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Transnational Knowledge Through Diaspora Networks

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Editorial

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Traditionally, the relationship between geography, science, technology and innovation (used here broadly to describe all activities relating to scientific and techno-economic change) has been dominated by the concept of "national innovation systems" (NIS) developed in the late 1980s and early 1990s (Freeman 1988; Lundvall 1992; Nelson 1993). The NIS concept was then extended by Michael Porter (1995) to apply on a regional scale (cluster theory). The NIS approach does not give enough consideration to the role that transnational forces play in shaping and transforming local innovation environments, particularly through the factor of human mobility. In a world that is increasingly witnessing the emergence of transnational communities with extended international networks, a growing body of research on *international knowledge networks* (IKN) or *diaspora knowledge networks* (DKN) is providing more insight into the structures and processes of the agents of change that are increasingly shaping many regions around the world. IKN is defined as "a system of coordinated research, study, results dissemination and publication, intellectual exchange, and financing across national boundaries" (Parmar 2002: 13). The actors in such networks may incorporate professional bodies, academic research groups and scientific communities that organise around a special subject matter or issue. The primary motivation of such networks is to create and advance knowledge as well as to share, spread and, in some cases, use that knowledge to inform policy and apply to practice (Stone 2003).

This new way of thinking about the world is consistent with the "transnational" basis of globalisation theories, which postulate that globalisation is not only manifested by the rise of transnational corporations and entities, but also by that of *transnational communities* and, consequently, *transnational geographies*. While a wealth of research has explored the development and operation of transnational business entities (e.g. corporations), it is only recently that the concept of transnational communities has begun to draw the attention of social scientists. Portes (1995), for example, states that many immigrants today forge and sustain multi-stranded social relations that link together their societies of origin and settlement. An essential element of "transnationalism" is the multiplicity of involvements that migrants sustain in both home and host societies (ibid.). Such involvements help to transform the home and host locations (e.g. cities) into transnational and global spaces.

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In this special issue of the IJMS, five articles focus on the topic of international knowledge networks established via diasporas. In the first article, Meyer and Wattiaux examine the critiques of DKN, especially regarding their consistency and efficiency. The authors conclude that the DKN phenomenon is both growing and consistent, with many such networks continuing to be active after years of existence. In the second article, Mahroum, Eldridge and Daar focus on public policy, particularly on the question of how governments may benefit from their countries' DKNs. The authors provide several options and draw on some examples from the health-care sector, where the issue of brain drain is most alarming for many poor countries. In the third article, Arocena and Sutz focus on the role of DKNs as extensions to national innovation systems in developing countries. The authors highlight the importance of DKNs as channels for learning and knowledge transfer for local national innovation systems, drawing on examples from Latin America. The fourth article approaches DKNs from a different perspective, particularly from that of the host region in the "North". Berset and Crevoisier focus on the role of immigrants in the transformation of local knowledge production systems and on the various "domestication" and "anchoring" strategies that may be used at the regional and local levels to integrate immigrants' knowledge into the local knowledge systems. Finally, in the fifth article, Feldman takes an ethnographic perspective on the issue of DKNs based on the personal experiences of several highly skilled diaspora members in Sweden. He examines the extent to which members of DKNs draw on their own diaspora networks and resources (e.g. people of similar origins, home countries, etc.) to leverage more resources and advance their professional lives, and how much they manage to extend these resources to other members of their diaspora. He finds that while immigrant knowledge entrepreneurs in the Swedish information and telecommunications market draw less on their co-ethnics for finding skill and talent, they do seek to find international markets by drawing on their diaspora networks.

It is increasingly recognised that diasporas, and diaspora knowledge networks in particular, may contribute to the benefits of the migration process: in receiving countries by providing valuable international linkages that bring new ideas and skills, in migrant source countries by strengthening ties with their emigrants abroad, and last but not least, to the migrants themselves, by giving them a platform for exchange of experiences and valuable contacts for their professional and private lives.

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Diaspora Knowledge Networks: Vanishing Doubts and Increasing Evidence

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Diaspora knowledge networks (DKN) deeply changed the way highly skilled mobility used to be looked at. They conceptually subverted the traditional "brain drain" migration outflow into a "brain gain" of expatriates' skills circulation by converting the loss of human resources into a remote though accessible asset of expanded networks. Doubts and scepticism recently arose due to the novelty of the DKN phenomenon and the lack of historical perspective to assess experience and results. The critiques essentially bear on two aspects: the consistency and the efficiency of the networks. As a new social object and research area, DKN indeed required new tools, methodology and concepts to explore theoretical as well as empirical issues. This paper addresses the critiques by displaying the research process surrounding DKN. Systematically searching through the internet has been a major part of the research exercise, especially during recent years. The evidence definitely proves the ongoing activities of numerous DKN. The consistency of such networks is thus confirmed. Their specific features and their members' identification processes at work with new information and communication technologies are explained.

