, specialized laboratories, and consultancies by academic staff. Differences between the two packages of services include support for registration of brands and patents and the higher variety and frequency of consultancies and technical assistance in Incubator A, whereas Incubator B reports the identification of grants opportunities and lines of financing, participation in business fairs and sectorial events, availability of technical magazines and newspapers, networks through governmental agencies and investors, etc., in its portfolio of services.

Table 3.1: Characterization of the cases

Characteristics	Incubator A	Incubator B
Time in operation*	8 years	7 years
Number of managers in the last 5 years	2	2
Type of linkage with higher education institution	Federal public university; cooperation relationship	Local private university centre; main financial supporter
Number of incubatees (at the interview)	26	4
Number of graduates (at the interview)	5	4
Number of pre-incubated start-ups (business plan elaboration period)	30	6
Costs for the incubates	Monthly fee for rent and shared facilities. It increases as the start-up progresses, reaching market prices at the end of the programme. This is also a strategy to subsidize the first year entrepreneurs.	Monthly fee for rent + small fee per square meter occupied + shared expenses for facilities
Focus	High R&D-intensive start-ups	Both low and high R&D-intensive start-ups
Local support institutions	Federal university installed in the municipality, local government, local foundation for teaching, research and extension, college of applied social sciences, commercial, industrial and entrepreneurial association, local union of the metallurgical, mechanical and electric material industries	Local agency for economic development, local government, local university centre, local commercial and industrial association, local chamber of shops' managers
State support institutions	SEBRAE, state network of business incubators	SEBRAE, state foundation for support to research, state industries association, state network of business incubators
National support institutions	ANPROTEC	ANPROTEC, National Council for Science and Technology, Financer of Studies and Projects of the Ministry of Science and Technology
Types of incubated businesses	Electronic engineering, electro-medical equipment, food engineering, civil engineering, R&D for automobile industry, technology for intelligence in mobile localization, electronic games, import/export logistics, biodiesel, technological traceability of value chains in coffee and meat, integrated and electronic systems, etc.	Public relations and visual communication, consultancy in food security, commercialization of organic products, technical assistance and consultancy in agro-production
Types of graduated start-ups	Solutions in information technology for enterprise management and internet, training and consultancy in computer networks, built-in software for mobile gadgets, systems for monitoring electric networks, aeronautical equipment.	Satellite monitoring of vehicles, website and intranet design, treatment and disposal of residuals, outsourcing in informatics

*Time counting stops in 2009, when the interviews were conducted.

In order to understand the variation in performance of incubators it is, first of all, important to look at the selection criteria for new incubatees. In Incubator A, the process is based on a business plan that is evaluated by a multi-institutional board. Selection criteria are: a) economic viability; b) entrepreneurial, managerial, and technical capacity of proponents; c) technical viability, technological content, and degree of innovation of products, processes or services; d) potential for interaction with research and development institutions in the municipality; and e) impacts on socio-economic development. In Incubator B, the process starts by a summarized business plan, which is evaluated in terms of market viability. Next, the incubator offers support to the elaboration of the business plan, which is evaluated by a board of examiners in relation to economic, financial and market viability.

Secondly one has to analyze the informal internal and external network dynamics. In Incubator A, internal networks are built through both corridor talks and from formal business relations. These formal relations can be buyer-supplier, the creation of spin-offs, and so forth. This incubator shows a culture of cooperation that is established and kept by its manager, chances of competition are minimized by not having businesses working on the same product or service, and, because start-ups have some complementary competences, they can combine them into new products or services. This environment of informal exchanges promotes also collective learning and mutual cooperation for daily issues, in a process of strengthening informal ties and building social capital.

In relation to networking activities involving external actors, Incubator A offers four activities worth highlighting. First, a venture capital specialist provides weekly assistance to the most promising businesses, preparing them to attract private investors; in addition he provides occasional guidance to other incubatees. Second, Incubator A provides visitors (i.e. future incubatees, politicians, media reporters, university professors, etc.) a complete tour to all incubated start-ups. Third, it offers periodic training in applications to seed capital; the best performers present their businesses in a seminar for investment fund representatives. Fourth, this incubator is part of the municipal committee for local policies for private sector development. This is an important point of governance earned through the good performance of graduated start-ups in the local and regional markets.

A contrast to the functioning and development of Incubator A is Incubator B, especially in relation to informal networking in its early years. Incubator B does not offer much internal networking activity, possibly because of three factors: a) small number of incubates and lack of complementarity between businesses; b) low commitment by the host institution; and c) history of misuse of informal networks to benefit individual interests. This negative activity started to decline in 2008, when a new manager was appointed. As a result, some positive outcomes are observed, such as entrepreneurs indicating each other's complementary services to buyers. As a consequence, start-ups are constantly interacting, what reduces errors and saves buyers' time. This 'culture' of mutual indications started disseminating to other start-ups too, also amongst those in the same sector.

In relation to strategies of informal external networking, there is intensive use of information and communication technologies. There is also participation in business fairs in other cities, although less often. Recently, the manager established linkages between pre-incubated start-ups and the local agency for economic and social development. Again, reputation and trust play a role, since the quality of the applications has improved, and expectations about the incubator's services are clearer. Summarizing the case of Incubator B, it can be argued that a) well-managed networking activities can change completely the internal dynamics of an incubator; and b) incubators can be resilient organizations, regaining trust if combining internal managerial competences with a committed set of support institutions.

DISCUSSION

Incubator A offers a best practice case in relation to managing networking activities, with systematic activities that promote internal and external exchanges for business start-ups. There are many cases of cooperation between start-ups, on different levels. The literature on social networks would argue that this process of initially weak ties gradually becoming strong ties (Granovetter 1985) is expected for the proximity between these entrepreneurs, which increases the frequency and diversity of interactions between them (Boissevain 1974). However, as empirically shown by these cases, this process does not happen automatically and is not necessarily positive in relation to the content that is exchanged (Knorringa, Staveren 2007).

Instead, there is need of a central actor to broker relationships between entrepreneurs inside the business incubator and between entrepreneurs and external actors. This role is strongly performed by business incubator's managers, who can, to a certain extent, steer processes of embeddedness and trust building through concrete personal relations that would discourage malfeasance (Granovetter 1985) and foster cooperation. Hence, business incubators can be an enabling environment for business start-ups, enhancing their competences to survive through deploying the positive forces of social capital (Knorringa, Staveren 2007). For this enabling environment to come about, a set of conditions is necessary: a) the attitude of the incubator's manager; b) the diversity of start-ups incubated at the same time; and c) the quality of coordination between business incubator and support institutions.

First, the role of managers in pooling local resources and governing networks was clear in both cases. Managers who act as information brokers provide better services by facilitating exchanges both internally and externally. It is important to emphasize that frequent changes of managers may hamper the formation of these trust relationships, since they require time. Conversely, when the incubator is in a status of stagnation, lack of transparency, and even corruption, changing the manager might quickly result in new internal dynamics that revamp the organization.

Second, in relation to diversity of incubatees in terms of their products and services, this study showed that both having nothing potentially complementary or, conversely, working on the same type of business, can compromise informal exchanges between incubatees. While the need of synergies between incubatees has

been pointed out elsewhere (Tötterman, Sten 2005), this aspect is rarely described in the literature, except when the subject is competition inside the programme (Scaramuzzi 2002). To create such synergies, this research proposes the adoption of a new framework for business incubators that can potentially increase their governance role in local economic development initiatives. This proposal focuses on the selection of complementary business start-ups aiming at balancing specialization versus diversification within business incubators. Note that, on one side, if business incubators adopt a policy of diversification to avoid competition, there is the risk of shallowing services and impoverishing possibilities of informal networking. On the opposite end, if business incubators decide to specialise in one sector, the risk of internal competition increases.

A middle ground framework for business incubators would be to aim at complementarity between products or services, which may involve different sectors and types of businesses (i.e. manufacturing and information and communication). Complementary businesses, benefiting from proximity, scope and potential mutual interests, could establish networks and partnerships (Koch, Stahlecker 2006). In this framework, the needs of current incubatees could be mapped to inform targeted calls for new start-ups that would fit those needs. Knowledge exchanges between these actors, then, would contribute to creating innovation through cooperation. The proposed framework explicitly recognizes business incubators as information brokers and is aligned with claims that networking activities can be more important than infrastructure (Tötterman, Sten 2005) in incubators' portfolios. This aspect is empirically supported here by the similarity between packages of services in the two cases in comparison to the disparities observed in their networking dynamics.

Two challenges may follow from this approach. The first is lack of local suppliers for the needed resources. Here, regional networks of business incubators could raise the coverage of targeted calls for activating other local governance networks. This still may not find complementary start-ups, remaining subject to chance especially in resource-poorer regions. The second challenge is lack of infrastructure to accommodate more start-ups in case of full occupancy, which could be solved through non-resident incubation of local start-ups – a modality of incubation observed in some locations – combined with specific networking strategies.

The third condition for an enabling environment in business incubators is the quality of coordination between business incubator and support institutions. The literature on business incubators in developing countries has emphasized top-down governance systems marked by the strong influence of donors and governments (Altenburg, Stamm 2004, Scaramuzzi 2002). However, results here indicate that the business incubator manager, through brokerage, can assume this central position by pooling local resources within the business incubation setting. This might be partly attributed to Brazil's development status, which is much less dependent on top-down interventions than other countries. It might also be that, as shown here, informal networks as a form of social capital also challenge widespread assumptions by the triple helix approach (e.g., Etzkowitz, Mello et al. 2005), in which business incubator actors have specific fixed roles in different incubation models. Here, good network governance at the local level and led by the business incubator was critical to constructing a cooperative and enabling environment, similar to case studies conducted in developed countries (e.g.Koch, Stahlecker 2006). However, since cross-country comparisons are beyond the scope of this work, the extent to which country level development impacts on the centrality of business incubators as enablers of local development remains as an open empirical question.

CONCLUSION

This paper claims that informal networking dynamics are critical to entrepreneurs in business incubation settings, since these dynamics can give rise to either cooperation or competition among incubated start-ups. The two cases discussed here showed that poor management of these networking dynamics can compromise the provision of good strategic services. Conversely, the systematic management of these dynamics by the business incubators' manager can create a powerful enabling environment. It is important to consider that there is a continuum between the dichotomous relations of cooperation and competition and that multiple agencies are at stake. This means that inside the same incubator, both forces operate at the same time, especially in big incubators. Hence, the role of an information broker such as the business incubator manager becomes bigger in importance.

Business incubators managers, when purposefully investing in the positive forces of social capital circulating in informal networks, contribute to enhance the potential benefits of agglomeration of firms through increased collaboration between actors (Allen, James et al. 2007, Tötterman, Sten 2005). From the passive effects of agglomeration, such as reduced costs and exchange of information, these benefits may upgrade to active actions towards formal business partnerships or relationships (Helmsing 2010).

This research proposes a framework that moves the focus of business incubators from support organizations for individual businesses to a network centre of agglomeration, in which there is mutual trust between key decision-making agents in different organizations (McCann 2006). This could be relatively easily achieved by selecting targeted types of business start-ups that complement needs of current incubatees. Note that this does not imply the creation of sectorial incubators, since this would be too restrictive, given the fact that businesses interact across sectors to access different resources. Furthermore, this proposal does not exclude other initiatives, such as entrepreneurs who want to start a type of business that would not fit the diagnosed needs. In sum, this proposal adds on the current routines of business incubators by offering an alternative that aims at local economic development with lower risks of internal competition between start-ups and keeps doors open to innovative ideas.

A final, crucial point is that this proposal can only come about if there is commitment and governance by the multiple actors involved in business incubation programmes. They would need to position business incubators centrally, a role in addition to their brokerage role. This would fit with the important role local governments have in designing policies that combine local capabilities and entrepreneurial demand, which can include services provided by incubators. Their policies could also potentially cross borders through networks at the regional, national or international levels, to increase the added value of local products and services. In this way, business start-ups would be gradually embedded in streams of knowledge for innovation and markets (OECD 2010) that can only be accessed through cooperation networks.

3.4
KNOW-HOW3000

Thomas Vogel and
Petra Koppensteiner[iv]

Insights from a practitioners' perspective on knowledge management

INSTITUTIONAL SETTING, INITIAL OBJECTIVES AND DESIGN OF THE NETWORK

As the largest Austrian "Non-Governmental Development Organization" (NGDO), HORIZONT3000[v] has been engaged in development cooperation for more than four decades, relying on two instruments as main pillars of its work: the framework programme for technical assistance and the framework programme for co-financing.

HORIZONT3000's core business is capacity development for local partner organizations – mostly Civil Society Organizations (CSOs) in Latin America, Africa, Asia and Oceania. The Knowledge was traditionally provided, especially through the programme for technical assistance, as a one-way-road from North to South. But already in the 1990s, this traditional pattern was questioned, modalities of cooperation changed, and at the end of the first decade of the 21st century, it was evident that most of the knowledge processed and used in the cooperation between HORIZONT3000 and its partners was generated within the community of southern partners itself. Successful co-financing projects would then very often rely on peer learning processes among partner organizations in the South, and the technical assistants sent out by

HORIZONT3000, rather than actually representing sources of knowledge themselves, had turned to become facilitators of learning- and change processes, mostly in the field of organizational development, for the local partner organizations. Therefore, in 2009, when formulating the 3-year co-financing framework programme 2010-2012 with the Austrian Development Cooperation (ADC), HORIZONT3000, in order to adapt its strategic approach to the changed environment of NGO development cooperation, undertook radical changes in its approach to cooperation: The core business of implementing capacity building projects was complemented by a separate set of activities for KM which came to be known as KNOW-HOW3000.

STRUCTURE AND METHODOLOGY OF KNOW-HOW3000

As outlined above, an important underlying assumption for the design of KNOW-HOW3000 was that, on the one hand, after years and, in some cases, decades of engagement in development cooperation, many partner organizations had accumulated much knowledge – which, on the other hand, was hardly shared and, even less, put in practice by others. Thus, the idea was to design an array of activities and events which aimed at identifying, analysing and sharing innovative and useful instruments and methodologies (so-called "good practices") throughout the network of partner organizations within HORIZONT3000's co-financing framework programme.

An important underlying assumption for the design of KNOW-HOW3000 was that, on the one hand, after years of engagement in development cooperation, many partner organizations had accumulated much knowledge – which, on the other hand, was hardly shared and, even less, put in practice by others.

To that end, the team in charge of KNOW-HOW3000 planned the following specific activities:

○ Systematic analysis of project activities in order to identify innovative and promising methods and instruments with a specific potential for replication in other socio-cultural contexts;

○ Presentation and discussion of the identified "good practices" to the wider community of local partner organizations in so-called regional conferences (1st stage) in Africa and Central America and, (2nd stage) in global conferences in Vienna;

○ Systematization of the most interesting "good practices" ("Systematization" is a methodology for participatory reflection of past experiences in order to learn for the future. See box below for a more detailed description[vi]);

○ Design and implementation of an Intranet platform for the exchange of documented good practices, manuals and tools.

The relationships and interactions between HORIZONT3000 and its partners worldwide, and among the partner community, already represented a network since cooperation began. But the specific KM measures within the co-financing framework programme of HORIZONT3000 transformed this existing network into a KM network. In the current implementation period 2010-2012, this KM network involves:

○ HORIZONT3000 and the 7 constituting member organizations in Austria;

○ Around 80 local partner organizations (mostly CSOs engaged in sustainable development, but also some Roman Catholic dioceses and parishes, universities and local authorities);

○ Some sector-related research institutions in Austria (Boku University, Technical University of Vienna, Boltzmann Institute for Human Rights);

○ Some like-minded Austrian NGDOs with similar sector priorities;

○ The ADC unit for support to CSOs.

To a lesser extent, exchange occurred also with the sector-related units of ADC, Austrian MFA, and of the Austrian NGO platform "Global Responsibility".

SYSTEMATIZATION – PARTICIPATORY KNOWLEDGE GENERATION

Systematization, a concept developed in Latin America since the 1960's, is usually realized in five steps:

1) *The Framework:* The targets (what is the intention of the systematization?), the extent (which parts of the experience should be systematized?) and the central questions are to be identified at this very stage.

2) *The Context:* Secondly, the various contexts of the project have to be identified and written down.

3) *The History of the Project:* In this third stage, the history of the project is written – it is important to describe the real course of the project, not the planned one. At this point, the main focus is on what happened in the past and especially how it happened – Analysis or evaluation should be strictly avoided.

4) *The Critical Analysis:* Now it is time for questioning the history of the project. But the point of this analysis is not an evaluation of the activities, but an understanding: "Why have we done what we have done?". The more insight we gather out of the practical experience, the more it will be possible to identify learned lessons – and therefore create knowledge.

5) *Sharing Experiences:* The experiences of a systematization process should be transmitted to other people so they can benefit as well. This can be done in various forms – in print, via internet, by creating movies or radio programmes.

Through reflecting and critically analysing (interpreting) the own practical experiences knowledge can be extracted. Indispensable in this process is that analysis of experiences and construction of knowledge is done exclusively by those who participated in the activities. No external experts are admitted to analyse and evaluate the project and generate knowledge from their point of view.

When developing the KNOW-HOW3000 project, the team in charge came up with the idea to introduce the concept of systematization to the African and Asian partners in the programme, too. The underlying idea was to establish systematic collective reflection on activities in the past in order to generate insights and to "scan" institutional memories all over the network for good practices.

A total of 19 "good practices" have been systematized in 2010 and 2011. Impressed by the insights reported by the partner organizations, the team in charge of KNOW-HOW3000 decided to carry out a special systematization on the process of design, implementation and steering of the KNOW-HOW3000 project itself, and although the final document is not finished yet (it is scheduled for spring 2013), the various discussion sessions already produced much insight into successes and setbacks of the programme that had not entered the formal reporting system.

Box 3.1 Systematization of KNOW-HOW3000

PERFORMANCE ASSESSMENT

Used to the instruments of Project Cycle Management (PCM) required by most public donors of Development Cooperation, HORIZONT3000, in order to assess the performance of its KM project, formulated expected results, and, consequently, Objectively Verifiable Indicators (OVI) such as:

○ Number of "good practices" identified, assessed and documented;

○ Number of shared "good practices" successfully adapted by other partners;

○ Access to knowledge exchange via Intranet;

○ Knowledge of southern partners about the elements of the KNOW-HOW3000 initiative and effective use of their possibility to participate in the further development of the programme.

As the most meaningful measure for progress in an initiative aiming at generating and sharing knowledge, the team in charge of KNOW-HOW3000 took a close look at the number and kind of "good practices" which were, after being identified, analyzed and shared, effectively taken over by other partners in the network. A lot of detailed monitoring and reporting was carried out in order to analyze and document what kind of knowledge was generated and shared, and how all this happened.

For a quick overview over the knowledge elements shared during the first two years of implementation of KNOW-HOW3000, table 3.2 shows some key information extracted from the KNOW-HOW3000 annual report 2011:

The methodology of systematization of KNOW-HOW300, which was originally developed by partners in Latin America, turned out to be tremendously successful in Africa, and the diffusion of knowledge once stimulated by regional and global conferences developed its own dynamics.

Table 3.2: Overview over the KM elements that have been shared within the KNOW-HOW3000 network

KM Element / Good Practice	Origin and Description of sharing process	Extent to which it was taken over by other partners in the network
Systematization – a participatory process of generating and sharing knowledge	○ Training sessions on the method of systematization ○ Publication of sharing documents (print, DVD or online) ○ Presentations at regional and/or international conferences	○ Partners trained on the method are implementing systematizations ○ Partner organizations outside of this programme also benefitted from the knowledge and took it into their own programmes ○ Some partners presented non-systematized experiences at regional and int. conferences, but applying the structure of systematization reports
ERI (Enabling Rural Innovation[vii]) an approach to rural development	○ Training sessions on the method for project partners ○ Exposure visits for project partners ○ Presentations of the method at regional and/or international conferences	○ Project partners can replicate their knowledge in trainings for farmers ○ 5 project partners in East Africa decided to take over the method from 2013 on ○ Pilot projects for replication in West Africa in 2012
EcoSan toilets (dry toilets for arid regions)	○ Presentation at regional conference	○ Some project partners have taken up the new technologies after their presentation.. For instance DESECE has decided to use EcoSan toilets instead of pit latrines for their new office buildings.
Meta-systematization on community promotion strategy	○ Presentation at regional conference	○ One partner organization in Guatemala has integrated some parts of the presented and discussed community promotion strategy into their project intervention.
Participatory management of natural resources	○ Specific trainings on methods ○ Exchange visits for technical and methodological knowledge-sharing	○ Within the Senegal country programme, knowledge transfer on participatory management of natural resources (code of conducts for environmental protection) has taken place from one organization to at least 3 others.
Climate change adaption	○ Exchange visits ○ Presentation at regional conference	○ A visit of Senegalese representatives to South Africa led to an action plan of the respective CSO in Senegal to stronger discuss and integrate climate change in schools and district councils.
Curriculum for the integration of men in women's rights education	○ Specific trainings on methods ○ Exchange visits for technical and methodological knowledge-sharing	○ Three project partners ACA, STIPA and DESECE produced a joint curriculum for the integration of men in women's rights education.
Sustainable organizational development	○ Specific trainings on methods ○ Exchange visits for technical and methodological knowledge-sharing	○ One project partner (Entasekera) has improved its capacity for sustainability organizational development after receiving technical assistance from another FP-TA project in Uganda

After the second year of implementation of the KM initiative, the reports as well as an external review and the systematization documents confirm that the overall attainment of the expected results of the programme, as formulated in the programme document, are very satisfactory; especially the number of good practices identified, analyzed and successfully shared, was surprisingly higher than expected – note that Table 3.2 only shows those good practices that have been actually taken over by other partner organizations. The number of good practices just identified, discussed and documented on the various occasions for exchange is by far higher.

SOME POSITIVE SIDE-EFFECTS MATERIALIZED:

○ The intensified cooperation strengthened relationships between the different partners in the network; the intensity of content-related discussions increased notably, and some kind of community feeling arose and grew. The understanding of the importance and the potentials of KM increased considerably among the decision-takers relevant for KNOW-HOW3000, who approved an almost 50 per cent increase of the budget for KNOW-HOW3000 for the next 3-years period 2013-2015; some KM-tools introduced through KNOW-HOW3000 were adopted even by other initiatives not directly involved in the original KNOW-HOW3000-network[viii].

○ KNOW-HOW3000 had a positive motivating effect. Key staff involved in the programme unit accepted to do an enormous amount of extra hours, and most representatives of participating organizations involved reacted with similar enthusiasm.

And there were even some unexpected positive side-effects: The methodology of systematization, which was originally developed by partners in Latin America, turned out to be tremendously successful in Africa, and the diffusion of knowledge once stimulated by regional and global conferences developed its own dynamics – there was increasing South-South exchange and networking among local partner organizations without direct interaction of HORIZONT3000.

Of course, a detailed analysis of the performance of KNOW-HOW3000 revealed not only success, but also some setbacks.

First, there were delays, and even cancellation, of some activities due to substantial underestimation of the human resources necessary to carry out the programme. As KNOW-HOW3000 introduced a number of new instruments and activities with which neither HORIZONT3000 nor the involved partner organizations had sound experience, the resources necessary for their implementation could not be precisely estimated at the time the programme was planned and budgeted.

Second, due to lack of expertise on IT and efficient content management technology, it took the team too long to discover that the existing IT environment of HORIZONT3000 was inappropriate for the planned intranet solution and to decide on the necessary structural changes. As a consequence, KM via intranet did not effectively take place until ends of 2012.

The third issue underestimated was institutional communication: Although championing in generating and sharing knowledge with external partner organizations throughout the network, the team in charge of KNOW-HOW3000 unfortunately did not manage to keep the staff within HORIZONT3000 and the member organizations adequately informed about the initiative at all stages, which, in turn compromised sometimes acceptance and support for the new initiatives.

INSIGHTS: LESSONS LEARNED FROM KNOW-HOW3000

Looking back and reflecting on KNOW-HOW3000 as a case study in the wider context of current research on knowledge networks, some interesting observations can be made:

1. FACE-TO-FACE-EXCHANGE VERSUS IT-BASED CONTENT MANAGEMENT

In terms of identifying, sharing and supporting the adaptation of good practices throughout a wider network, KNOW-HOW3000 proved successful overall. Remarkably, however, as reported above among the major setbacks, the content management system via internet that was judged indispensable for KM from the very beginning - and is still demanded by many partners in the network – has not yet gone online. The team in charge of KNOW-HOW3000 finds this regretful because, there is no doubt that much information can be easily exchanged via that channel, to the additional benefit of the partners involved. The success story outlined in Table 3.2

provides solid proof of the notion already acknowledged by several researchers: that *"in contrast to information, which is defined as self-contained facts, knowledge is conceptual, a unique combination of facts that interact in intangible ways"* (Amsden, 2001, p. 3). It is estimated that *"[…] as much as 80 per cent of knowledge residing inside institutions is thought to be tacit and thus hard to share except face to face"* (Serrat, 2008). Or, as one technical advisor[ix] once put it:

"Learning takes place when people come together. It is the encounter with others that makes people reflect upon their own knowledge and convictions. By confronting with others, people complement and fine-tune their knowledge."

The authors were amused to learn about the survey undertaken by Latinobarómentro throughout Latin America on the question *"How do individuals share knowledge?"* that came down to the striking answer: *"they ask friends."*(Acs&Szerb, 2010). Consequently, while content management solutions via intranet must not be discarded, due importance (and resources) must be given to the component of face-to-face exchange fora, since they are the places where important elements of learning occur.

2. THE ROLE OF ENTHUSIASM IN KM

Among the risks and assumptions, the authors of the funding proposal of this initiative expressed the fear that some members of the partner community might be reluctant to respond to the invitation to engage in exchange activities and share their knowledge. This fear appeared legitimate, considering that, first, the participating organizations would have to commit some of their own human resources which could not be covered by the budget of the KM initiative and, second, some representatives might hesitate in discussing openly their strengths and weaknesses, and taking their experiences to conferences which might be perceived as competitions for "best" practices in a given field. But after two years of implementation, it became evident that the enthusiasm of the participating organizations for sharing knowledge turned out by far higher than ever expected:

"Participating in the workshop on systematization has lit a flame within me which will keep me going," said Jennifer Okusia, by that time programme assistant in the Regional Office of East Africa, on a KNOW-HOW3000 seminar in May 2010. Or, as another participant put it: *"This programme makes us feel part of something bigger, to share our ideas with like-minded colleagues in other countries, and,*

what counts most, we feel we can really exercise influence on how those projects are designed and executed." (Malick Ba, staff of the NGO Symbiose in Nioro/Senegal, January 2010).

The case study strongly confirms the results of the surveys reported by several authors which found *high levels of enthusiasm for knowledge management* (Syed-Ikhsan& Rowland, 2004; Singh Sandhu et al., 2011). A positive side-effect in well-endowed national and international public bodies and in the corporate world, this feature develops fundamental importance in the NGDO-context, characterized mostly by very scarce resources, and where intrinsic factors account for the biggest part of the motivation challenge[x].

3. QUANTITY AND QUALITY IN ASSESSING PERFORMANCE IN KNOWLEDGE NETWORKS

Research on knowledge networks, especially on scales as big as the international level, typically focuses on quantitative indicators to assess "connectedness[xi]" which represents the intensity with which actors engage in networking, (and translates into the volume of information exchanged, the number of meetings held, etc.). There is nothing wrong with this approach, since, first, several well-performed studies reliably prove a positive correlation between those quantitative indicators for connectedness and network performance, and, second, especially in the case of a large and complex network, it is hard to collect and empirically analyze qualitative information. But the very small and well-documented case of KNOW-HOW3000 allows a closer look on how exactly knowledge was shared at various moments.

Obviously, connectedness comes at a price which applies to all actors who engage in knowledge networks, but it is especially the small NGOs with very limited resources that have to evaluate carefully how much connectedness they can afford, in addition to their core business. A colleague working in another Austrian NGDO once summed up his frustration in the following statement: *"We observe that our target groups are sick and tired of conferences and exchange meetings. People are transported around the globe, just to end up yawning in tedious powerpoint-presentations and boring discussions. It's an enormous waste of resources! We have taken a very critical position on all kinds of 'conference tourism'".*
Surprisingly, the success story of KNOW-HOW3000 in terms of knowledge management (identifying, analysing, adapting "good practices" to new

contexts) took place although the basic structural and quantitative features of the network did not change significantly between 2009 and 2012. Of course, from 2010 on, various specific activities and events took place to generate and share knowledge, but if the overall travel mileage and event permanence of all people involved in KNOW-HOW3000 were summed up and if the annual figures for the years from 2010 to 2012 were compared to those before the start of KNOW-HOW3000, (HORIZONT3000s development cooperation always involved various types of meetings and communications), no remarkable difference would show from 2010 on, to account for a quantitative correlation with the increase of knowledge successfully exchanged. What made the difference in the case of KNOW-HOW3000 was not the quantity, but the quality of interaction in the network.

"After 40 years of adult education, I can share the following experience with you: Of, let's say, 100 people who participate in an event, 90 walk away, without any change in mind or behaviour. Maybe 10 return to their working environment and actually put in practice something they learned. And, sometimes, there's one fellow who returns home and changes the world! And that's why I always kept doing it[xii]."

What have been the main qualitative elements that account for the performance of KNOW-HOW3000? Surely, the long-term-partnerships with local organizations in beneficiary countries played a crucial role, since they provided a basis of trust and openness necessary for in-depth analysis of performance and lessons learned. But, in KNOW-HOW3000, at least as important as trust was methodology: The widespread application of systematizations as instruments for collective reflection turned out a key tool for the creation and sharing of knowledge. And, not less important, the team in charge of KNOW-HOW3000 invested quite some energy in the methodological design of training sessions and exchange events such as the regional and global conferences. Interactive elements, group dynamics and careful elaboration of the agendas made sure the participants not only considered those activities useful, but also fun.

After putting the magnifying glass on KNOW-HOW3000, it appears that quantitative indicators of connectedness can give a good estimate on the conditions under which knowledge generation and sharing *have the potential* to take place – they can be considered *enabling* factors. But the *decisive* factors which determine to what degree of effectiveness knowledge management actually does take place are obviously qualitative.

DEMANDS: WHAT CAN PRACTITIONERS EXPECT FROM RESEARCH ON KNOWLEDGE NETWORKS?

Some current research on knowledge networks focuses on social network analysis. Although limited in explaining how knowledge generation and sharing works and why, these instruments offer useful tools to characterize knowledge networks: The concepts of *centrality, interconnectedness and hubs[xiii]* are very useful in describing how networks are structured (e.g. from genuine "star" to rather decentralized relationships) and how structures evolve over time. The concrete example of KNOW-HOW3000 took shape as almost a genuine star, where HORIZONT 3000, the organization that maintained relationships with all other members of the network, had a high degree of centrality at the very beginning. However, even during the first two years of existence, once brought into contact with each other, some members of the network undertook knowledge exchange activities independently from HORIZONT3000, that way decentralizing the initial structure of KNOW-HOW3000.

Sometimes, organizations have the power to influence, if not even shape, to a certain degree, the networks they work in. In the concrete example of KNOW-HOW3000, HORIZONT3000 took the initiative of stimulating a series of dynamics which, later on, took on their own momentum. Social network analysis can help to understand under which conditions it would be recommended for actors in the network to take on a more active role, and when it is better to leave the initiative to others.

In a future where the leading public donors in development cooperation are committed to increase their support to knowledge management for the benefit of sustainable development[xiv], (e.g. the European Commission, intends to supply, from 2014 on, specific funding for KM initiatives in development cooperation), it is very likely that many NGDOs will initiate further KM activities. One challenge might be to stimulate an *enabling environment* for KM initiatives with a certain degree of *compatibility* rather than mere mushrooming of a multiplicity of initiatives on similar topics, creating separate terminology and procedures, thus ending up in multiple redundancies. In this process, social network analysis can provide useful recommendations for larger actors, which have the power to influence the conditions for the emergence and evolution of knowledge networks, and thereby increase effectiveness and reduce vulnerabilities of those networks.

PART 4:
Exploring the Boundaries of
Knowledge Network Governance

Introduction

This sections attempts to dig deeper into understanding how and to what degree knowledge networks differ.

The case studies presented in part 3 detail networks as they occur in four distinct environments. This sections attempts to dig deeper into understanding how and to what degree knowledge networks differ. This task in turn exposes factors that influence network formation, a network effectiveness, and a network's capacity to manage and create knowledge. Here, attention moves to knowledge networks. Knowledge networks foster the flow of know-how, learning processes, and management practices. Within these capacities we see how the design and management of knowledge networks can inspire private sector development. The contributions in this part reflect on these issues and provide key insights on network governance.

Jacint Jordana provides the first contribution to this section. His contributions focuses on the impressive growth of regulatory agencies across policy sectors in most countries from the OECD. Regulatory agencies are explored here, as they act as nodes in a network. In focusing on how regulatory agencies collect and distribute relevant information to interested parties, this piece demonstrates the capacity for quasi-government organizations to help overcome information disadvantages, which often decreases performance of pertinent sectors. This contribution points to the central role played by regulatory agencies in a global knowledge network. The contribution from Ettore Bolisani and Enrico Scarso follows, shifting the focus from regulatory agencies to inter-organizational knowledge networks. Their research identifies a host of new challenges for business management and policy-making, and sees knowledge networks as a

potent solution for many of these issues. Various typologies of knowledge networks are parsed out in this piece, as are the factors that influence knowledge sharing among firms. Doing so indicates that within knowledge networks, the success of one network member influences the success of a single company in the network. Ana Aleksić Mirić authors the third contribution to this section and focuses on barriers to learning in business network forms of governance. Her research emphasizes that not all knowledge networks are learning networks, and, concentrating on the intra-organizational and inter-organizational level, that network design (and redesign) can improve learning flows across the network.

Turning attention to international networks, Timothy Meyer's research concentrates on the governance systems best capable of transferring scientific information. His research presents networks as a middle way between markets and hierarchical governance architectures, keenly noting that there are costs associated with both markets and hierarchical types of architecture. In this way, there are instances where networks (as opposed to markets or hierarchies) are the most efficient in terms of costs, but such is not always the case. A case study focusing on the International Renewable Energy Agency (IRENA) serves to exemplify the author's proposition.

Human capital and knowledge retention is the subject of Orly Lobel's contribution. Like the contribution by Ana Aleksić Mirić, the author treats hurdles for knowledge network creation. Recognizing recent, significant changes in economic structures, the author investigates the way knowledge flows can contribute to innovation and explores the barriers preventing knowledge flows between firms. Intellectual property issues are at the core of arguments presented, as overprotection of such rights impedes the improvement of a given idea, technology, or practice. Encapsulation of human capital results, thus impeding knowledge network formation and inhibiting innovative behaviors. The implications of this contribution are profound for international knowledge management.

Michele Clara of UNIDO rounds out this section and incorporates the perspective of policy-makers on the subject of knowledge networks. Significant challenges threaten industrial development, and this contribution presents arguments for a realignment of the academic debate of growth and development that embrace industrial developments' potentials. UNIDO's member states, sensing the need for such a shift, are rallying around the idea of knowledge networks as a mechanism for overcoming barriers to private sector and industrial development. An approach that crosses the international, inter-organizational, and inter-organizational network levels is stressed, and multilateral organizations such as UNIDO serve as key players in networks dedicated to improving global industrial development.

Overall, these chapters paint a complex picture of knowledge networks and depict a complicated system of actors. But in each contribution lie insights with the potential to inform knowledge network construction and maintenance; as a result, these are findings that pave the way for policies supporting successful private sector development. Though these networks prove to be intricate, these contributions demonstrate that knowledge networks hold the potential to mitigate traditional governance hurdles and pave a path for effective industrial development through private sector growth.

Human capital and knowledge retention are the subjects of Orly Lobel. She investigates the way knowledge flows can contribute to innovation and explores the barriers preventing knowledge flows between firms.

4.1
Between national and global

Jacint Jordana

The nodal role of regulatory agencies in transnational governance

The establishment of regulatory agencies has been a highly significant institutional innovation for most national states during recent decades, both in developing and developed countries. These agencies were seen as specialized units with the public realm, capable to implement sophisticated policies based on regulatory instruments – in most cases granted with supervisory and sanctioning powers. This wave of institutional creations included also often the granting of strong organizational autonomy to regulatory agencies vis-à-vis the traditional state apparatus and the political executives, and added also many political delegation characteristics. They included fixed-term mandates, provisions to prevent the dismissal of staff as a result of regulatory decisions, successive reappointment of board members, and so forth, in order to limit political influence on the decisions of the agency (Jordana and Levi-Faur, 2004; Christensen and Lægreid, 2007; Gilardi, 2008).

These agencies reached a global dimension during the nineties, driven by multi-dimensional diffusion processes related to emerging transnational networks of professionals involved in regulatory governance. Such networks were based on different layers of transnational activity. On the one side, academic and policy-oriented networks disseminating information and "best practices" about how to steer different policy sectors, particularly those experiencing significant changes in their governance (i.e., telecommunications or electricity). On the other side, transnational networks of government officials articulated around the activity of international organizations, as for example the European Union, the OECD or the World Bank, which promoted

newly designed standards of institutional innovations and policy changes to implement country reforms in particular policy sectors (Levi-Faur, 2011; Jordana et al., 2011).

In general, external pressures and foreign models facilitated to large extent regulatory agency diffusion, but domestic policymakers were often decisive in determining their institutional characteristics in each case. Democracies, in this sense, were more prone to establish autonomous regulatory agencies than non-democratic regimes, meaning that introducing some fragmentation of regulatory power does not alter the legitimacy of democratic regimes. Also, Meyer and Rowan (1977) argued that diffusion represents largely a process of decoupling, where some foreign aspects of institutional innovations are adopted "ceremoniously", while local processes determine concrete details. Accordingly, the rapid adoption of regulatory agencies in most countries fits well within this pattern. We find that some salient issues, like its political independence, were more extensively diffused than other less visible aspects.

In addition, important variations exist among sectors in the diffusion of regulatory agencies. Graphs 4.1 and 4.2 illustrate clearly that while in the financial area, almost all countries in our sample (Latin American and OECD countries) completed the expansion of regulatory agencies to all sectors in the area, in the area of social regulation the expansion of agencies was quite limited in most sectors – although the starting point a few decades before was very limited--. In the utilities area, regulatory agencies were almost non-existent at the end of the seventies, but here probably isomorphism and convergence

reached their highest levels, and regulatory agencies mushroomed, becoming fully operative worldwide in least than a decade in sectors like telecommunications or electricity. Soon after, well-established networks of regulatory agencies started to emerge at international levels, although these agencies operated embedded in global regulatory regimes weakly articulated. In other sectors, particularly related to social and risk regulation, the diffusion of regulatory agencies displayed a more limited scope, and local-global dynamics were not dominated by networks of regulatory agencies. The diffusion of the new regulatory state also have opened new areas of regulation outside the principles of market efficiency, for example guaranteeing civic and democratic rights (like information rights, human rights protection, electoral rights, etc.), by means of newly specialized agencies in different countries.