During the last decade of the twentieth century, groups of highly skilled expatriates originating from developing countries and scattered in the OECD countries emerged and started to make connections among themselves and with their motherlands. These groups and their links definitely correspond to a diaspora scheme – although original – and thus have received different related labels: *intellectual diaspora networks* (Brown 2002); *scientific diasporas* (Barré et al. 2003); *technological and scientific diasporas* (Turner et al. 2003); *scientific, technological and economic diasporas* (Connan 2004); *knowledge networks abroad* (Kuznetsov 2005) and finally, *diaspora knowledge networks* (DKN), recently in a new project run by the International Committee for Social Science Information and Documentation (ICSSD) for UNESCO (Turner 2005).

Diaspora knowledge networks represent a subset of the numerous international knowledge networks that have long existed in the S&T sphere and that have multiplied and expanded in the last twenty years (Crawford et al. 1993; Elzinga and

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Landstrom 1996; Parmar 2002; Stone and Mawell 2004). Apart from their wide diversity, this explains the difficulty in finding a definite substantive. The DKN considered here all share a common objective: to contribute to the development of their members' place of origin, through their skills input. The internet is used for this, although with varying intensity according to the activities of the networks.

Diaspora knowledge networks have deeply changed the way in which highly skilled mobility is looked at. They have conceptually subverted the traditional "brain drain" migration outflow into a "brain gain" skills circulation by converting the loss of human resources into a remote although accessible asset of expanded networks (Meyer et al. 2001). This shifted the traditional emphasis on embedded knowledge of potential returnees in a human capital approach (return option) to a connectionist approach where social capital, including technical and institutional links, is crucial (diaspora option; Meyer 2001). Consequently, in the need for an accurate description of these original associations, sociological observation has initially prevailed upon economic analysis of expected developmental effects.

Doubts and scepticism recently arose due to the novelty of the DKN phenomenon and the lack of historical perspective to assess experience and results. The critiques essentially bear on two aspects: the consistency and the efficiency of the networks. More precisely, their sustainability is severely questioned, as well as their real impact on developments in countries of origin. This challenge to the DKN approach emanates mainly from economic perspectives (Lowell and Gerova 2004 for the former, and Lucas 2004 for the latter). They deserve great consideration as they shed new light on the research object and they stimulate rigorous answers, which is the present purpose. The scientific confrontation of their arguments is best realised through an explicit demonstration of the coherence between the evidence collected, the methods used, the results obtained and the theory developed. Such work has not yet been done in a systematic manner and it is highly useful at this stage, for the development of research tools about transnational networks in general.

As a new social object and research area, DKN indeed requires new tools, methodology and concepts to explore both theoretical and empirical issues. This paper addresses the critiques and shows the research process on DKN. Systematically searching through the internet has been a major part of the research exercise, especially during recent years. Considering the increasing importance of this medium as a source of information for scientific purposes as well as for common knowledge, it is worth describing the rigorous methods used and the robust results produced. Such a detailed description is beyond the present remit and can be found in a special report for UNESCO (Meyer 2006). This paper refers the reader to that study's main findings, through three sections: first, a historical perspective on the evidence for DKN; second, a presentation of the debate that followed the initial "discovery" of such networks and a refutation of some of the critiques born from the elusive character of this new social and research object; third, some of these particular features are highlighted giving indications for policy orientations.

1. Diaspora Knowledge Networks: How Did they Come to Light?

In 1992, the Science, Technology and Development (STD) research team at the French Institut de Recherche pour le Développement (IRD) was in the process of launching a new programme on the international migrations of scientists, when it heard of an original experience from the Colombian community. The Caldas network of scientists and engineers abroad (Red Caldas – Red Colombiana de Cientificos e Ingenieros en el Exterior) had been set up the previous year with the aim of mobilising, gathering and reconnecting expatriates with the mother country and with its brand new national system of science and technology. This initiative represented a unique opportunity to access evidence on a highly skilled expatriate community and to study an original response to the so-called "brain drain". It in fact went far beyond the research team's expectations and became an exploratory study of a burgeoning form of socialisation in the context of globalisation coming up with the regime of a knowledge-intensive socio-economy.