Graphs 4.1: Policy sectors in which a regulatory agency operates, 1979 (15 sectors, 48 countries)

Regulatory Agencies Diffusion – 1979
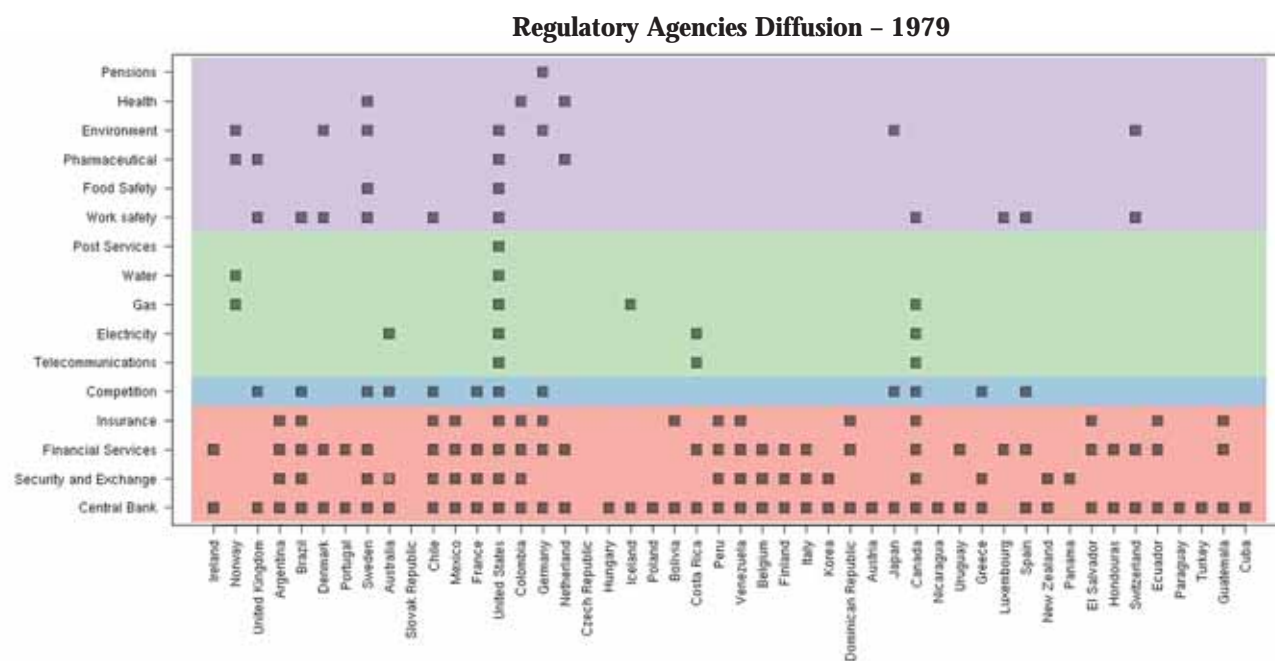
Graphs 4.2: Policy sectors in which a regulatory agency operates, 2007 (15 sectors, 48 countries)

Regulatory Agencies Diffusion – 2007
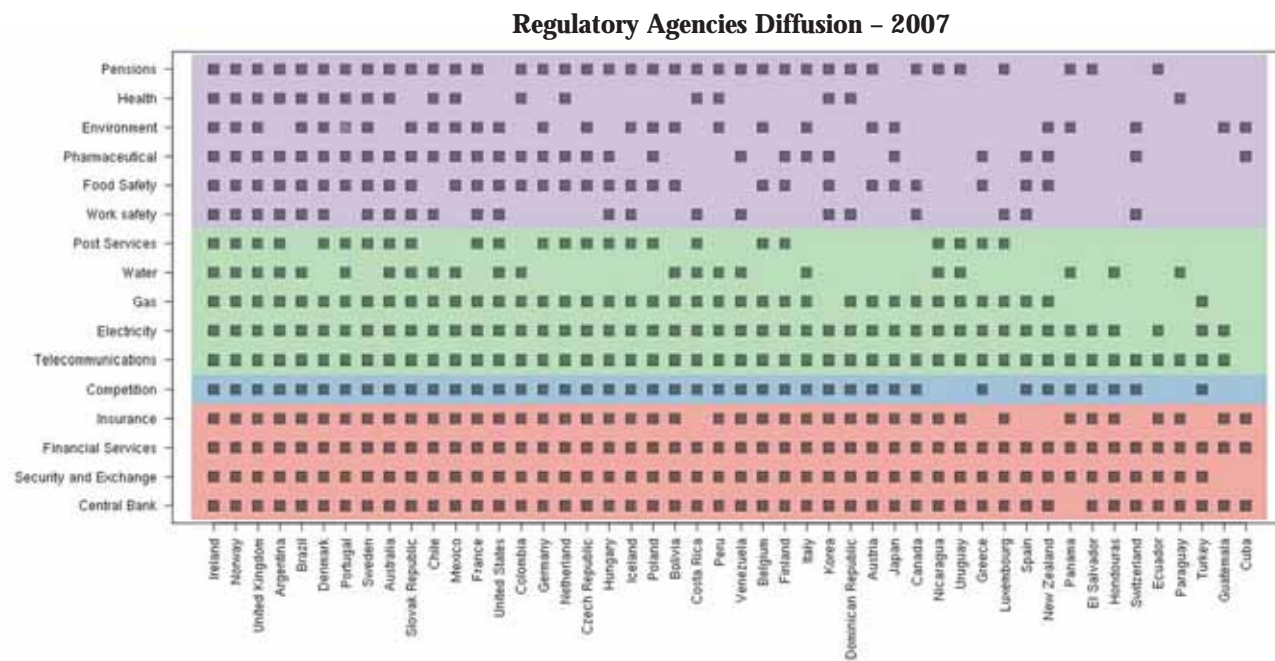
Source: Jordana, Levi-Faur and Fernandez-Marin (2011). Methodological annex.

After their diffusion in the last decades, regulatory agencies are now a tangible reality in most countries in the world. They are important actors in domestic policymaking processes, often with a high visibility. In fact, they are public administration units, inter-acting with other institutions such as ministries or parliamentary chambers, but also internationally well connected to similar institutions in other countries. In addition to their institutional design, regulatory agencies rely on their strong professional bureau-cracies, which try to establish long-term organiza-tional patterns with stable preferences. In this sense, to strengthen their identity, these bureaucracies attempt to be politically differentiated from the actors who seek to control them, either politicians or organized interests, establishing a network of private and public supporters and sympathetic audiences to increase to costs of policy conflicts for opponents. As Carpenter suggests, in such cases "autonomy prevails when agencies can establish political legitimacy –a reputation for expertise, efficiency, or moral protection and a uniquely diverse complex of ties to organized interest and the media –and induce politicians to defer to the wishes of the agency even when they prefer otherwise" (Carpenter, 2001: 4).

Regulatory agencies are also important, beyond their specific tasks, in moving forward the reconfiguration of state structures in the age of globalization (Slaughter, 2004). In such a context, traditional administrative apparatus are transforming very fast, abandoning most of their hierarchical structures and progressively emerging as a set of interdependent structures, which involve different types of monitoring relationships and transactions between them. In this sense, regulatory agencies can be also understood as institutional solutions to the problems related to the management of the regulatory capitalism. Regulatory agencies are based on professional identity and knowledge-based orientation, and combine political delegation with organizational strengths. Such strong professional patterns also help to create regional or global regulatory regimes by diffusing norms and practices in their professional networks, or to provide also some regional or global public goods (Berg and Horrall, 2008; Djelic and Sahlin-Andersson, 2006). In current times, as a consequence, they constitute nodal institutions to articulate interactions between global and local actors, as well as between public and private ones, contributing to a better inter-connection of regional or global regulatory regimes to their domestic contexts.

Agencies are easily identifiable by global actors in the respective regulatory sector, because of its strong institutional identity, and configure contact points for global networks of specialized regulators in national domains. They contribute to transmit values, information and policy innovations–creating regulatory dialogues in transnational governance, beyond the national state. Also, they are often considered by local actors as contact points to access to global networks beyond the national dimension, and vice-versa, regulatory agencies are capable to adapt and disseminate at the domestic level emerging regulatory regimes, either of supranational or transnational nature, either of regional or global dimension. Thus, interests, preferences and perceptions on specific regulatory areas circulate fluently up and down in the multilevel governance arenas thanks to the role of the regulatory agency --in particular when they operate efficiently--, helping to configure a more integrated and active regional or global regulatory regime (i.e., for the European case, see Coen and Thatcher, 2008).

Multiple findings reflect that, to make possible the nodal role of regulatory agencies in the age of globalization, it is highly relevant the increasing importance of multiple transnational, sectoral and national networks established by professionals, regulocrats and epistemic communities, that are active in different international organizations, transnational structures and professional asso-ciations. These networks, operate across multiple dimensions, and contribute to the diffusion of regulatory innovations regional and worldwide. Also, once established, they are very relevant for the transmission of information on the implementation of regulatory instruments for policymaking at the national and sub-national levels (Jordana and Levi-Faur, 2012).

As an interesting example of these transnational regulatory networks emerging from bottom-up national regulators we find the case of REGULATEL, operating in Latin American telecommunications. REGULATEL was established in 1998 as a forum to facilitate cooperation among the newly established regulatory agencies in most Latin American countries. Its presidency rotates each year among the heads of the twenty regulatory agencies that form the network. There is also a steering committee drawn from a smaller number of agencies. REGULATEL has also established the figure of a General Secretary who assures administrative coordination among its members. The network has neither an inter-governmental nature, nor a supra-national one. It operates only as a coordinating body, sharing tasks and responsibilities among members and having a minimal organizational structure, to exchange experiences and promote common interests.

The main objectives of REGULATEL are to facilitate the exchange of information, to promote the harmonization of regulation in the region, contributing to regional integration, and to identifying regional interests as a whole, while seeking to define common positions to be defended in international forums. REGULATEL is the core regional telecommunications regulatory network, and is very active in organizing annual meetings of telecom regulators. In addition to their annual meeting and several other meetings, they convene an annual meeting together with AHCIET (telecom operators group) in which companies' professionals and regulators interact openly. To some extent, these periodic exchanges of information are seen as contributing to the harmonization of regulation in the region, and facilitating the emergence of learning mechanisms. Since 2001 REGULATEL has organized joint annual meetings with the European telecoms network (BEREC since 2009, IRG before) where national agency heads from both regions congregate, and they present and discuss best regulatory practices.

Regulatory agencies constitute nodal institutions to articulate interactions between global and local actors, as well as between public and private ones, contributing to a better inter-connection of regional or global regulatory regimes to their domestic contexts.
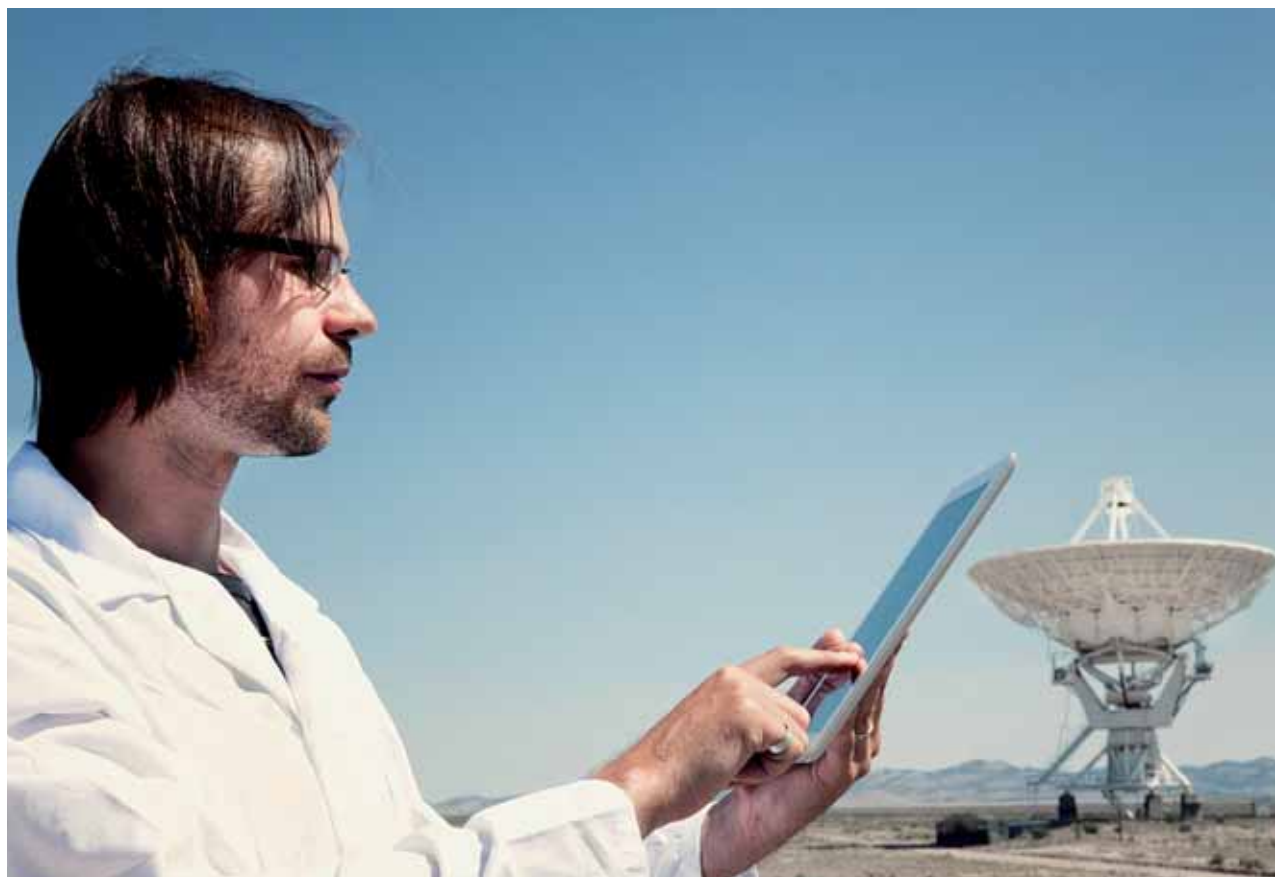
4.2
Knowledge networks in business
Ettore Bolisani and Enrico Scarso

Knowledge networks in business – concepts, evidence, lessons for management and policymaking

INTRODUCTION

This chapter deals with inter-organizational knowledge networks (Todeva, 2006) a concept that links organizations interacting for a specific and shared business goal and can include manufacturers, service companies, suppliers, customers, retailers, public agencies, universities, and even competitors. In these networks there is a subdivision of cognitive processes among members, whose success influences the success of the single company in the system.

Compared to related notions, the concept of Knowledge Networks (KNs) has some peculiarities. For example, the literature on supply chain management (Cooper, Ellram, 1993; Christopher, 2011) typically does not consider knowledge as a separate element; in addition, structures are generally linear (i.e., client-supplier connections), and the governance is mainly based on some application of hierarchical authority. Another important literature is that of industrial clusters (Karlsson et al., 2005), which however focuses on local relationships between companies, while the importance of extending connections to distant geographical areas – and all the implied problems – is underestimated. Finally, the newly introduced notion of "meta-organizations" seen as networks of firms or individuals not bound by authority but characterized by a system-level goal (Gulati et al., 2012) resembles that of KNs, but the latter differs from the former in relation to its explicit focus on knowledge management.

The notion of KNs poses new challenges for business management and policymaking. As regards management, companies join in KNs because they are not able to possess or develop all the knowledge needed to pursue their strategies. Hence, the participation in a KN and the management of relevant relationships imply the capability to implement Knowledge Management (KM) processes involving different organizations. In addition, while, in principle, knowledge exchanges are easier for companies sharing the same cognitive characteristics (i.e. operating in the same area, using similar procedures or codes, etc.), they are also more valuable when companies can learn from partners possessing different pieces of knowledge (i.e. there is a "knowledge distance" between partners). The capability to manage this contrast between cognitive proximity and distance becomes critical. Furthermore, the effective functioning of a KN involves an efficient subdivision of tasks and processes among the participants. Finally, an adequate technological infrastructure may be required, especially when a large amount of content has to be transmitted in a wide geographical area.

As regards policymaking, since knowledge production and diffusion are increasingly the outcome of collaborative relationships among various members (as affirmed by the "open innovation" paradigm - Chesbrough, 2003), KNs can be critical instruments for the transfer of best practices and innovations (Phelps et al., 2012). Hence, they become an important object of policymaking.

There is an increasing body of studies on KNs (Phelps et al., 2012), but the literature that explicitly considers knowledge processes that occur inside these networks as still scarce. The few studies that have addressed the issue of KN management from a knowledge management perspective have dealt mainly with two topics: one relates to the factors affecting the successful knowledge sharing among network members; and the other regards KN taxonomies. As to the first topic, various studies have discussed the factors that influence knowledge sharing in a KN (table 4.1). The assumption here is that facilitating internal knowledge sharing is the main goal of any KN. The second topic concerns the development of possible taxonomies of KNs. Various scholars have proposed different taxonomies based on distinct classification criteria (table 4.2). Even though the literature still lacks a common vision about the matter, these studies are an important starting point for developing an interpretative framework of the KN phenomenon. In addition, they help to clarify that there are different solutions and organizational settings for inter-organizational knowledge exchange, which calls for specific KM approaches, strategies, roles, and technologies. This confirms that managing KNs represents a complex issue that can not be seen just as the extension of practices applied within a single organization.

Table 4.1: Factors affecting knowledge sharing in networks

Source	Factors
Spring (2003)	○ nature of the exchanged knowledge ○ prior experience of participants ○ key staff mobility ○ information systems ○ presence of key mediators
Priestley (2006)	○ absorptive capacity ○ knowledge casual ambiguity ○ uncertainty of source-recipient relationships
Inkpen and Tsang (2005)	○ dimensions of social capital
He et al. (2006)	○ nature of inter-firm relationships ○ internal capacity ○ learning intentions ○ achieved memory ○ type of knowledge
Abraham and Leon (2006)	○ kind of manufactured products (functional vs. innovative)

Here we especially focus on KNs that: a) develop around an identifiable business project (e.g., the design, production and/or sale of a product/service; an R&D project; a joint marketing action, etc.); b) connect different types of organizations but basically for-profit firms (public agencies or non-profit organizations can be part of a KN with a supportive role); c) mix market relationships with other forms of interaction, in relation of the particular circumstances and goals; d) extend well beyond local areas, and can include companies in both developed and developing countries; e) can comprise multidimensional and nonlinear connections, and evolve dynamically; f) normally have a "leading" company; and g) are based on open but, basically, recurring or stable relationships.

Table 4.2: Different typologies of KNs

Source	Types of KN	Classification criteria
Mentzas et al. (2006)	○ closed and trading networks ○ closed and sharing networks ○ open and trading networks ○ open and sharing networks	○ locus of control ○ knowledge tradability
Möller and Svahn (2006)	○ current business networks ○ business renewal networks ○ emerging business networks	○ kind of learning processes
Grimaldi and Cricelli (2007)	○ supply networks ○ business networks ○ industrial districts ○ research networks ○ learning networks	○ degree of coordination ○ mission
Valkokari et al. (2912)	○ transaction networks ○ co-creation networks	○ nature of knowledge

EMPIRICAL EVIDENCE

This section briefly reports on an empirical investigation into factors and elements that influence the way firms exchange knowledge in KNs and, through such exchanges, into the way they pursue their strategic goals. An exploratory multiple case-study analysis of KNs in four industries was conducted. KNs were partially reconstructed by starting from a company (an OEM – Original Equipment Manufacturer) and then by identifying other "nodes" having significant and regular interactions with that company (i.e., suppliers, service providers, research labs, etc.). In turn, other connected nodes were identified based on a "snowball" approach. In accordance with the definition indicated in the previous sections, KNs were identified based on a "business project" on which companies collaborate. The second step of the analysis consisted in identifying and modelling knowledge exchanges occurring between the investigated companies during the implementation of that business project. Based on the existing literature, the variables and elements analyzed were particularly the following: a) structural aspects (size of the KN, roles of nodes, value chains and their

interconnection, kind and intensity of relationships); b) knowledge-related aspects (nature of knowledge exchanged, KM processes involved, absorptive capability and learning processes); c) managerial aspects (business strategies; KM approaches and their link with other managerial aspects; information systems). By collecting information about these aspects, it was possible to investigate the nature of inter-company knowledge exchanges, the mechanisms employed for these, and the involvement of each node in the network. The analysis allowed for the discovery of regularities and recurring issues in the cases analyzed. It was then possible to analyze how these knowledge exchanges contributed to the business of each company and of the whole network, and to derive implications for business management and policymaking. An outline of the study is illustrated in table 4.3; further details (based on preliminary findings) are provided in Gottardi, 2009.

Table 4.3: Main characteristics of the examined KNs

Industry	Name of leading company - OEM	Structural key issues	Knowledge-based key issues	Internal management key issues
Agricultural-construction equipment	CNH - Case New Holland	OEM and supply chain developed around the project of a new vehicle; overlapping networks	Standardization of technical/operations data; efficient knowledge flows	For OEM: capability to govern the supply chain. For suppliers: meeting technical/operational requirements of partners
Software (ERP)	SAP	OEM and dealers; overlapping network	Combining knowledge of local markets with standard knowledge of the core product (i.e. SAP ERP)	For OEM: balancing knowledge protection and disclosure. For dealers: balancing needs of markets with those of OEM
W	DIOR SINV	OEMs with suppliers and dealers; interconnected networks	Combining tacit knowledge of fashion trends with technical knowledge of operations	For OEM: selecting appropriate partners for specific tasks. For suppliers and service providers: interpreting knowledge of product autonomously
Footwear	GEOX	OEM and sellers; partially closed network	Efficient flows of knowledge from/to the final market and their interpretation	For OEM: exploiting information on markets. For sellers: contributing to the brand's market success

OPEN ISSUES AND LESSON LEARNED FOR KN MANAGEMENT

Common language and interpretative context. KNs participants provide specialized competencies that are necessary for the practical development of the common business idea. To communicate effectively, participants must share a basic "pool of knowledge" about products, technologies, operational problems, markets, etc. For this goal, a set of technical languages, codes, and interpretative frameworks are developed: they represent a point in common among participants, and tend to be specific for each KN. A lesson for KN management is that companies that are willing to participate in a KN must be able to develop and acquire these basic elements of knowledge and language, which allow them to interact and collaborate with the other participants.

Knowledge protection and trust. KN boundaries can change dynamically: companies often participate in more than one network simultaneously at the same time, or can enter/exit the network depending on the particular variation of the project. This affects the management of knowledge flowing in a KN: on the one hand, cooperating on a common project requires that companies share precious elements of knowledge with partners; on the other hand, knowledge transferred to others may be appropriated and employed against the will of the original producer. Consequently, there is the need to find a proper balance between knowledge protection and disclosure. Pure market relationships (even if protected by patents) may be inappropriate, because of the uncertainty and risk that may characterise this kind of interaction. The capability to build an appropriate, trustworthy environment becomes an essential managerial skill for governing or joining in a KN.

Partner selection. How to find appropriate partners or select what KN to join in is another important issue of KN management, and can be a costly activity that requires special competencies in partner research, selection, and monitoring, and can also imply investments in procedures and software tools. Building a new fruitful relationship may require to manage a process of mutual "acquaintance" that proceeds through trials and errors: companies must be able to capitalize their experience with other companies even if the partnership doesn't succeed. Subdivision of (cognitive) tasks. A KN implies a subdivision of tasks that require different knowledge to be processed. This raises an essential question: who decides what company must be assigned to a particular task in a business project? There is a difference in the roles played by network participants. If there is a "leading company" (as the OEMs examined in our study), it can, to some extent, assign tasks. This process requires, however, a knowledge of the entire network, and a capability to plan and manage the overall business project. Evidence showed that, in leading companies, the management of external relationships (of suppliers, services, labs, etc.) is an increasingly important skill for executives. The capability to assign tasks to business partners can be replicated by other participants (for example, in a chain of suppliers).

Project management and knowledge management. A possible way to distribute tasks in a KN is to adopt a project management approach by reconstructing the cycle of a business project, and breaking it down into parts that are suitable for the competencies of each network participant. In addition, the necessary knowledge exchanges that partners need to perform should be identified. Each company must be able to fit the internal processes of knowledge management to the rest of the KN: for example, by adopting practices that facilitate the exchange of useful documents, technical data, etc. efficiently and effectively. Also, for companies involved in KN interactions, it may be important to formulate a proper strategy of knowledge capitalization, i.e., how to capitalise and reuse the experience made with partners, and how to activate internal learning processes quickly.

Signalling competencies. To facilitate the functioning of the network, a company must be able to signal to the others its competence and know-how and must select the knowledge base to invest in for being attractive to the network partners. Consequently, pure market relationships may be insufficient, especially in the case of complex business projects that require special technical or organizational competencies: mutual learning, intense relationships and a trustworthy climate may be of help, but these elements must be cultivated and managed properly.

ICT systems. The role of ICT systems is essential in KNs that extend beyond the local clusters. This raises a well known problem in the KM literature: how can ICT systems support effective knowledge exchanges? The implications range from the identification of the kind of knowledge to be exchanged (i.e., tacit vs. explicit) to the issue of appropriate coding-decoding. The more the exchanged knowledge is explicit (e.g., technical data in coded formats), the easier it is to use ICT systems to store and deliver it. However, not only explicit knowledge is exchanged, but also tacit knowledge (i.e., special know-how, experience, perceptions, etc.). This generally requires mutual interactions and long-lasting relationships, and can't be performed by highly structured ICT systems. The new web 2.0 applications are extending the frontiers of application and facilitate social interactions and, by doing so, they are deemed to facilitate tacit knowledge exchange. New managerial skills are needed to design and use these systems though.

KNs' governance. In the cases examined, a leading company has a key role in establishing the "rules of functioning" of the KN, i.e.: main goals, processes, expected performances, languages used, etc. However, this role cannot be simply played in terms of hierarchical governance. Even the leading company, which generally has direct knowledge of the final market and formulates the overall "business concept", is unable to control all the variables and elements that are necessary for governing a network in a strictly hierarchical way. In addition, KNs must therefore keep some flexibility and a capability to adapt to changes in the environment. A proper mix between informality and hierarchical governance becomes vital.

Measurement. In the managerial literature, performance measurement is often restricted to the single organization – with some exceptions such as methods to measure suppliers' performances or customers' value. Innovative techniques to measure the performance of a KN should be therefore introduced. Particularly important is the association of the performances of the single company to those of the entire network. This is critical because KNs develop around the intangible assets represented by the "collective" knowledge that is exploited. Performance indicators of KNs should include methods to measure knowledge and intangible capital, which is still a debated challenge.

IMPLICATIONS FOR POLICYMAKING

The aspects depicted above are important not only as "prerequisites" of appropriate managerial skills of a new generation of company executives in an interconnected world, but also for policymaking. In particular, KNs can be a way for small or local companies, both in developed and developing countries, to be included into "the big businesses" and, by doing so, to exploit opportunities that would be hard to achieve on a local scale. Therefore, enhancing knowledge networking can be important for boosting sustainable development.

Managerial education. Since KNs require new managerial skills, a goal of policymaking can be to facilitate the identification of these skills and support educational institutions in designing and organizing high-level training courses for senior executives and young professionals. A special attention to multidimensional knowledge management skills (i.e. integrating economics, organizational skills, ICT management, intellectual capital management, etc.) may be necessary, which would require a transformation of traditional university courses. The weaker areas of the world can draw particular benefits from a connection with developed countries – which may result in the necessity of programmes to reinforce connections between universities of "North and South".

Investing in "knowledge-based infrastructures". A fruitful inclusion in KNs requires investments in developing knowledge that fits the partners, in acquiring the managerial "languages" and the technical codes for interacting on a global scale, in selecting partners and establishing long-term relationships, in signalling competencies to potential partners, etc. Especially in the weaker regions, public agencies and institutional intermediaries can help to fill this "knowledge gap" of local companies. Another important element is the availability of advanced communication systems at a reasonable cost. However, it must be recalled that not all ICT applications fit every kind of knowledge exchange, so there is the need to select appropriate projects for each specific case.

Focus of industrial policies. Putting an emphasis on KNs implies that the scope of industrial policies cannot be restricted to "local" companies but may affect networked partners located in other regions or even countries. Direct financial support to local territories may be insufficient if companies compete in global markets and interact with distant companies. Also, it may be more effective to support the "business project" that underlies a network rather than "networking" as a sort of general ability. For policymakers, this means having the capability to assess and select promising business projects that can really boost development and economic growth.

Intellectual property. Especially in developed countries, a reaction to the uncertainty of the current economic climate is often to raise protection barriers for "locally produced" intellectual capital, and to build firewalls that avoid leakages and imitations. While intellectual property rights (IPR) protection can, in the short run, favour local competencies, in the long run interactions and knowledge exchanges can be hindered, and learning processes can be difficult. In a connected world, companies must learn how to exchange knowledge and, by doing so, learn new things rather than simply protecting the knowledge developed in the past. Finding a proper trade-off between restrictive IPR legislations and supports to knowledge sharing is a real challenge for today's policymakers at all levels.

IMPLICATIONS FOR RESEARCH

KNs can be an increasingly important topic for future research. They can be a direct source of analysis, and their study can provide fresh notions in terms of business management and policymaking. The piece of research mentioned here confirms that it is possible to identify cases of independent companies, collaborating to a specific business project, that establish dynamic but stable networks whose fundamental glue is the capability to exchange knowledge. This enables different specializations and, at the same time, a connection of complementary competencies. Therefore, it is really possible to talk about the existence of KNs as it was previously defined.

The potential limitations of the empirical investigation presented here can also provide food for thought for a future research agenda. A first issue regards KN identification. In this study, the basic assumption was that KNs develop in direct relationship with a business project. This eases the analysis, but can also reduce the range of KNs that are considered. A second issue is KN reconstruction. In our study, we started from a leading company and, from this point, we identified the connected partners. However, since today's companies have a broad range of relations with trading partners, it is important to reflect on the criterion used to decide when a company is part of a KN. The validity of this criterion can influence the significance of the analysis.

A lesson for KN management is that companies that are willing to participate in a KN must be able to develop and acquire these basic elements of knowledge and language, which allow them to interact and collaborate with the other participants.

4.3
Barriers to building learning networks

Ana Aleksić Mirić

INTRODUCTION

In today's complex and highly competitive business environment, where business success and private sector development are achieved through improving knowledge and proactive behaviour, organizational learning and transfer of knowledge are among the most important driving forces for inter-organizational linking (Inkpen, Ramaswamy, 2006; Child, 2001; Lyles, 2001). Organizations initiate, create and function within network structures, with different goals, actors and outcomes. More often than not, organizations simultaneously function through several different inter-organizational networks: equity or non-equity based alliances, supplier-buyer partnerships, outsourcing agreements, technical collaboration, joint research projects, shared new product development, shared manufacturing arrangements, common distribution arrangements, cross-selling arrangements and so forth. Therefore, organizations themselves are a set of formal and informal inter-organizational ties and linkages created among members of organizations on different criteria.

Increasing interest in the organization of networks came with the sense that knowledge is the key resource, but at the same time, is a stock category that needs to be carefully managed through constant enrichment with new knowledge gained through continuous learning. An organization's learning ability is the true source of competitive success and a way to keep and improve one's market position.

Contemporary organization theory makes a clear distinction between the concepts of organizational learning and organizational knowledge. Organizational knowledge is the result of a learning process, as well as the basis of further learning: knowledge is "information that corresponds to a particular context" (Burton et al, 2011). Knowledge is "what we know, learning is adding to and changing what we know'' (Burton, Obel, 2004: 11). Since the beginning of the millennium management literature has changed its focus from knowledge transfer to knowledge management. Understood as conscious coordination and monitoring of knowledge processes, knowledge management becomes an organizational design issue to improve the efficiency and effectiveness of an organization and its people by sharing knowledge and information (Burton, Obel, 2004: 10). Argote and Ingram (2000) argue that the ability of organizations to transfer knowledge becomes increasingly important as organizations which are able to undertake this process effectively reach higher productivity levels and have higher chances to survive in comparison to those less capable of effective knowledge transfer. Still, our knowledge about inter-organizational learning is more fragmented and less systematized than that about intra-organizational learning. This chapter addresses barriers to the creation of learning networks.

Though every network is a knowledge network in terms of knowledge deposited within actors, not every knowledge network is a learning network.

NETWORKS, KNOWLEDGE AND LEARNING

Knowledge networks exist even when we are not aware of them. In fact, every single or multi-unit organization can be represented in a form of knowledge network. People, as members of organizations, possess certain knowledge gained through their education, life and work experience. This knowledge can be more or less relevant to the concrete organizational or inter-organizational context. Tasks to which people are assigned also represent a specific source of knowledge, as do the tools organizations use to connect people and tasks with one another. This same logic works on inter-organizational level, when companies create multi-organizations through mergers, alliances, joint ventures or other types of networks. Though every network is a knowledge network in terms of knowledge deposited within actors, not every knowledge network is a learning network. Learning networks represent a set of mutually connected knowledge actors, with a capacity of a network to gain insight from its own experience and to modify the way it functions according to such insight, which leads to the development of the knowledge base of the actors and the network as a whole (adapted from Shaw and Perkins 1991; Shrivastava 1981, definitions of organizational learning).

BARRIERS TO KNOWLEDGE CREATION AND LEARNING IN NETWORKS

How learning processes can be blocked from an inadequate interaction between an individual and an organization was explained by March and Olsen (1975). They argue that learning processes can be interrupted because (1) individuals are constrained by their organizational roles, which frame their ways of behaviour, restricting them from acting in accordance with their beliefs; (2) individuals that changed their behaviour as a consequence of learning on an individual level, have limited abilities to influence other members of the organization to change behaviour as well, and accordingly, to effect change organizational behavioural routines; the third and the fourth learning barriers come from inadequate interpretations of the environment and its connections with the organization. The existing knowledge also indicates that organizational learning processes can be interrupted by (1) organizational structure (for example, learning happens fragmentally, within one part of the organization, while not happening in the other), (2) leadership and (3) organizational climate and culture (Schein, 1996). The knowledge-based view of the firm also reports that pre-existing knowledge and established learning patterns are relevant barriers to organizational learning. The introduction of new knowledge and learning strategies are profoundly dependent on the speed at which organization can unlearn, and discard obsolete knowledge and established outmoded learning patterns, which no longer correspond with reality as the situation changes. Berthoin Antal et al (2003) systematize barriers to organizational learning into the following three groups: (1) barriers related to interrupted learning processes, (2) psychological and cultural types of barriers, and (3) barriers related to organizational structure and leadership.

Knowledge in learning barriers is further enriched with the insights from multi-unit organizations' research in strategic alliances, joint ventures and mergers. Child (2003: 669) argues that internal differentiation within and external differentiation between organizations introduces barriers to organizational learning within alliances, identifying social identities, typically represented by different organizational and national cultures. Lane and Lubatkin (1998) offer further insights into the influence of organizational structure and learning by testing the hypothesis that similarity in organizational structures between the learning and the teaching partner is positively connected to inter-organizational learning. This was achieved by measuring each firm's structure in terms of formalization (divided into upper and lower management formalization) and centralization of decision-making (divided into business decisions and research decisions). Lane and Lubatkin report on a positive association between the similarity of lower management formalization and the similarity of research centralization with inter-organizational learning, and negative association of the similarity of upper management formalization and the similarity of business decisions centralization.

Systematizing existing knowledge on barriers to learning and knowledge creation in networks, we can identify their traits on the (1) actor level and on the (2) ties (or connections) level. If an actor is an organization, actor-level barriers can come from (1) strategy, (2) leadership, and (3) culture and climate; ties level barriers are defined by organizational design (architecture) properties. Organizational design in networks encompasses two levels: the intra-organizational design of individual organizations constituting the network (actors) and the inter-organizational design of a network itself. Recent research on organizational design (Gulati et al, 2012; Fjeldstad et al, 2012; Puranam, Goetting, 2012) defines meta-organization as ''networks of firms or individuals not bounded by authority based on employment relations, but characterized by a system-level goal''. While intra-organizational design is driven by the traditional principles of formal authority, control, hierarchy, organizational roles and centralization/decentralization, inter-organizational design concerns the design of channels of communication between actors.

Figure 4.1: Barriers to learning in networks

"Hard" Network Properties   "Soft" Network Properties
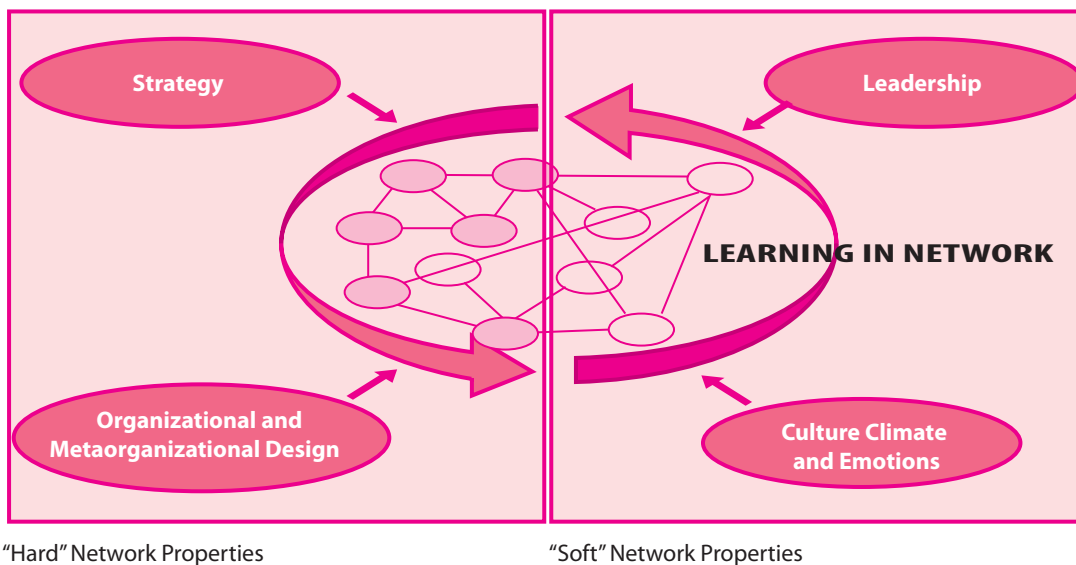
BARRIER 1: STRATEGY

Strategy determines products and services to be produced, markets to be served and values to be provided to the customers. Also, strategy defines sources of organization's competitive success. In organizational design literature, strategy is traditionally considered to be the first element in the design process to be decided upon, establishing criteria for determining further design decisions (Chandler, 1962; Galbraith et al, 2002). In terms of networks, strategy formulation explains the value the organization wants to generate through network creation.

Fluency of the learning process in the network is influenced by the achieved level of strategic fit between network members. Strategic fit refers to strategic complementarities between partners: does the combination of the skills and resources allow the alliance entity to perform a task that could not be performed that well by the partners acting alone (Inkpen, Ramaswamy, 2006: 95). Collaborative learning in networks can occur in the form of (1) mutual learning between two equal partners and (2) learning between the partners who are not at the same level of knowledge so that the relation can be best described as the one between a teacher and a student. Mutual learning between two equal partners occurs in situations when each of the partners has something to learn from engaging into the network, and when they recognize potentials to improve knowledge depositories and learning capabilities through the network. Network members recognize a network as a platform to improve their ways of doing business in terms of learning and teaching. That kind of relationship on a dyadic level can be termed as "learner-learner" relationship. To produce adequate learning potentials within the network, learner-learner relationships should be supported by the use of "soft" (behavioural, informal) methods of coordination, suitable for inter-organizational learning without standing as a barrier for direct knowledge transfer. On the contrary, soft methods of coordination enhance the transfer of tacit knowledge. When partners are not completely equal, but one takes the role of a learner and the other the role of a teacher (Hamel, 1991), the "teacher-learner" type of the relationship occurs. Teacher-Learner relationships are adequate for the purpose of direct knowledge transfer from one partner to the other, and should be followed by the use of "hard" (institutional, formal) methods of coordination.

Box 4.1: A Serbian-German partnership

REFLECTION FROM CONNECTED RESEARCH

A partnership was created between the oldest Serbian media company and a European media giant originating in Germany. In the process of forming (creating) the partnership, both sides used their organizational knowledge as a strong instrument for negotiation in order to estimate the relative values of their roles. Both the Serbian partner and the German partner claimed the investment of 24 million Euros each in the name of organizational knowledge they would bring into the partnership. In that way, organizational knowledge was basically recognized as the most valuable investment within the investment structure by both partners. However, the contract between the partners neither defined precisely what that investment involves, nor was there an action plan to specify what the knowledge transfer covers. Organizational learning through the new business venture was not explicitly recognized as an incentive of creating the partnership, at least not at this stage of its development (Aleksić Mirić, Burton, 2012).

Strategic fit also deals with the question of whether partners see the aim and the intentions of the partnership in the same way, and whether they recognize the same objectives as the goals of partnership creation. Studying strategic alliances, Child (2003) argues that there are basically two means to recognize strategic orientation towards learning within a strategic alliance: (1) learning can be formally recognized as the goal of alliance creation and formulated in the mission statement, which is a more explicit and straightforward means, and (2) learning can be recognized as important because partners show the intention to learn and acquire knowledge from one another without doubts. Some networks recognize the importance of learning and emphasize it in such a way as to include it clearly and unambiguously in a strategy statement. Others use a less transparent manner and do not include learning in the formulation of the strategy, but the underlying pattern of strategic decisions made regarding network functioning is the thing that undoubtedly reflects strategic orientation towards learning. Finally, the deepest level of acceptance of learning as a strategic objective occurs when the people involved in the network recognize learning as their own, inner value. Very often organizations that enter a network fail to recognize learning effects through an increased knowledge base due to limited performance management. If an organization applies a more complex method of performance management it will be more able to understand the achieved and the needed improvements in the knowledge base and to intervene through adequate learning actions.

ACTIONS TO BE TAKEN:

- Clearly define the knowledge each network member brings into the network.

- Make network members clearly define expectations or goals to achieve in knowledge/learning sense.

- Define learning strategies or knowledge exchange protocols.

- Identify key actors in the network within the knowledge-learning frame.

- Define "teacher – learner" / "learner-learner" ties among network members.

Why is leadership so important for organizational and inter-organizational learning? Because leaders assume responsibility in the organization for defining a strategy and designing the organization in such a way as to implement that strategy.

BARRIER 2: LEADERSHIP

In the context of the creation of learning networks, strategy formulation and interpretation through leadership are closely connected. Most of all, strategic orientation towards knowledge as an important organizational resource and strategic activities towards the creation of learning networks within an organization depend significantly on the behaviour of leader and leadership orientation. Discussing barriers to organizational learning, Berthoin Antal et al (2003: 882) suggest that the foremost importance for ensuring learning in organizations is to be sure that an organization has adequate quality and quantity of leaders. Why is leadership so important for organizational and inter-organizational learning? Because leaders assume responsibility in the organization for defining a strategy and designing the organization in such a way as to implement that strategy. They interpret strategic goals to members of the organization, and are responsible for removing organizational barriers that prevent plans from becoming reality. In terms of networks, leadership occurs not only on an organizational but on a network (meta-organizational) level as well. Therefore, the strategic apex of the organization and the strategic apex of the network should simultaneously develop an inter- and intra- organizational network perspective, so as to strategically think about knowledge use and knowledge development. They should constantly consider answering the question "do we use all our available knowledge resources" and "what should we do in order to keep knowledge repositories fit and competitive?"