1.1. Empirical studies in the late 1990s

The Caldas network study was led by the STD team along with the Universidad Nacional de Colombia, and from 1998 onwards was followed by SANSA (South African Network of Skills Abroad)[1] in association with the University of Cape Town in South Africa. The research work followed a detailed protocol which seemed appropriate considering the configuration of the object of study and the geographical dispersion of the research team in Austria, Colombia, France, Mexico and the United States (Meyer et al. 1995; Meyer et al. 1997):

- a six-page questionnaire survey of 500 Caldas network members on their professional and associative activities, migrant trajectories and modes of communication;
- dozens of interviews of participants (members abroad, Colombian scientists and policy-makers at home, etc. …);
- participant observations of six "nodes" (local associations of members) in Paris, Washington DC and New York, Mexico City, Paris and Vienna;
- biographical studies (life histories) of a few members, with a deeper analysis of the survey's data;
- statistical and textual analysis of electronic communication through the R-Caldas mailing list.

Four of these five methodological items were conventional instruments in sociological and anthropological field studies familiar to multicultural societies' investigation: survey, interview, participant observation, biographical approach. The fifth was rather new, using software of co-word analysis (*leximappe*) for the

[1] SANSA was set up in 1998 as a research-action project and later delivered as a national asset to the National Research Foundation, which is still running it today.

mapping of meanings and the visualisation of clusters of semantic relations, to highlight socio-cognitive convergences or dispersion within the diaspora (Granes and Meyer 2000).

For both the Colombian and the South African case studies, the tools were thus a mix of traditional and new techniques, although even the former were often used in a new way. The internet was used intensively, for an online questionnaire or for simultaneous coverage of various actors by several researchers in different places at the same time. Survey and participant observations were in this way dissociated from their local and physical support. This definitely multiplied the materials to work with, which fitted perfectly with the decentralised nature of the diasporic objects under study. But it also raised new challenges: control of survey respondents in the anonymous cyberspace or harmonising subjective biases in plural observation contexts, for example. Such challenges were addressed in an adaptive manner, checking the origin of responses through data consistency and neutralising interpretative divergences through continuous communication within the research team, as well as systematic description of the enunciation context, of both actor and researcher, interviewee and interviewer.

Red Caldas and SANSA were isolated case studies that brought a harvest of useful information. However, the scope of such studies remained limited by the empirical dimension of the research work. It was empirical in two ways: the need to gather evidence in order to understand the new phenomenon, and the non-systematic character of this work. The networks had indeed been discovered by random and the research techniques adapted to the circumstances. The results they produced were descriptive of situations at the micro (actors) and meso (networks) levels. However relevant they might be, the explanations given for diasporic processes could not be separated from idiosyncratic roots and particular features. The challenge of generalisation remained. The policy implications of the results obtained would quickly require that this generalisation process occur.

1.2. Scientific results and policy impact

Red Caldas and SANSA proved the feasibility of a diaspora option, i.e. the real existence of off-shore extensive human resources that could be mobilised by the country of origin. Some of the activities in which these contributions have been observed during these case studies, as well as in other instances, are summarised below:

- Exchange of scientific, technical, administrative or political information (contribution to the creation of the new Colombian National S&T system in the early 1990s, by prominent expatriates);
- Specialist knowledge transfer (waste management procedures from the École Polytechnique Fédérale de Lausanne-Switzerland, with the Universidad del Valle, Cali-Colombia);

- "Scientific or technological diplomacy" or promoting the home country in the R&D and business community of the host country (South African medical research in England, Indian IT entrepreneurs in Silicon Valley);
- Joint projects, partly on a virtual basis (distant working, simulations);
- Training: attending home-country sessions and meeting/mentoring students abroad (a feature shared by most networks of this type);
- Enterprise creation (including multinational subsidiaries) to assist the possible return of expatriates on a part-time or permanent basis (Chinese high-tech firms with returnees in science parks);
- *Ad hoc* consultations, for example on research/development projects (peer review, job recruitment, technology assessment).

Each network showed the obvious attractiveness of the diaspora scheme to expatriates. The Colombian network drew over 800 members from 25 countries at its peak and the South African one almost 2,500 from 65. Although this was but a fraction (between 10 per cent and 25 per cent) of the total highly skilled population that had migrated at some stage, the reconnection message sounded appealing to a majority of those actually receiving it.[2] In terms of academic diplomas and socio-professional insertions, they revealed a higher profile than their counterparts within Colombia and South Africa. Clearly, this was less due to the so-called "selective migration" process (migration picking up "the best and the brightest") frequently assumed in an elitist vision, than to superior abilities developed through mobility, a view corresponding to a more constructivist approach. The evidence of surveys and biographical data indeed showed that the highest qualifications acquired by these expatriates, or the skills they exerted as professionals, were linked to their learning trajectories, in educational as well as labour activities, partly and often mainly within the host country (Meyer 2001).