Leadership orientation towards the creation of a learning network should be operationalized through policies and practices of human resource management. The strategic management of human resources should be aware of the organization's knowledge resources, should recognize knowledge stocks and should strategically manage people in order to enable learning uninterruptedly. However, in most organizations, HR practices are not designed in accordance with knowledge / learning networks logics. HR evidence about employees should be designed as to enable identification of human potentials at the moment, as well as their dynamic capabilities and potentials for further development through learning. HR managers should be trained to think from the network perspective, no matter what the formal architecture of an organization is. This network view should be supported by the strategic apex as well in order to be effective.

ACTIONS TO BE TAKEN:

○ Think strategically about knowledge use and knowledge development through an inter and intra organizational network.

○ Keep evaluating if all available knowledge resources are used.

○ Keep considering what should be done in order to keep knowledge repositories fit and competitive

○ Design Human Resource practices in accordance to knowledge / learning networks logics

Box 4.2: Organizational leadership

REFLECTION FROM CONNECTED RESEARCH: LEADERSHIP IN INDUSTRIAL CLUSTERS

A very common situation in inter-organizational networks is that one partner (no matter how many partners there are) is dominant over others and takes a central position within a network. In case of industrial clusters, this central position can be held either by the dominant company in the cluster, or by the position of a cluster manager. A cluster manager is the architect of structural and social ties within the cluster. The cluster manager should be the leader of the meta-organization created through the cluster. Though usually without formal authority over individual constituent organizations, the cluster manager should build a significant informal authority based on knowledge, experience and gatekeeping privileges (Gulati et al, 2012:573). The cluster manager should experience both formal authority to represent the cluster, with an aim to maximize productivity of existing knowledge capabilities of cluster members through the search for business challenges that would be beneficial for cluster members, and the cluster as an entity. The cluster manager should also hold the informal authority by means of which he would influence decisions of the individual constituent organizations so as to align them with cluster's interests (Petković, Aleksić Mirić, Petrović, 2012).

BARRIER 3: ORGANIZATIONAL DESIGN

The design of an organization defines its ability both to accept and to give knowledge: giving and receiving knowledge requires a range of mechanisms through which knowledge is transferred, while the design of an organization defines the paths and routes of this transfer. Existing knowledge on the influence of organizational design on organizational learning and knowledge transfer in networks led to an evaluation of the importance of similarity. The key question was if similarity of organizational structures of network members positively affected knowledge creation processes and learning in a network (Lane, Lubatkin, 1998).

Designing a learning network is not about the similarity between network members, but about their compatibility or fit. Similarity in formal organizational configurations among network members might be a preferred characteristic if the network goal is direct knowledge transfer. Similarity in formal organizational configurations among network partners might be preferred characteristic if the relationship between the actors within the network is built on a "teacher-learner" basis. Similarity of the internal organizational characteristics of the receiver (learner) with the organizational configuration of a provider (teacher) can help knowledge being transferred more successfully, as the probability of misfits in the design decreases. Similarity in the organizational configuration and coordination between actors within a network supports single-loop learning.

Similarity in formal organizational configurations of partners within the network is neither a prerequisite, nor is it a preferred organizational characteristic for inter-organizational learning in networks. Organizational learning and knowledge transfer can be achieved even when configurations of formal organizations of the partners are completely different, provided that through network evolution partners create compatible structures and design information-flow channels to enable knowledge transfer and organizational learning (design fit). Series of evidence on how to measure design fit can be found in Burton, Obel, 2004.

Organizations manifest inflexibility towards propensity to change formal organizational design as they enter a certain network. Therefore the potential polygon for interventions should not be restricted only to the formal organizational configuration, but should encompass an informal organization behind the chart as well. In their paper on absorptive capacity, Volberda et al (2010) suggest that research on absorptive capacity should draw on social network research to clarify how channels of communication implied by network units impact absorptive capacity. Further, they argue that absorptive capacity requires porous boundaries, scanning broadly for new knowledge and identifying and using those employees ''who serve as gatekeepers and boundary spanners.'' Therefore, together with investigating potential barriers to learning that are generated from an organizational structure as formal organization, characteristics of informal organization should be evaluated as well. The formal organizational structure should be compared with the organizational social network scheme formed by asking questions (1) to whom do you go to for professional advice within the organization and (2) with whom do you communicate the most. That would enable the identification of actors with knowledge repositories for a certain task in the organization, and the identification of information channels that are present at the very moment.

ACTIONS TO BE TAKEN:

○ Networks should be designed for learning both on meta-organizational design level, and on the level of organizational design of individual constituent organizations.

○ As formal organizational design manifests rigidness to changes due to entering a network, mechanisms of informal organizational design should also be used.

○ Design of communication channels is the most important aspect of organizational and network design.

○ Consider both the interventions in the formal and the informal organizational configuration.

IMPORTANT TO CONSIDER:

It must be kept in mind that networks are dynamic systems per se and evolve over time. The question is what happens if learning and knowledge transfer do not occur simultaneously in all parts of the network, so that some parts experience intensive knowledge transfer / learning within the network, while others remain completely uninfluenced?

As a network evolves over time, learning asymmetry within the same entity will create discrepancies in the knowledge base, which will lead to organizational misfits that will inhibit the network to develop continuously and will hamper the creation of strong learning capabilities. These misfits are unsustainable if the product is a joint one, and depends on the inputs from all parts.

Box 4.3 – Learning asymmetry within the network

BARRIER 4: CULTURE, CLIMATE AND EMOTIONS

The case of an alliance between a Serbian and German partner, as we exemplified with regard to strategy earlier, is illustrative in terms of cultural barriers as well. Partners in this case shared similar cultural values: reputable corporate history, strong corporate pride and reliance on strict professional standards. Both partners highly valued their own previous achievements, reputation, and identity, and they built obstacles for organizational learning into the alliance. Both of them were positioned as teachers, with an intention to dominate over the other in certain areas. The teacher-teacher relationship paralyzed this network from learning, and neutralized its absorptive capacity preventing partners from realizing all potential aspects of collaboration and potential way to build joint competency.

ACTIONS TO BE TAKEN:

○ Observe emotions of employees and the climate within the organization towards the network. Consider the influence they can have on learning in the network carefully. If people are not satisfied, feel fear or discomfort towards the network, learning will be inhibited. Remember, networks should serve as a supportive environment for free knowledge distribution and learning. This cannot happen if the people involved in networks do not feel free and motivated to give and gain knowledge.

○ Reconsider values of corporate culture from the point of learning. It is not the strength of an organizational culture that influences learning processes in networks, but its openness towards learning.

Learning networks represent a set of mutually connected knowledge actors, with the capacity of a network to gain insight from its own experience and to modify the way it functions according to such insight. This leads to the development of the knowledge base.

CONCLUSIONS

Despite the driving need of the practice for building successful learning strategies and techniques of knowledge increase in networks, research on organizational learning and knowledge transfer in networks report that they do not result in the flow of knowledge and learning to the expected extent, even when formed with the aim to be incubators of new knowledge and a device for the dissemination of the existing knowledge (Muthusamy, White, 2006; Grant, Baden-Fuller, 2004; Inkpen, 1998; Mowery et al., 1996). Some findings even suggest that lack of knowledge transfer and learning seems to be a rule rather than an exception. We argue that knowledge networks and learning networks are not the same and that not every knowledge network will eventually be a learning network as well. Though every network is a knowledge network in terms of knowledge deposited within actors, not every knowledge network is a learning network. Learning networks represent a set of mutually connected knowledge actors, with the capacity of a network to gain insight from its own experience and to modify the way it functions according to such insight, which leads to the development of the knowledge base of the actors and the network as a whole. The ability of an organization to learn through networks, as well as the ability of networks to become learning environments depends on the ability of the organizational and the network architects to recognize potential learning barriers and to intervene towards their removal (table 4.4). Networks should be designed to learn through (1) a careful consideration of learning intentions and strategies applied by network members, (2) a design of formal and informal communication as to enable a knowledge flow, (3) strategic management of human resources through adequate leadership on organizational and network level, and (4) the creation of an emotionally supportive environment with strong commitment to free information exchange and learning.

Learning networks represent a set of mutually connected knowledge actors.

Barrier	Manifestation (How to Recognize It)	Potential Interventions (How to Overcome It)
Strategic Intentions	○ Unclear and not precise definition of the knowledge resources of partners within the network. ○ Vague or undefined expectations towards improvements in knowledge due to involvement in the network. ○ Undefined learning strategies and action plans.	○ Define knowledge you are bringing into the network. ○ Define expectations or goals to achieve in knowledge / learning sense. ○ Define learning strategies or knowledge exchange protocols. ○ Identify key actors. ○ Define your position in Teacher – Learner frame ○ Improve performance management systems
Leadership	○ There is no strategic apex of the network, or it is inadequately developed. ○ Strategic apex of the organization does not think in network framework about managing people. ○ Questions like "do we use all our available knowledge resources" and "what should we do in order to keep knowledge repositories fit and competitive?" are not asked.	○ Think strategically about knowledge use and knowledge development through inter and intra organizational network. ○ Keep evaluating if all available knowledge resources are used. ○ Keep considering what should be done in order to keep knowledge repositories fit and competitive ○ Design HR practices in accordance with knowledge / learning networks logics.
Organizational Design	○ Poor level of cooperation between network members. ○ Poor communication within the network. ○ Low network performances. ○ No positive change in organization performances after entering the network.	○ Networks should be designed for learning both on meta-organizational design level, and on the level of organizational design of individual constituent organizations. ○ As formal organizational design manifest rigidity to changes due to entering a network, mechanisms of informal organizational design should also be used. ○ Design of communication channels is the most important aspect of organizational and network organizational design. ○ Consider both the interventions in formal and informal organizational configuration.
Culture, Climate and Emotions	○ Poor level of cooperation between network members. ○ Low level of trust within the network ○ "We-they" relationships	○ Observe emotions of employees and climate within organization towards network. Consider carefully the influence they can have on learning in network. ○ Eliminate fear, discomfort and sources or dissatisfaction. Remember, networks should serve as support environment for free knowledge distribution and learning. This cannot happen if people involved in networks do not feel free and motivated to give and gain knowledge. ○ Reconsider values of corporate culture from the point of learning. It is not the strength of organizational culture, but its openness towards learning that influences learning processes in networks.

Table 4.4: Barriers to building learning networks: Manifestations and potential interventions

4.4 Independence and hierarchy

Timothy Meyer

Independence and hierarchy in international scientific cooperation

INTRODUCTION

Scientific uncertainty is a pervasive problem in international law and policy. Scientific and technical knowledge is increasingly critical in areas ranging from climate change, air pollution, and trade in goods as different as endangered species and toxic chemicals, and in different kinds of international institutions, including bargaining institutions such as the Conference of the Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and international tribunals overseeing trade and investment issues (See, e.g., Alvarez 2012). The prevalence of scientific uncertainty and the importance of scientific and technical research to international cooperation creates pressure for what I refer to as epistemic cooperation– efforts by states to produce scientific knowledge that facilitates the harmonization of policies and economic activity by states and non-state actors. Yet epistemic cooperation by states is an inherently fraught exercise. Science and policy are fundamentally distinct areas of human activity (Underdal 2000). How then should states organize epistemic cooperation? Traditionally, states have created broad multilateral institutions, such as the UNFCCC or the World Trade Organization (WTO) to facilitate cooperation on substantive issues. Should epistemic institutions – institutions engaged in producing scientific and technical information about specific legal and policy problems – be subordinate to or independent of these legal institutions – institutions charged with making and enforcing cooperative policies?

I argue that the answer depends on whether the scientific information produced by an epistemic institution alters the incentives of states and non-state actors to change their behaviour unilaterally. When a cooperative problem requires collective action, scientific information alone is unlikely to change the incentives for individual action. Control of epistemic institutions by legal institutions can increase the chances of harmonization through collective decision-making the only realistic option for cooperation – by allowing all parties participating in the legal institution to oversee the production of the scientific record ex ante, thereby boosting the credibility of the scientific record. Where collective action is not required, however, the independence of epistemic institutions facilitates the dissemination of scientific information to a wide range of actors. Individual experimentation in these situations can verify ex post the credibility of the scientific record, and networks of policymakers and international institutions can facilitate the diffusion of scientific knowledge and policies. Fragmented and networked knowledge governance is thus likely to be optimal for areas involving technology transfer or international problems with largely local effects, such as health and food safety measures. On the other hand, hierarchical and centralized knowledge governance is likely to be optimal for the management of common pool resources such as fisheries.

EPISTEMIC COOPERATION

States create international institutions to solve a wide range of cooperative problems, ranging from climate change to barriers to free trade to arms races. International institutions perform many roles. One of the most important is as fora in which cooperative policies are bargained over and legal rules agreed by negotiators or created by international judges (I refer to negotiators, policymakers, and judges collectively as "decision makers") (Keohane 1984; Alvarez 2005). States that wish to create legal rules to harmonize their policies on a particular issue, such as climate change or the compatibility of health and safety measures with free trade obligations, often face a preliminary problem of epistemic cooperation – the need to reduce the level of scientific uncertainty associated with a particular problem. Decision makers may be uncertain, for example, about the health consequences of smoking, the economic consequences of a carbon tax, or the environmental consequences of failing to reduce carbon emissions. Decision makers are thus often not in a position to make policy until greater scientific certainty has been achieved. Indeed, decision-making is often aided by having an agreed scientific record that can be the basis for bargaining over cooperative policies and legal rules. Epistemic cooperation – the process of trying to reduce scientific uncertainty by producing a shared body of scientific knowledge – does not ensure successful cooperation on the harmonization of policies. States still have interests that affect their bargaining positions. But epistemic cooperation can facilitate the creation of desirable legal rules by helping states understand how best to pursue their interests and identify common ground.

Epistemic cooperation addresses two basic problems. First, raw scientific research is of little direct use to decision makers in part because it may never reach decision makers and in part because it may not be in a form that is relevant or easily understood by non-experts (Underdal 2000). Thus, before legal and policy decisions can be made on the basis of scientific knowledge, that knowledge has to undergo a process through which it becomes "usable" to decision makers (Haas & Stevens 2011), meaning that it is in a form that is both relevant to a particular legal or policy problem and accessible to decision makers.

Second, because they are non-experts, decision makers are usually unable to directly assess the credibility of the scientific information that comes before them. This credibility issue is compounded in international negotiations because scientific information tends to be concentrated in developed states and among economic interests that are vested in particular outcomes. Epistemic cooperation is thus not only a problem of creating a scientific record that is relevant and accessible to decision makers. Epistemic cooperation also requires that the information be produced in such a way that decision makers who do not directly have access to or the ability to assess the raw scientific research are confident that the information is nevertheless a suitable basis for decisions.

As with other kinds of cooperative problems, states often create institutions ("epistemic institutions") that govern the translation of scientific information into usable information and its subsequent dissemination to decision makers. A key question for policymakers and those interested in the design of international institutions is the circumstances under which epistemic institutions should be under the control of legal institutions, and the circumstances under which epistemic institutions should be independent of legal institutions. In practice the relationship between epistemic institutions and legal institutions varies greatly across regimes. Some institutions, such as the International Whaling Commission, integrate legal and epistemic functions within a single regime. Other regimes rely on independent epistemic institutions. The WTO, for example, relies on independent institutions such as the Codex Alimentarius Commission to set food safety standards that when enacted by member states are presumptively valid under WTO rules. In the middle are networked institutions, by which I mean institutions that are formally independent of each other but are enmeshed in long-term relationships that create some mechanisms of influence across institutions. To give but one example, the United Nations Environmental Programme (UNEP) serves as the secretariat for a number of international environmental institutions and the umbrella organization for associated epistemic institutions such as the Intergovernmental Panel on Climate Change. This role at the centre of epistemic and legal institutions allows UNEP to influence and to some extent coordinate the work of those institutions.

INTEGRATION AND FRAGMENTATION IN EPISTEMIC COOPERATION

When should epistemic institutions be independent? I argue that epistemic institutions should be independent of legal institutions when there are a wide range of actors – international organizations, states, and non-state actors such as business interests – that are incentivized to act individually on the basis of scientific information produced by an epistemic institution. From a policy standpoint, this suggests that epistemic institutions engaged in the development and transfer of technologies designed to address a particular cooperative problem should be independent of the legal institutions created rules governing the same problem. For example, technology transfer to deal with climate change problems should be independent of institutions like the UNFCCC in which international legal rules regarding climate change mitigation measures are being negotiated. Likewise, epistemic institutions producing information about health and safety measures, as the World Health Organization does in relation to the Framework Convention on Tobacco Control or the Codex Commission does in relation to food safety standards incorporated by reference into the WTO's Sanitary and Phyto-Sanitary Agreement, should be independent because states can and do act individually upon the information produced by these bodies.

By contrast, epistemic institutions should be subordinated to legal institutions in situations in which collective action is required to harmonize policies across countries. Thus, epistemic institutions aimed at the production of information about common pool resources such as fisheries should be relatively more integrated into legal institutions. This latter prescription runs counter to much of the literature, which emphasizes the importance of the autonomy of scientific and expert bodies in international institution.

I arrive at these prescriptions by looking to the literature in law and economics on the optimal size of the firm (Williamson 1985; Gilligan 2011). The extent of hierarchical control legal institutions should exercise over epistemic institutions turns on a trade-off between agency costs that arise when institutions are independent and governance costs that arise when

the institutional relationship is managed through hierarchy (Williamson 1985; Lake 1996). In general, legal and epistemic institutions should be integrated when agency costs are high and governance costs low. They should be independent where agency costs are low and governance costs are high. And where both costs are high, more complicated forms of networked governance that seek to preserve independence while eliminating incentives to shirk may be optimal.

Agency costs refer to costs imposed on a legal institution when an epistemic institution allocates its resources in such a way that it does not provide scientific information that is relevant, accessible, and credible to decision makers. This is costly when decision makers are left without a usable scientific record on which to make decisions. Hierarchy can reduce agency costs by allowing legal institutions to control epistemic institutions. Legal institutions can direct that work be done on a particular problem and can determine the allocation of funding towards particular priorities. Hierarchy, however, introduces its own set of costs arising from the need to actively govern the relationship between the legal institution and the epistemic institution. In effect, the possibility of opportunistic behaviour shifts from the epistemic institution to the legal institution, which may use its authority to distort the operation of the epistemic institution (cf. Lake 1996).

Agency and governance costs can arise in a variety of situations. I focus here on the trade-off between a lack of credibility of usable scientific information that can arise from independence (an agency cost), and limits legal institutions may place on the development and dissemination of usable scientific information in hierarchical relationships (a governance cost). Fragmenting epistemic and legal institutions can introduce opportunities for epistemic institutions to undermine the credibility of the scientific record in two ways. First, scientific institutions could shade their reports in an effort to influence the legal institution's ultimate decision. Second, raw scientific and technological information is often in the hands of a small group of states that wish to persuade others to regulate on the basis of the scientific information in their possession. In many cases, information- and technology-rich states are developed states that push for rules that impede the development objectives of information- and technology-poor developing states. Legal institutions thus often ask developing states to agree to economically disadvantageous measures on the basis of a scientific record that developing states have not had a significant hand in compiling and

cannot themselves directly interpret. Successful cooperation in these situations requires that developing states have confidence in the scientific record. Allowing developing states to participate in the management of the production of the scientific record may help alleviate their concerns about whether the scientific record is being manipulated opportunistically by developed states. For example, during negotiations on rules to govern trade in persistent organic pollutants, Eastern European states with economies in transition were provided financial support and the right to participate in the scientific assessment process conducted within the relevant legal institution, the Convention on Long-Range Transboundary Air Pollution. These states would otherwise not have been able to participate in the scientific process, but because of their ability to participate they accorded much higher levels of credibility and legitimacy to the resulting scientific assessments (Selin-Eckley 2003).

On the other hand, the dissemination of scientific information can be adversely impacted by hierarchical control of epistemic institutions. Legal institutions may not wish for certain kinds of scientific information to be disseminated, either because the information works against the policy interests of states that control the institution, by making environmental regulation seem more or less desirable, or because it works against the states' economic interests. Technology transfer mechanisms in environmental institutions illustrate the risk of hierarchical control of epistemic institutions. These institutions often seek to develop, identify, and facilitate the dissemination of technology to developing countries to address environmental and development objectives. Developing countries express a great deal of frustration with the pace of technology transfer, however, feeling that developed countries use their leverage in legal institutions to slow or block the spread of useful, but commercially valuable, technologies.

This trade-off between credibility concerns and limits on the dissemination of scientific information explains why integration is a superior form of organization when dealing with a collective action problem, but not otherwise. Collective action problems can be characterized as those problems that

require a relatively large number of states or NGOs to participate before the regime becomes self-enforcing (cf. Barrett 2003). Where collective action is necessary to solve a particular problem, resolving scientific uncertainty may change the group's incentives to regulate without changing the individual's incentives to innovate on its own. In order for epistemic institutions to be successful in helping states confront collective action problems, it must facilitate bargaining among states. Agency costs that reduce the usefulness of the scientific information produced by an epistemic institution are thus particularly pernicious where collective action is required because they undermine the primary means of harmonization and cooperation.

By contrast, where the resolution of scientific uncertainty changes the incentives of individual states or NGOs to innovate, credibility concerns are much less important because collective decision-making is not absolutely necessary (even it remains important). Rather, dissemination of information is critical because individual actors can experiment based on the work of epistemic institutions. This experimentation, in turn, can attest to the usefulness of an epistemic institution's work. Networks of policymakers can thus spread policy and economic innovations that can be unilaterally adopted. Harmonization of policies and economic activity across geographic borders is facilitated in these cases by fragmenting epistemic and legal institutions.

THE INTERNATIONAL RENEWABLE ENERGY AGENCY

The creation of the International Renewable Energy Agency (IRENA) serves as an example of the theory of epistemic cooperation set forth above. Created in 2009, the agency's chief objective is to "promote the widespread and increased adoption and the sustainable use of all forms of renewable energy" (Statute of the International Renewable Energy Agency). IRENA differs from a number of renewable energy initiatives born in the last fifteen years in that it is a stand-alone intergovernmental organization. Moreover, IRENA does very little, if any, basic scientific or technological research itself. Instead, IRENA's organizes, translates, and disseminates information about renewable energy technology in a form useful to a wide range of decision makers. In effect, IRENA acts as a node for a network of national policymakers and international legal institutions. For example, IRENA is involved in

putting together and publishing studies on the relative cost effectiveness of different kinds of renewable energy; compiling a database of renewable energy policies adopted in different countries' simplifying patent databases to ease searching for patents with renewable energy applications; and facilitating discrete technology transfers between developing countries, most notably a transfer of bio-fuel technology from Brazil to African nations (IRENA Work Programme and Budget for 2012; Meyer 2012).

IRENA's ability to execute its mission is contingent to a large extent on its institutional architecture. From the time IRENA was first conceptualized, there has been a question as to whether IRENA should be an independent institution or nested within some larger institution such as the United Nations or the OECD's International Energy Agency (IEA). Why, given the existence of these well-established institutions and their interest in clean energy research, did IRENA's sponsors nonetheless insist on establishing a free-standing organization?

The answer turns on a comparison of the agency costs resulting from IRENA's independence and the governance costs that would flow from integrating IRENA into a larger legal institution. The nature of the kind of information IRENA produces means that the agency costs associated with IRENA's independence are quite low. Information about renewable energy technology – databases of patents with renewable energy applications, renewable energy policies adopted in different countries, renewable energy resources, and reports aimed at disseminating information about the economic viability of renewable energy technologies and the legal and policy environments that promote investment in renewables – is useful to and can be acted on individually by a wide range of govern-mental and non-governmental actors. The credibility of IRENA's work can thus be tested in a decentralized fashion, rather than having to be established through oversight of its work. Moreover, high demand from different information consumers preserves the incentives for IRENA to invest in developing high quality usable scientific information.

While the agency costs are relatively low where IRENA is concerned, the governance costs associated with integrating IRENA into a larger legal institution were perceived to be quite high. The German government, IRENA's principal sponsor, expressed concern that subordinating IRENA to the OECD/IEA would entail significant governance costs in the form of diversion of resources by the legal institution away from IRENA's mission in favour of competing priorities (particularly petroleum-based energy research). The German government also feared that the distributive considerations at play in the dissemination of renewable energy technologies would result in blocking IRENA's mission if it was placed under the auspices of the UNFCCC. Indeed, fights over intellectual property rights within the UNFCCC led to the demise of the Expert Group on Technology Transfers and the creation of the Technology Mechanism (which notably dropped the "transfer" aspect of "technology transfers" from its name). These governance costs could be eliminated by establishing a freestanding institution. Ultimately, the German vision of fragmenting epistemic and legal institutions in the energy/climate change regime complex prevailed.

CONCLUSION

Scientific uncertainty is a pervasive problem in modern international law and international relations. Many cooperative problems cannot fruitfully be addressed without international cooperation aimed at reducing scientific uncertainty about specific policy problems. Science and policy are, however, fundamentally different spheres of human activity. The question thus arises whether epistemic institutions should be integrated into or left independent of more traditional international institutions tasked with producing legal rules aimed at harmonizing policies and activities across governments. Yet a one-size-fits-all prescription is unlikely to yield good policy across issue areas. Instead, policymakers should pay attention to the way in which different kinds of information are used and how it changes the incentives of economic actors and governments.

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4.5
Talent wants to be free
Orly Lobel

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Talent wants to be free – Human capital and knowledge flows

INTRODUCTION

The knowledge economy and human capital controls Intellectual property controls and restrictions on job mobility - non-compete contracts, trade secrets and non-disclosure agreements, and pre-invention intellectual property assignment – are a growing frontier of market battles. Skill, talent and knowledge are increasingly subject to propertization and control, yet the effects of these controls on economic development are not fully understood. The traditional economic view has been that these controls over human capital are necessary to encourage industry investment in research and development. Yet, a growing body of scientific evidence suggests that successful industries and regions flourish from talent mobility, information flows, and knowledge spillovers.

Several interrelated developments have coalesced in recent years: dramatic changes in labour markets; a deepening in what we know about the science and economics of innovation; and a rise in legal battles over human capital. First, the new economic realities of the early twenty-first century, characterized by high turnover, lack of job security, fast-paced global competition, and a growing reliance on knowledge work are transforming the role of human capital within markets. If in the past, work was characterized by narrowly defined tasks and strict managerial supervision, today workers are expected to self-direct, exercise independence of thought, and be creative and inventive. The patterns of the work-life cycle have also dramatically evolved. Today

employers constantly recruit new talent while workers are expected to manage their careers and frequently re-skill without expectation of long-term employment.

Second, the accumulation of scientific knowledge about how innovation successfully occurs is enabling us to assess different strategies and policies. The science of innovation, a field that crosses disciplines, provides us with new insights how policy and practice can best support industrial and regional development. We can better understand the ways knowledge accumulates, flows, and progresses.

Third, the heightened significance of human capital as a valuable resource has also meant record numbers of disputes and conflicts (Lobel 2009). Indeed, in some regions and industries it is common to calculate litigation expenses as part of the costs of a new start-up. Controls over human capital have become widespread in almost every industry. These controls include both contractual and regulatory constraints on the use of knowledge, skill, and information acquired during employment:

*(1) **Non-compete contracts.***
*(2) **Trade secrets and non-disclosure agreements.***
*(3) **Employee duties of loyalty, including prohibitions on customer and co-worker solicitation.***
*(4) **Employee-employer ownership over inventions and creative ventures, including pre-invention patent/copyright assignment agreements and work-for-hire policies.***

Each of these modes of controlling human capital is subject to law and policy. Around the world, policymakers and business interests are debating reforms, signifying the discontent with out-dated and misguided policies.

The tension of controlling knowledge is clear: in its natural state, information travels freely. Without effort, ideas flow freely; multiplying without running out. At the same time, information has significant (and growing) commercial value. The scope of intellectual property is a hotly issue. From music file sharing to drugs for AIDS patients in the developing world, intellectual property generates heated public debate. Most scholars agree that in general, intellectual property is a necessary evil: it promotes innovation by creating a partial monopoly. Almost a decade ago, an open letter to the Director-General of the World Intellectual Property Organization (WIPO) by 69 prominent scientists, economists, academics, and activists (including Nobel laureates Joseph Stiglitz, Sir John Sulston and Harold Varmus, sounded the alarm on "excessive, unbalanced, or poorly designed intellectual property protections" (Butler 2003). The letter called for updated approaches to knowledge building and sharing. And yet, while the expansion of intellectual property has triggered lively debates, under the radar, "excessive, unbalanced and poorly designed" (to borrow the language of the letter to WIPO) human capital controls have continued to expand by the rise of non-compete contracts, trade secret controls and non-disclosure agreements, and pre-invention assignments of ideas and creations from individuals to firms. When we turn to the science of innovation, the costs of controlling human capital become more apparent. Nobel Laureate Elinor Ostrom described knowledge as "a shared resource" and "a complex ecosystem", defining knowledge as all intelligible ideas, information, and data (Hess and Ostrom 2006). New research underscores that over-expansion of controls over knowledge is detrimental to economic development.

UNDERSTANDING KNOWLEDGE FLOWS

Utopist cyber thinker Stewart Brand is famous for coining the phrase "information wants to be free." When knowledge is embodied in people, the phrase is even more powerful: "talent wants to be free". New field and experimental data allows us to better understand the effects of over-propertizing our talent pools – human capital and knowledge – can be detrimental.

Innovation depends on the flow of knowledge and people in a competitive market. Almost half a century ago, Nobel laureate Kenneth observed that "mobility of personnel among firms provides a way of spreading information." Contemporary markets and new scientific studies provide empirical bases for Arrow's assertion. In blunt economic terms, the deadweight loss from controls and restrictions over human capital is the person herself who is prevented from using her talent, skill, energy, and passion. To understand the full extent of the cost of human capital controls, we must understand the multiple facets of knowledge.

Tacit knowledge
Knowledge does not only rest in the codified items we consider intellectual property – ownership in patent, copyright, trade secrets. Knowledge is also the human skills, communications, and know-how that exist within people. Direct interactions between people are the primary vehicle of transmitting these forms of knowledge. Even in the age of information, when the digital sphere provides abundant access to knowledge, knowledge flows still rely on direct human communication. Knowledge is frequently difficult to transmit simply by reading a patent document or a scientific journal. Knowledge remains tacit both because of the nature of certain types of knowing and because, even when knowledge is amenable to codification, those holding the knowledge often lack incentive to codify it (Agrawal 2006). Machlup (1983) called it brainwork, emphasizing that beyond "knowing that" exists a "knowing how". Polanyi similarly distinguished between connoisseurship, or the art of knowing versus skills, the art of doing. Put otherwise, knowledge is both a resource society possesses and the very essence that constitutes as a society (Reichman and Franklin 1999; Braman1989). Given that information that exists externally to human capital does not capture the fullness of human knowledge, one of the central ways knowledge in its depths and multiplicities flows in the market is through employee mobility.

Relational and networked knowledge

Beyond the flow of tacit knowledge, mobility and interaction of people creates opportunities for connecting distinct bodies of knowledge. Isolation impedes knowledge. Conversely, social interaction spurs creativity. Social and professional relationships facilitate the flow of knowledge (Agrawal, Kapur and McHale 2006). The more collaborators an individual has, the more likely she is to participate again in a collaborative venture (Singh 2005). Work has largely shifted from individuated to collaborative and coordinated production. Relationships persist after people move, forming professional networks where past colleagues remain acquaintances and potential collaborators. A series of new studies test the importance of collaboration of professionals over time and the relationship between networks and entrepreneurship (Nanda and Sørensen 2009; Wuchty, Jones and Uzzi 2007; Jones, Wuchty and Uzzi 2008). Social interaction are necessary to seed the first ideas for groundbreaking inventions (Hansen 1999). Related to the effect of increasing interaction and collaboration, the flow of human capital increases the density of professional networks. The density of a professional network is highly correlated with the number of inventions in that network. In other words, the greater the number of people in contact, the more creative each member of the network becomes.

Local knowledge

Network science has developed significantly in the past several years, exploring the patterns of links formed over time through professional ties, friendships, communication, or commerce (Carrington, Scott and Wasserman 2005; Cowan, Jonard, and. Zimmermann 2007). One general consensus emerging in the literature is that the effects of knowledge flows are geographically localized (Thompson and Fox-Kean 2005). The spread of ideas is always patterned by the density of the network, the geographic proximity of the transmission and the complexity of information being diffused (Mardsen and Friedkin1993). Connections between innovators increase the overall numbers of patents in a region, as well as the number of co-authored patents (Breschi and Lissoni 2003; Ameida and Kogut 1999; Jaffe, Trajtenberg and Henderson 1993). Geographic density of creative ventures allows talented people to attend professional meetings, to meet face to face, and to form social connections with other like-minded innovators in one's field. Spatially connected industries also facilitate the exchange of personnel and more efficient job placement in times of shifting needs. These effects help explain how certain localities are magnets for creative people.

Some regions have been more cautious about expanding controls over human capital. For example, under existing law, a minority of states in the United States, with California being the primary example for this exceptional policy, do not enforce non-competes in the employment relationship. Similarly, a minority of states provide statutory limits on the ability of employers to contractually pre-assign all employee inventions. These regional variations provide a natural experiment to uncover the effects of human capital protections on innovation and to test the models and insights. Looking at policy differences across regions, field data challenges the conventional assumption that more controls over human capital will ultimately increase incentives to innovate. In regions like the Silicon Valley - where talent mobility has long been supported by public policy by prohibiting non-competes - small isolated networks transition more quickly into one giant component (Fleming and Frenken 2007; He and Fallah 2009; Almeida and Kogut 1999). A virtuous circle can be put into motion geographically where labour mobility supports networks, which in turn enhance regional innovation. In sum, localities with dense connections and talent flows enjoy more innovation than regimes in which human capital is strongly subject to propertization.

Motivational knowledge

Human capital - the knowledge embedded within and networked among us - is not a static resource the way real-estate or the building blocks of a construction company serve the goal of a completed building. Human capital is simultaneously a resource and the human subject that decides its quality and outputs. In other words, it is a motivated resource. Non-competes and other controls over human capital, may, under certain conditions, discourage employees to invest in their work performance. In recent behavioural studies designed to identify the effect of human capital controls and contractual arrangements on performance and motivation, participants more bound by non-compete agreements performed less well and were less motivated to stay on task than those who were unbound (Amir and Lobel 2012). These experimental findings are also supported by recent field data. Relying on state-by-state codification of the strength of non-compete enforcement, field studies show that tougher non-compete enforcement strongly reduces executive mobility, reduces R&D spending and capital expenditures per employee, lowers executive salaries, and shifts compenzation from bonuses and performance based pay to a heavy reliance on a base or fixed salary (Garmaise). In sum, from a motivational viewpoint, controls over human capital

may discourage investment in a person's own skills, because inter-firm competition over the person is less likely to occur, thereby changing not only the quantity but also the quality of knowledge flows.

Disruptive knowledge

Asking people to receive and generate ideas is no small feat and often entails a psychological shift. Not Invented Here (NIH) is an institutional pathology. Early on, NIH was linked to nationalism –companies and consumers often refused to adopt innovation developed outside national borders. For example, Japanese and American markets largely ignored home computers produced by British companies. Japanese cars, now some of the most popular automobiles in the world, were at first slow to reach beyond the domestic market because dealers and consumers preferred national products. With the globalized market that exists today, nationalism in innovation is almost non-existent. Fast-paced markets require companies to adopt external innovations and must purchase and exchange valuable research, knowledge, and ideas from everyone everywhere. And yet, even in the face of successful advancement by other companies, old habits die hard.

Evidence still suggests that firms, often to their detriment, overlook outside ideas and solutions simply because of their not-invented-here quality. Not surprisingly, NIH Syndrome happens more often in settings where there is little employee turnover. Pathologies of groupthink – where cohesive groups overlook important alternatives because of the desire for consensus and conformity - and NIH mentalities are exaggerated when companies are overly stable. In one study, teams with little turnover became progressively less productive (Katz and Allen 2007). Another study shows that NIH mentalities are more pronounced in small towns (Agrawal et al 2009). New hiring triggers changes in strategic directions of businesses, introduces "new blood" into the system, and mitigates groupthink effects. Good ideas are out there, but only companies with a structure of openness will be able to increase their absorptive capacities for innovation. Companies that close themselves off - sinking into the depths of secrecy and controls- are limiting their capacity to recognize and make use of external valuable information.

ENDOGENOUS GROWTH, BRAIN CIRCULATION, AND ECONOMIC DEVELOPMENT

The design of human capital policy must be understood as central to any development effort. For knowledge in all its facets to flow, for networks to densify, for face-to-face interaction to succeed in transmitting tacit knowledge, for innovation motivation to remain high, for "new blood" to disrupt stagnated paths, mobility must be encouraged. Talent and ideas breathe life to the competitive spirit. When talent is made to take professional detours; when minds are made to suppress creativity and ideas; when knowledge is cut up to small fragments and is deemed confidential proprietary information – society as a whole loses. As the world has "flattened", to borrow journalist Thomas Freeman's terminology, competition occurs on a larger geographical scale. Yet, place still matters. Understanding the ways knowledge networks are constituted helps us think about the issue of "brain drain". A recent World Bank report indicates that over fifty per cent of the university educated population of many developing countries lives abroad (Global Economic Prospects 2006). Still, expatriate talent can contribute to the development of countries of origin. As the World Bank Report states, "actors in Diaspora networks can be crucial bridges between global state-of-the-art in policy, technological, and managerial expertise and local conditions in their home countries." As talent moves around the globe, we can reframe human capital flows as "brain circulation" (as opposed to "brain drain"), emphasizing the benefits from the travels of immigrant knowledge workers (Saxenian 2006). High-tech employees now circulate regularly between countries like the United States, Japan, China, Israel, and India, enhancing the knowledge networks of both the receiving and sending countries.

Our world is one that flourishes on fluid movement. Human capital controls are akin to migration restrictions, although they can in fact contribute to exodus from countries that enforce non-compete restrictions to those that promote mobility and flow. On a global scale, differences between the quality of human capital have become key to understanding the challenges of developments. New models of economic growth help in linking between human capital flows and regional success (Romer, 1986; Lucas, 1988; Lucas 1990; Jones 1996). Under endogenous growth theories, economic growth relies not simply on competitive win-lose production but on processes of positive spillovers, in which knowledge is transferred within firms, industries, and regions.

An enduring puzzle for development economics has been the fact that similarly situated countries diverge so significantly in their rates of growth. Economist Paul Romer developed a model to explain these differences, suggesting that it is not only the raw access of companies to capital and labour that determines success, but also the availability of local knowledge and its dynamics. According to Romer, economies of specialization, where a region choses to focus for example on electronics (Japan) or haute couture (Italy) are efficient and lead to regional success. Because knowledge is predominantly industry-specific, geographic concentration will create positive growth for the entire specialized economy. Paul Krugman in Geography and Trade similarly explains how nations have important economic advantages depending on their regional location and industrial positioning. Michael Porter in The Competitive Advantage of Nations also investigates how regional industrial clusters give nations a global competitive edge. Porter views better enforcement of antitrust laws to end monopolies and lessen the impediments on competitive entries as essential for development. Monopolies as we argue here are not simply about good and services. Constraints on talent mobility are a form of anti-competitive market structures.

CONCLUSION

Rapid changes in the current economy have uprooted traditional notions about work, economic growth, and innovation. The transition to a knowledge-based economy means that we must rethink the ways law and policy shape the market for skills. We must ask whether the innovation ecosystem supports information sharing, and successful scientific and creative pursuits. New empirical studies indicate that the more information flows freely, the more innovation we will witness. This suggests that we frequently have too much, not too little, protections against dissemination of information – too many walls around knowledge and creative resources. Boyle (2003) warns of the Second Enclosure Movement, the enclosure of the "intangible commons of the mind" through rapidly expanding intellectual property rights. When we understand the breadth of the under-the-radar ways in knowledge is enclosed, not simply through intellectual property but by policy and contractual control of the inputs of knowledge, on the minds themselves, assigning skills, know-how, and innovation energy to single companies, the dangers of a Third Enclosure Movement become salient. Talent wants to be free and national and international human capital policies must support its flow and nourishment.

Economies of specialization, where a region chooses to focus – such as electronics in Japan or haute couture in Italy – are efficient and lead to regional or global success.

4.6
Importance of knowledge networks

Michele Clara

Importance of knowledge networks in industrial policymaking and related learning processes – UNIDO's experience

In a recent and very influential publication on the subject, Nobel-laureate economist Joseph Stiglitz, recalls the time "when industrial policies, for both developed and developing countries, were bad words not to be spoken either in public or in private by respectable people"[xv]. Indeed, it has taken less than a decade for convictions and principles that used to be dominant, and enshrined under the heading of the Washington consensus, to be set aside, as something little short of an industrial policy renaissance has been ushered in. Economists that used to be kept respectfully at the fringe of the academic and media debate, such as Ha-Joon Chang or Dani Rodrik to mention but a few, have become household names in the development community and often beyond.

Robert Wade, in a recent article, explains succinctly how this turnaround came about[xvi]. As he writes, the last decade has witnessed the rise to global scale of companies from emerging economies, which retained a stronger sense of national identity than western counterparts and often received significant state support. Their challenge has made the public more aware of nationality issues and suddenly more sympathetic to the idea of public support. This shift in orientation, argues Wade, has been reinforced by the unprecedented state intervention in most OECD countries in response to the global financial crisis and ensuing slump, which started in 2007 and seems to be still well under way in some of these countries. Finally, the global debate has become more conducive

to the idea of a policy intervention on account of the looming threat of climate change calling, in no small part, for the de-carbonization of production processes and the establishment of a green economy[xvii].

Readers familiar with the economic development debate will surely appreciate the above as (yet another) swing of the intellectual pendulum on the role of the state in the process of economic development. Since the seminal contribution of Adam Smith on the determinants of the wealth of nations, economists have hotly debated if the market system can provide sufficiently effective incentives and coordination to trigger the shift of productive resources from low to higher-productivity sectors, a process best known as structural change. Most observers would agree that hardly at any time since the Great Depression of the 1920s and 1930s the trust in the capacity of the market system has more profoundly dented. Yet, as a very influential book of 2009 on financial crises reminds us[xviii], economists, policymakers and investors at large have repeatedly found it convenient to lapse into the "this time is different" syndrome claiming that, for some ever-changing reason, the lessons of the past are no longer relevant. Supporters of industrial policy are no strangers to such syndrome.

Before articulating the knowledge requirements that should underscore the current renaissance around industrial policy, it may hence be fruitful to look at what was said in the past around the same issue. For UNIDO this can be a particularly instructive exercise, as much of such thinking is conveniently encapsulated into its constitution dating to 1979, a time when there was comparable optimism around the potential for industrial policies. Some elements of the UNIDO constitution have visibly aged over the years, such as for example the "establishment of a new international economic order". Others, though still very much relevant, are not any longer part of the development discourse, such as for instance "the sovereign right of all countries to achieve their industrialization". Others, however, appear very much up-to-date such as the call to "create new and develop existing concepts and approaches", to "promote and encourage the development and use of planning techniques", to "provide a forum … to serve the developing countries and the industrialized countries in their contacts, consultations … and negotiations", to "serve as a clearing-house for industrial information", to "collect and monitor … analyse and generate for the purpose of dissemination information", to "promote, encourage and assist in the development, selection, adaptation, transfer and use of industrial technology", and to "organize and support industrial training programmes".

Fast-forward by over thirty years, the same issues seem to broadly re-surface in the last paper that Justin Lin produced as Chief Economist at the World Bank[xix], where he entered a passionate call for "multilateral development agencies [to] use their convening power to bring together researchers and policymakers from the developing world to exchange ideas and experiences. This convening power is one important tool in promoting South-South learning among countries of the developing world". Significantly, this call is very much in line with the first report issued by UNIDO under the framework of its Networks for Prosperity initiative[xx]. Recalling the above discussion, it may be more than legitimate to ask why, if at all, this time it should be any different and what is new, if anything at all, in this call. Interestingly, Lin's article puts forward two, and only marginally related lines, which are both worth being quoted. The first from former World Bank President James Wolfensohn: "we have been in the business of researching and disseminating the lessons of development for a long time. But the revolution in information technology increases the potential value of these efforts by vastly extending their reach". The second from Lin himself: "theories and models taught

in universities generally assume a 'first-best world,' but in the real world - especially in developing countries - there are distortions, bumps, and barriers that leave many countries far removed from the first-best situation".

All in all, the starting point for an assessment of the potential for knowledge networks in industrial policymaking is the readiness to learn from the shortcomings experiences in the past while factoring both, a pragmatic approach to problem-solving, and the enhanced scope for knowledge management provided by internet-based technologies. In terms of realism, there is hardly a better starting point than paraphrasing a recent World Bank publication[xxi]: "Determining the proper role of the state … is thus as complex as it is important". The complexity of the task does not warrant quick fixes or "one-size-fits-all" while its importance calls for ground realities to be called by their names and not assumed away.

Over the last two decades, a solid stream of literature has emerged that has tried to look at the experience of states that proved able to strengthen their own capacities to promote learning and cooperation and to deepen the networks with non-government actors, which in the end results in long-term growth and innovation. The Report of the Secretary-General of UNCTAD to UNCTAD XIII[xxii] provides a valuable and compact introduction to this literature of the so-called "developmental state". The concept arose from accounts of the role of the state in the industrialization of several East Asian economies, with Japan as the classic precursor, followed by the four "Asian tigers" (Republic of Korea, Taiwan Province of China, Singapore and Hong Kong) in the 1960s and 1970s and later by Malaysia, Thailand, Indonesia, China, and Viet Nam. These countries pursued integrated strategies based on a shared vision of the country's development, and generally enjoyed broad, though not unanimous, social consent, supported by institutional arrangements for continuous dialogue and coordination with key stakeholders. However, they also proved willing and able to discipline the beneficiaries of state support, withdrawing it when firms eventually become competitive in international markets or if they consistently fail to perform according to expectations.

The literature on the developmental state makes a convincing case around distinctive features of successful development experiences, and it hence introduces the first set of issues around which knowledge needs to be consolidated and shared and for which knowledge networks are most urgently called for. Needless to say, as experience has abundantly shown over the last few decades, the need for knowledge does not ensure that the repository of the relevant information will be ready and willing to share it, or that the networks created to gather and disseminate it will discharge their expected roles. It is also not certain that those most in need for such knowledge will be able to use it effectively, especially when the expected impact is to trigger a process as profound and structural as economic development.

The first two sets of issues that would warrant a renewed focus as an outcome of the successful experiences of several developmental states relate to the domain of global advocacy. Despite the growing number of scholarly contributions on the subject within some quarters of the economic development community, the global debate still seems to view industrialization, especially in the global South, more as a factor contributing to the key current global challenges than as a solution to them. A global advocacy campaign is needed to re-balance this discourse, which would call for innovative knowledge networks tying together development practitioners, academics from both developed and developing countries but, above all, national policymakers, especially from emerging economies. Such a campaign would probably need to be addressed towards an audience of development practitioners (though tried-and-tested platforms such as journal articles, on-line debates, multilateral conferences and the resulting declarations) as much as towards the general public (adapting the terms of what is presently a fairly academic debate to the pace of news-making companies and of the new social media). In many ways, the experience of the Millennium Development Goals proves that such campaigns can be organized within the development debate and can indeed prove successful with both audiences.

The challenge remains the one highlighted by Ha-Joon Chang in one of his 2010 articles, namely "how development has disappeared from today's 'development' discourse"[xxiii]. For much of economic history, Chang argues, development has been equated with a process of increasing structural change (initially from agriculture to industry and later within manufacturing from lower to higher value-added products), whereby the high income of a country's citizens is based on superior knowledge, embodied in technologies and institutions, rather than simple command over resources. Over the last two decades, Chang argues, "development has come to mean poverty reduction, provision of basic needs, individual betterment, sustenance of existing productive structure" – that is, anything but what it had meant to people for the previous century or so. In this process, the "growth agenda" has been marginalized from mainstream development discourse, and so has the focus on enhancing productive capacities. To the contrary, industrialization in emerging economies has increasingly become a reason for concern, be it because of its impact on the environment (deforestation, increased carbon and sulphur emissions, consumption of fossil fuels and other non-renewable natural resources), on employment levels in industrialized countries (under labels as different as off-shoring, outsourcing all the way to social dumping) but ultimately also on the social fabric of the emerging economies themselves (on account of unbalanced geographic development, rural-urban migrations, rise of slums).

Interestingly, and perhaps tellingly, much of the experiences of developmental states to date (especially the most effective ones from East Asia, starting with Japan and continuing with the Republic of Korea and Taiwan, Province of China and still very much under way in mainland China) conform to the traditional view of development and that was indeed the stated objective of deliberate interventions, which can all be branded as industrial policies. Going forward, the time is ripe therefore to re-establish the centrality of economic diversification (and of one of its core determinants, namely industrialization) to the development debate. Needless to say, such an endeavour would not be complete, unless it factored in the opportunity set that developing countries need to confront nowadays and it therefore distilled not only good practice in terms of processes, but also in terms of policy instruments and objectives.

A second, and equally important set of issues to be at the core of new or 'reloaded' knowledge networks, lies therefore with the practice of the developmental state. The policy space available to sovereign states is nowadays much different than the one they were confronted with, for example, when the UNIDO constitution was drawn up. The global rules of the game, especially on issues as minimum local content of production, intellectual copyrights and public procurement, have been deeply affected by the negotiations at the World Trade Organization. Resource scarcity, most apparent in energy commodities but increasingly affecting many more minerals as well as agricultural produce and even water, is introducing new trade-offs in the sustainability projections that any long-term planning exercise needs to factor in. Last but not least, the propensity of citizens, especially young and educated ones, to remain complacent in the face of mounting social inequality has been severely dented by the growth of new media, as vividly portrayed by the Arab Spring. At the same time, however, competition for scarce resources is providing many developing countries in Africa room for manoeuvre in their international negotiations that has simply not been witnessed before. The scope for increased mobility for graduates around the globe is closing skill gaps that have for decades prevented home-grown development in the global South while remittances from the diaspora are often much larger than the more traditional flows of development assistance.

In view of the above, policymakers (be they in the public or in the private sector, in capitals or at the local level, in countries or in regional/global organizations) have nowadays to confront new trade-offs, for example between sustained economic growth and environmental sustainability, or between fast job creation in a few urban locations versus a more balanced approach to regional development. Such trade-offs have simply not been fully there before and could therefore draw inspiration from knowledge exchanges among themselves. The challenge here seems to be how to rejuvenate platforms for knowledge exchange that have, over the years, failed to keep up with the broadening spectrum of policymaking activities, way beyond the domain of governmental discussions. The identification and

customization of new policy instruments (capitalising, for example, on the greater scope for engagement with the private sector on account of its commitment to a corporate social responsibility agenda or the professionalization of the global NGO community) ought also to be the target of dedicated knowledge management initiatives. Ultimately, however, a new and often more realistic consensus needs to be reached in terms of what the developmental state, especially in its more interventionist objective of industrial policymaking, ought to be held accountable for, first and foremost by its own citizens and also by the global community.

The above discussion, however, should not blind us from recognising that, while some very successful examples can be drawn from the developmental state literature, a good number of people in the global South, especially in Africa and especially in the Least-developed countries, do not seem to have witnessed any lasting economic development in their own courtyards. How to engender the autonomous and sustainable transformation into a developmental state is still the number one challenge in many parts of the world, and hardly more urgent anywhere than in Sub-Saharan Africa. The call for a reform process in the African continent, for "Good Growth and Governance in Africa"[xxiv] or for a "New Partnership for African Development" are increasingly being raised, and yet a full appreciation of the scope and magnitude of such processes is still very much elusive.

Here lies the third, and probably most challenging and sensitive pillar of a knowledge network that can rise to match the expectations of the 21st Century. The development state literature provides plenty of evidence of how, under specific circumstances, public institutions that were not highly regarded, either for their strategic or implementation capacity, rose to the test. It is no secret, for example, that United States' development agencies almost universally "found [the Republic of] Korea a nightmare, an albatross, a rat hole, a bottomless pit"[xxv] and even in the middle of the 1960s some American academics despaired of the 'dawn' of the day when Korea might become anything more than a permanent ward"[xxvi]. Surely this is no longer the case, only a few decades later.

Accounts of how such a turn-around was possible are admittedly scarce and clearly context-dependent. As a result, the study of how a state succeeded in becoming developmental may only serve as a source of inspiration for other countries in a similar situation and with similar objectives, but surely cannot serve as a recipe to be cut-and-pasted from one context to another. In a nutshell, a more multi-disciplinary assessment of what lied, and hence can lie, at the core of such political changes is not only urgently needed, but also very likely to provide greater space for the experimentalism and pragmatism that Lin sees as a new feature in the developmental debate in the 21st Century. Knowledge networks are called for to overcome disciplinary barriers that no longer, if ever, make sense. Policy advisors can no longer turn their sight away from the black box of politics, and hence no longer afford to miss on the collaboration with sociologists, political scientist, and historians. And no longer can the concerns and objectives of policy activists and reformers fail to gain centrality in the work of development agencies, multilateral ones in particular[xxvii].

As argued above, several success stories in economic development and the emergence of new societal challenges are breathing new air into a much-debated issue in development economics, namely the role of the state as a prime mover in the process of economic transformation. Overstating the magnitude of this shift runs the serious risk of claiming, yet again, that things are different this time and that the development community does therefore not need to learn from its past mistakes and shortcomings. This would be a serious mistake because, as exemplified by the UNIDO constitution, the knowledge codification and management challenges related to triggering industrial development in low-income countries already figured very prominently in the debate of the 1970s. The rise of new information and communication technologies have certainly helped a great deal in reducing the transaction costs related to such codification and management, but their revolutionary nature should not be over-stated. As always, the key challenge remains clarifying what knowledge is needed, by whom, and who can provide it in the right framework and at the right time.

The study of the developmental state can help uncovering some of these issues, as this paper has tried to argue, and provide a more focused direction to the call, contained in the first Networks for Prosperity report, for a renewed emphasis from Member States around knowledge networks. As argued above, these agendas are conceptually distinct and involve different actors but they are profoundly inter-linked and should be addressed with an approach that maximises the scope for cross-learning. Reorienting the (often academic) debate around issues of growth and development ought not to take place in a manner that does not factor in the actual capabilities (both in the private and in the public sector) of the very actors at the core of very wide-ranging political reforms. By the very same token, however, there is a need to influence the narrative to which tax-payers in ODA-providing countries are exposed to and ensure that a legitimate demand for aid effectiveness does not prevent the implementation of what are inherently long-term reform processes. And finally, there is an urgent need to re-open the space for debate to scholars, activists and practitioners from the developing world.

The multilateral organizations, and especially the ones belonging to the United Nations Development System, are ideally placed to be at the core of the multi-layered knowledge networks sketched above. Not only is their mandate inherently related to a broader endorsement of the growth agenda but their day-to-day activities, especially in view of Paris Declaration on Aid Effectiveness, require a fuller appreciation of the scope for reforms by their Member States to enhance the scope for a development state. While much can and should be done to enhance their impact and visibility, global advocacy campaigns are the bread-and-butter of the multilateral organizations and, when well orchestrated, some of the few instances of consensus-building in the global arena. The convening power of the multilateral organizations is still unmatched, both in the public and in the private sector, though some concerns do arise around how such power is being used in the current context. In particular, older experiences in the field of "systems of consultations" may be revisited, capitalising on the outreach potential provided by new information technologies. Where the multilaterals seem to have a lot of space for further work is in the dissemination of the findings emerging from such consultations, especially in terms of making them palatable and accessible to a wider audience. Finally, though increasingly marginalised in the flow of development assistance, the multilateral organizations can take the lead in re-tuning the delivery of their technical assistance to pilot test some of the recommendations emerging from the above debate and exchange good practice around it, especially on themes related to monitoring and evaluation and impact assessment.

PART 5:
Networks for Prosperity – Connecting development knowledge beyond 2015
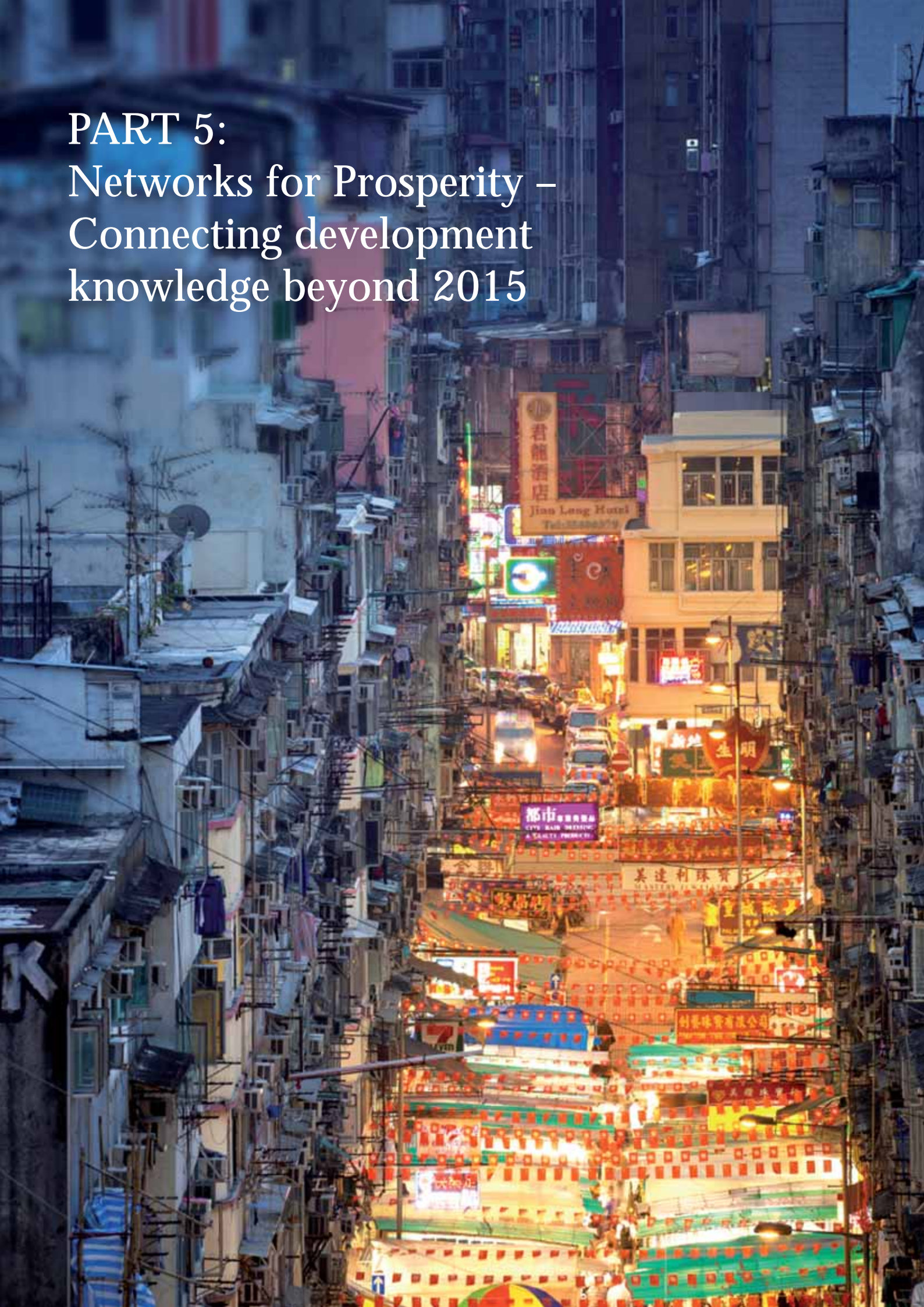
Findings and Recommendations

Axel Marx, Kazuki Kitaoka and Cormac O'Reilly

Without doubt, knowledge networks and network governance will play a crucial role in the emerging post-2015 development agenda and the new post-Busan aid architecture.

Without doubt, knowledge networks and network governance will play a crucial role in the emerging post-2015 development agenda and the new post-Busan aid architecture. Networks do not only constitute a distinct way of organizing transactions between actors but more importantly are emerging as a new paradigm for governance. A key component of this paradigm revolves around the exchange of information and the creation of knowledge. In the first Networks for Prosperity report (UNIDO 2011) we conceptually clarified this and linked it to private sector development. The first report argued that networks play a key role in diffusing information and generating knowledge and hence contribute directly to economic development. Moreover the report illustrated that network governance is becoming increasingly important on a local, national, regional and global scale. Consequently the report introduced network governance as a distinct way of governing. Most importantly the report made a conceptual distinction in types of networks in order to clarify that networks differ in nature and that this difference is relevant in the context of knowledge management and information provision. The key points stressed were:

1. *Networks are crucial for information exchange and knowledge creation and diffusion and contribute significantly to knowledge management.*

2. *Networks are becoming increasingly a distinct form of governance with the aim of including different types of public and private actors within and across organizational and national boundaries.*

3. *Not all networks are equivalent and differ in nature. Different types of networks exist and some are more instrumental in the context of learning, information exchange and knowledge creation.*

4. *There is a significant benefit to be gained from institutionalizing or embedding networks and hence investing in networks. The creation of trust and social capital which follows from this is beneficial for organizations and the economy as a whole.*

5. *It is crucial not only to embed networks but also to be involved in other or new networks which will provide new information, knowledge and opportunities.*

6. *From an actor's or organization's perspective successful networking implies the development of solid networks which continue over time and are built on trust; and constantly moving between relevant other networks to capture new information.*

7. *Networks are proliferating. Given the increasing choice of networks, the importance of seriously investing in some networks and institutionalising network ties in these networks (high administrative co-ordination cost) and the importance of balancing arm-length ties with embedded ties it is becoming important to develop clear networking strategies with specific objectives.*

8. *Knowledge on networking strategies and managing effective and efficient networks is more limited. Efforts to generate knowledge and best practices on network management and the development of network strategies, especially in the context of private sector development, would be welcomed. The latter can be achieved via study visits, workshops or illustrative case studies. These activities can contribute to identifying success factors for network management.*

This second report builds on this in several ways. First, the report launched a new edition of the connectedness index and compared it to other indices. Indeed, since the launch of the first report we saw several related new indices see the light. Many of these build on earlier efforts to capture a degree of globalization and basically measure the degree to which countries are internationally networked or integrated. The UNIDO Connectedness Index is conceptually distinct in that it not only measures the degree to which countries are internationally, externally networked but also internally. Indeed, as many contributions in this report highlight, the importance of networks lies not only in making international connections, but also internally. Jacint Jordana highlights the network nature of many regulatory agencies across the world and Johan Adriaensen identifies distinct forms of network organization in the context of trade policy in three distinct policy administrations. Proposing a multi-level concept of connectedness captures better the ideas embedded in the notion of network governance. What emerges from these rankings is not so much a division between the 'North' and 'South', but

between highly networked societies and less networked societies, countries moving from the periphery to the core grasping the importance of being connected. The hypothesis is that those countries that understand the importance of networks, as is illustrated in the case of Costa Rica, can develop distinct advantages in their pursuit of prosperity.

Secondly, the report presented a set of case studies which delve further into the diversity of networks and highlights that network governance ranges from the local to the global and from public actors to private actors such as NGO's. Thirdly the essays in the third part reflect on different key aspects related to network governance focusing on the diversity of networks (Bolisani) and the importance of overcoming different types of barriers in effective network governance (Mirić). These essays also reflect on key issues in relation to the management of knowledge in international organizations and beyond. Tim Meyer describes different strategies and governing knowledge in international organizations and Orly Lobel expands the issues by reflecting on how different types of knowledge should or should not be governed. The implications of these contributions are profound. They sketch a silent transformation which (international) organizations have to confront. This transformation is one in which knowledge is managed in hierarchical terms within the boundaries of an organization to a context in which knowledge moves in and out of organizations depending on the networks in these organizations operate. How to deal with this will have significant implications for the design and management, including the human resources management, of these organizations. As Michele Clara identifies, this opens opportunities for international organizations but will also require vision and a well-developed change management plan.

To further investigate these profound changes the United Nations Industrial Development Organization (UNIDO) and the Leuven Centre for Global Governance Studies (GGS) intend to further collaborate. Expounding the dynamics of networks and network governance is the goal of the partnership between UNIDO and GGS. This undertaking combines UNIDO's recognition of networks as major contributors to private sector

development. To this end, UNIDO founded a concerted, long-term programme to utilize knowledge networks to support developing countries in acquiring and adapting PSD-relevant knowledge to their specific contexts and needs. Research at the GGS undergirds these efforts; recognizing networks as an emerging governance structure, the profound lack of scientific research on this phenomenon, and the potential for such research to more efficiently utilize network to reach development goals, the partnership has identified three intermediate goals to better understand the dimensions of network governance.

First, our partnership strives to more concretely define network governance. Initial collaboration identified three levels on which networks operate (the inter-governmental, inter-organizational, and intra-organizational levels) and three general types of networks (learning, information exchange, knowledge management), but networks as governance mechanisms remain poorly conceptualized. To this end, research empirically and qualitatively analyses various network structures between and within countries, among private and public actors; doing so allows a more accurate picture to be drawn of the capacity for networks to more succinctly identify how these networks govern. The policy interest that prompt such a question triggers a theoretical investigations into market-based, hierarchical, and network governance architectures and their relevance given recent patterns and innovations in global governance. In order to achieve this aim the partnership will continue to approach network governance from a multidisciplinary perspective, taking into account the various political, economic, sociological, psychological and legal studies of network governance building on the group of experts who are already involved in the initiative.

Secondly, the partnership aims to gain in-depth knowledge on the emergence, development and effectiveness of networks with special attention to private sector development and success factors for designing network forms of governance. Here we will have to break new ground. The essays and cases gathered in this report point to some success factors in terms of strategy, leadership and culture but also provide a canvass of the diversity of issues and organizations we capture under the umbrella of networks. Identifying success factors will require understanding this diversity. There will be no one-fit

for all. In this context it is also crucial to better understand what we mean with success factors of effective networks. Effectiveness of networks can be understood to mean different things to different people. As a result, it is important to approach effectiveness as a multi-dimensional concept which can be analysed according to a number of interrelated dimensions, which include problem solving effectiveness, process effectiveness, behavioural effectiveness, constitutive effectiveness and evaluative effectiveness. These different dimensions capture different elements of effectiveness:

○ Goal attainment/problem solving effectiveness refers to the degree to which specific goals, as stated for example in the mission statement of a network organization, are achieved.

○ Process effectiveness refers to the degree knowledge generated in a network is adopted by the partners of the network.

○ Behavioural effectiveness is a measure of the degree to which the network and the knowledge generated in a network generates differences in behaviour and practices of the members or actors in the network.

○ Constitutive effectiveness refers to the acceptance of a network by a large group of stakeholders as a key institution in a given policy area.

○ Evaluative effectiveness assesses networks on a set of criteria such as equitability and legitimacy.

As a result, networks can achieve different things and be effective on one or more of these dimensions. If we want to understand factors contributing to success we need to understand how networks make an impact on these different dimensions. The partnership will continue to investigate this and build a knowledge base on designing effective networks to achieve public policy goals.

A third aim is to empirically capture the importance of networks. Here, attention focuses on constructing an empirical measurement of networks, which can evidence the tangible effects of networks on PSD and progress towards international goals, such as the current MDGs or the new development agenda expected to emerge after 2015. This empirical measurement is developed at the nation-state level and seeks to explore variation between countries. The 2011 Networks for Prosperity report contains a first attempt at describing networks in its construction of a global Connectedness index, which is followed in this report by presenting the 2012 Connectedness Index. The same caveats as identified in the first report remain and trigger our eagerness to develop better and strong indicators and indices. As argued by many leading scholars Governance by Indicators is becoming an important instrument to steer policies of countries and stimulate convergence on specific parameters. For governance by indicators to work, we need robust and validated indicators. We already have a pool of relevant indicators but much more empirical work needs to be done to better capture the degree of connectedness.

These three aims and challenges will define the further analytical work in the framework of the Networks for Prosperity initiative and will act as a guide in expanding the number of experts who are involved in the initiative. What we are witnessing and aim to grasp is a paradigm shift in governance in which a key role is reserved for international coordination and cooperation. Multilateral organizations, by nature, are central players in this new governance context. However, a particular focus should be put on the increasingly dominance of South-South cooperation and the emerging leadership of middle-income countries in the post-2015 development landscape.

THE FIRST NETWORKS FOR PROSPERITY REPORT (UNIDO 2011) RECOMMENDED THAT

(i)   The international community should actively promote knowledge networking and network governance structures for achieving local, regional and global development objectives;

(ii)   Member States should encourage and facilitate the international knowledge networking capacities of their own public and private institutions;

(iii)   International organizations should improve their inter-institutional information and knowledge exchange systems and facilitate better knowledge networking among their members; and

(iv)   An international and cross-sectoral consultation network should be established to further develop the initial findings.

Recommendations

While all four initial recommendations remain valid and highly relevant, it can be observed that progress has been made on all four levels, in particular in the framework of the emerging post-2015 development landscape. However, more work needs to be done. Based on this and the findings and conclusions of experts in this second Networks for Prosperity report, THE FOLLOWING ADDITIONAL RECOMMENDATIONS HAVE BEEN FORMULATED FOR CONSIDERATION BY MEMBER STATES:

(v)   *The international community should recognize that knowledge networks, multi-sector partnerships and network governance should be at the centre of any emerging post-2015 development agenda as these are crucial ways and means towards tackling the complexities of today's state of development and globalization.* In particular, a bigger picture approach should be taken in the deliberations on the future of MDG-8 on the global partnership for development, enriching it with considerations of knowledge networking and network governance, and mainstreaming it to the centre of the development agenda. It should be recognized that without knowledge sharing and networking, including technology transfer, sustainable and inclusive patterns of global development cannot be achieved.

(vi)   *Middle-income countries should enhance their role in global development cooperation through intensified knowledge networking, policy coordination and the establishment of network governance structures in fields of their shared interest.* In particular, it is proposed to organize a conference of middle-income countries to allow for focused deliberations on such shared interests in the fields of inclusive economic growth, sustainable development and finance for development. It should be recognized that without the pro-active and constructive cooperation and collaboration of middle-income countries, no meaningful global development agenda, strategy or goal can be formulated or achieved.

(vii)   *The international community should embrace South-South and triangular cooperation, based on knowledge exchange and technology partnerships, as effective ways for achieving development goals, and anchor these in the post-2015 development agenda.* In particular traditional donors and international organizations should consider triangular cooperation modalities for sustainably supporting capacity building efforts, especially in middle-income countries, and for ensuring long-term results and impact of development activities, beyond the immediately visible outputs. Also, middle-income countries and international organizations should actively support bilateral and multilateral South-South cooperation, both on regional and global levels.

(viii) *The international community should advance its analysis on the link between a country's connectedness and its population's prosperity as the ultimate goal of development.* In particular, international organizations, financial institutions and their academic partners should intensify their empirical research and policy analysis in this field, and collaborate amongst each other to leverage each other's knowledge. Member States should encourage their academic institutions and development agencies to actively engage in programmes that advance the understanding of the nexus between knowledge networking, economic network governance and prosperity, and support ongoing efforts in this regard.

ANNEX

Annex 1: Methodological note on the connectedness index

1. SELECTION OF VARIABLES

Three researches screened the identified datasets and made a selection of a first group of indicators. The aim was to identify variables which either directly measured a degree of connectedness or of networks or phenomena that are instrumental to strengthen networks. This initial selection was further refined considering the following criteria. First, we took into account the data coverage, both in terms of number of countries and years. Some of the selected indicators contain data only for a few sets of countries (typically, for one specific region such as barometers), and others only for one specific year that does not match with other selected indicators. As a result they were excluded from the index construction. Secondly, we performed an analysis of the content of each specific variable in order to identify indicators containing mixed concepts, i.e., composite indicators which contain networks measures but also capture other concepts that were not related to networks. If we could not separate them out we did not include them. Lastly, we performed an analysis to identify whether two or more indicators measured the same concept in order to avoid overload the composite connectedness index aggregating several times the same concept. Strongly related indicators were not included. For example, several indicators measure the economic flow between countries using more or less the same data. Another indicator initially selected for inclusion, as a proxy for inter-organizational networks, was patents. There is a significant body of literature that identifies patents as an interesting source for uncovering relations between organizations since several patents are co-owned between organizations (see Owen-Smith and Powell, 2004). However, patents do overlap with industry-university collaboration.

2. RE-SCALING OF VARIABLES

After the selection of indicators, the first step on creating the connectedness index and its three sub-indices was to re-scale each of the original indicators from 0 to 1, in order to normalize all indicators according to one identical scale. Normalization was required prior to data aggregation because the indicators have different measurement units (Nardo et al, 2005). In other words, as the original indicators have different scales - for example, 0-100 in the case of KOF political globalization, and 1-7 in the case of University-industry collaboration – we have transformed all the original indicators to one common scale ranging from 0-1, to make them comparable. We also applied the standardization method (Freudenberg, 2003), also called z-scores, that converts indicators to a scale with a mean of zero and standard deviation of one. The results of both methods were very similar and we opted for the re-scaling method, since it produces a small interval (0,1), increasing the effect of each part in the composite indicator, more than the z-scores transformation (Nardo et al, 2005).

The following procedure was used to calculate the indices.

Firstly, for the international networks sub-index:

    i.   Re-scale Political and Economic Globalization 2008 on 0-1 scale using the formula:

$$\textbf{(1) Re-scaled score} = \frac{\textbf{(Country Score – Minimum Country Score)}}{\textbf{(Maximum Country Score – Minimum Country Score)}}$$

The minimum and maximum values of all countries available in the KOF Index of Globalization 2009 were considered. For the economic globalization, KOF 2009 do not provide Actual Flows for 33 of the 208 countries for which we have calculated the international networks sub-index. For these 33 countries it was considered the average score among all countries in the same region, according to the United Nations Statistics Division Standard Country and Area Codes Classification.

    ii.   Calculate the arithmetic mean of the re-scaled Political and Economic Globalization

    iii.   Re-scale the average using formula (1)

Secondly, the Inter-organizational networks sub-index:

    i.   Re-scale Networks and supporting industries using formula (1). The minimum and maximum values of all countries available in the Global Competitiveness Report 2009-2010[xxviii] were used.

    ii.   Re-scale University x Industry Collaboration using formula (1). The minimum and maximum values of all countries available in the Global Competitiveness Report 2009-2010.

    iii.   Professional Association is the percentage of interviewees that are member of one professional association. It was created using the most recent data for each country from the World Values Survey, in the following way:

        a. For countries for which the question "Belong to professional associations" is available

$$\textbf{Professional Association} = \frac{\textbf{No. of members}}{\textbf{No. of interviewees}}$$

        b. For countries which the question "Active/Inactive membership of professional organization" is available

$$\textbf{Professional Association} = \frac{\textbf{(No. of active + No. of inactive members)}}{\textbf{No. of interviewees}}$$

    iv.   Re-scale Professional Association using formula (1). The minimum and maximum values considering all countries in the selected surveys were used. For countries whose data were not available in the World Values Survey, it was considered the average score of all countries in the same region. As there weren't countries from Oceania (apart from Australia and New Zeeland) it was considered the average score of all developing countries.

    v.   Calculate the arithmetic mean of the three re-scaled components

    vi.   Re-scale the average

Thirdly, the Intra-organizational networks sub-index was created as follows:

    i.   Re-scale the percentage of Firms Offering Formal Training using formula (1). The minimum and maximum values were used, considering the most recent survey for each country.

    ii.   Re-scale On-the-job training using formula (1). The minimum and maximum values were used, considering all countries available in the Global Competitiveness Report 2009-2010.

    iii.   Calculate the arithmetic mean of the two components. When only one component was available, the single value was considered without averaging.

    iv.   Re-scale the average using formula (1).

Lastly, the connectedness index was calculated as the arithmetic mean of its three components:

international networks, inter-organizational networks and intra-organizational networks.

For the aggregation of the indicators we choose the arithmetic mean - equal weighting (Nardo et al, 2005, p. 21) -, since this is an exploratory study and we do not intend to give privilege to one specific indicator over another one, setting distinct weights for each indicator. Also, the possibility was considered to use geometric aggregation in order to avoid full compensability, i.e. poor performance in one indicator being compensated by a high performance in other (Nardo et al, 2005, p. 79). However, as we have natural zeros in the professional association indicator, applying geometric aggregation would imply a loss of variance in our composite indicator.

3. COMPARING THE CONNECTEDNESS-INDEX ON THE BASIS OF MEDIAN

It could be objected that in theory, through the re-scaling method, the interpretation of the median may be misleading since there is a theoretical possibility for interconnectedness to be low, although the median is high, because the maximum observation in a dataset (real observations) is far removed from a theoretical maximum. In other words, one could, on the basis of theory, construct a theoretical maximum for the sub-indices and compare that with the observed maximum in the dataset. If there is a significant gap between the theoretical maximum and the observed maximum, the median might be high, but the interconnectedness theoretically low. This argument could also be reversed with regard to the minimum scores. As a result, we assume that the observed maximum and minimum correspond to a significant degree to the theoretical maximum and minimum. We did not find indications that this might not be the case. In addition, we use the median mostly for comparative purposes.

4. USE OF THE PEARSON CORRELATION COEFFICIENT

Given the linear relationship between the variables (see graphs 2.4-2.7) the Pearson Product-Moment Correlation Coefficient was used to calculate the correlation between the different indicators. The Pearson correlation(r) measures the degree of linear relationship between two variables and ranges from -1.0 to +1.0. The closer r is to +1 or -1, the more closely the two variables are related. The sign of the correlation coefficient (+ , -) defines the direction of the relationship, either positive or negative. A positive correlation coefficient means that as the value of one variable increases, the value of the other variable increases; as one decreases the other decreases. A negative correlation coefficient indicates that as one variable increases, the other decreases, and vice-versa.

The significance (probability) of the correlation coefficient is determined from the t-statistic. The probability of the t-statistic indicates whether the observed correlation coefficient occurred by chance if the true correlation is zero. In other words, it asks if the correlation is significantly different than zero.

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Endnotes

i   The paper "Being Close to Grow Faster: A Network-Based Empirical Analysis of Economic Globalization" was prepared by Georg Duernecker (University of Mannheim), Moritz Meyer (European University Institute) and Fernando Vega- Redondo (European University Institute) to be presented to the "Expert Group Meeting on Knowledge Networking and Network Governance". Contact address: Moritz Meyer, European University Institute, Economics Department, Via della Piazzuola 43, 50133 Florence, Italy. E-Mail: moritz.meyer@eui.eu.

ii   PhD fellow sponsored by the Brazilian Ministry of Education – CAPES Process n. 3957-06-03, 2007-2011

iii Paper presented at the Expert Group Meeting on Knowledge Networking and Network Governance, UNIDO, Vienna, 18 September 2012. Last revision: 15/October/2012. The author thanks the contributions of the participants in the meeting and, more specifically, the detailed comments by Bert Helmsing, Axel Marx, and Alwin Gerritsen

iv   Thomas Vogel, please find Thomas Vogel's and Petra Koppensteiner's biographies in section contributors, page 4 of this report.

v   HORIZONT3000 was founded in 2001 as the merger of three predecessor organizations, which had been founded and governed since the 1960s by the same group of member organizations – see www.HORIZONT3000.at

vi   Anton Luger, a technical advisor working with HORIZONT3000 in Ecuador in the 1990s compiled, together with his local colleague, several methodological elements and wrote a manual on systematization, (See: Anton Luger and Dara Cisneiros: Aprendiendo de nuestra experiencia. Manual de sistematización participativa; Quito, Ecuador, 2003). From then on, systematizations were carried out increasingly with HORIZONT3000 partner organizations in Ecuador and Central America.

vii Enabling Rural Innovation (ERI) An approach brought to HORIZONT3000and its partner organizations through a partnership with the Centre of Development Research (CDR), of the University of Natural Resources and Life Sciences (BOKU) in Vienna. The priority of ERI is to achieve food security in rural households before enhancing market orientation. For more information on ERI, please refer to CDR http://www.boku.ac.at/cdr.html or to the International Center for Tropical Agriculture (CIAT) - http://www.ciat.cgiar.org/Paginas/index.aspx

viii TRIALOG, an EC-cofinanced initiative, led by a consortium of 12 European NGDOs (www.trialog.org) adopted the concept of systematization to document and reflect its 12-year-experience on building NGO platforms in the EU-12 member states

ix   Clemens Schermann, Austrian theologian and life coach, technical advisor with HORIZONT3000 in Papua New Guinea from 2001 to 2003

x   Head of an NGDO programme unit comprising around 12 full-time staff, co- author Thomas Vogelcan draw on his own professional experience in HR management

xi   For a comprehensive discussion on the concept of connectedness, see: Axel Marx and Jadir Soares: "Measuring Networks across Countries: an Empirical Exploration", published in the 2011 Report on Networks for Prosperity by UNIDO and Leuven Centre for Global Governance Studies, as well as: Colleen Carroll, Jadir Soares and Axel Marx: "Measuring Connectedness" Different measures, different results? (Paper prepared for the Expert Group Meeting on

Knowledge Networking and Network
Governance, 18 September 2012, UNIDO,
Vienna)

xii   Statement by Jim Campbell / ICAP, in a Meeting
in Brussels, Mai, 2011J.Woo, (1991) Race to the
Swift: State and Finance in Korean
Industrialisation, Columbia University Press.
New York, p.46

xiii   For a good introduction to these concepts, see:
Andreia Meireles and Leonor Cardoso:
"Knowledge sharing and use of shared
knowledge: a study of their critical factors in the
business network of the central region of
Portugal" (Paper prepared for the Expert Group
Meeting on Knowledge Networking and
Network Governance, 18 September 2012,
UNIDO, Vienna)

xiv   See, for example, the Busan Partnership For
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