Conceiving the expatriate individual's abilities as a result of migration rather than a reason for it led to a different theoretical framework than under the brain drain paradigm. Skills were obviously built through associations involving many elements of host countries and operational within their own specific contexts. Socio-professional networks enrooted these skills and their carriers in particular settings, groups, institutions, technical systems and organisational procedures through which they made sense and reached productive efficiency. As individuals accumulating constructive associations, the expatriates were themselves heterogeneous networks that the DKN totalised, in a typical actor-network theoretical configuration (Callon 1986).

Contrary to the conventional view and according to statistical information from both research projects, these people showed stability rather than volatility and a

[2] Data produced by both the Caldas and SANSA projects (Brown et al. 2001; Charum and Meyer 1998); on recent estimates of expatriate highly skilled personnel in OECD states per country of origin; see Dumont and Lemaitre (2004).

deep integration into a definite host country instead of a frequent re-emigration pattern.

Interestingly enough, the immersion into the host country community has not contradicted a renewed identification with the country of origin through the DKN. The call for participation by both the Caldas and the SANSA networks has often caught people who had cut off collective links with Colombia and South Africa, respectively. The networks' knowledge and development projects brought them back into the national sphere. Their identification is therefore more proactive, turned to the future, than retrospective and based on memory. They may move equally in two universes, like amphibians, but they respect this double allegiance and do not erase borders, at equidistance between *communautarism* (maintenance of separate communities) and cultural alienation. Across frontiers, they weave professional and associative ties but they keep the reference to the common origin as a pivotal centre. These features distinguish the DKN from purely transnational communities (Vertovec 1999; Portes 1999) and bring them closer to the diaspora criteria (Cohen 1997) even though their scope is limited to professional, knowledge-based activities.

The Colombian and South African networks have had an erratic life for their respective fifteen and eight years, and they both recently went through a type of evaluation process (Chaparro et al. 2004; NRF 2005). The reports point to various difficulties but also to the persistence of their activities. In the late 1990s, within the context of great pressure on highly qualified resources worldwide, DKN such as these appeared as a very promising solution, a potentially win-win situation for knowledge-intensive as well as developing economies. The search for other examples then became crucial in order to assess the extent of the initiatives, to compare their conditions of realisation and to appraise the possibilities of using them or of creating new ones. This search required an important methodological investment that deserves to be described, for it is a step along the way in which sociological knowledge may be drawn from new sources about transnational communities, beyond a definite contribution to a scientific description of DKN.

2. Systematic Enquiry: Surfing and Fishing in High Waters

Four censuses of highly skilled diaspora networks have been made in the attempt to grasp the magnitude of the phenomenon, beyond isolated case studies.

- 41 expatriate networks of "developed" and "developing" countries were identified on the occasion of the June 1999 UNESCO World Science Conference (Meyer and Brown 1999);
- 106 networks referring exclusively to developing countries, in a 2002 state of the art analysis of scientific diasporas by a panel of international experts, published in September 2003 (Barré et al. 2003),

- 61 expatriate networks of "developed" and "developing" countries, in a report prepared for the World Bank (Lowell and Gerova 2004) in September 2004;[3]
- finally, 158 networks referring exclusively to developing countries, in 2005, with results presented in this paper, Section 3 and Appendix 1.

As Caldas, SANSA and a few other case studies had shown, the internet was a major if not the only "universal" medium through which such networks could become visible to the general public. There was no other common space to be explored and the search naturally turned to this one, quickly showing the limits of traditional search engines and techniques, even when exploited in a systematic manner. Societal links had to be added to automatic search in a socio-technic combination, to significantly increase the productivity of the exploration.

2.1. The limits of cruising in cyberspace with search engines[4]

Today, there are about 10 billion internet pages. Finding relevant network websites among such floods of information is like navigating in an ocean to discover new islands, without much indication of proximity and localisation.

For the initial systematic search, in 1999, the exploration relied upon repeated queries with a number of keywords deduced from the case studies (Caldas and SANSA) that had given some clues. Such terms as "expatriate", "knowledge", "abroad" and so on were then used extensively and applied to various country names. After weeks of enquiries with pre-Google search engines, the harvest of forty-one networks was collected. Although this result materialised a number of intuitions that the isolated case studies had provided before, the "natural" method used so far also showed its limits. The analysis indeed pointed at two specific difficulties: the tremendously diverse vocabulary of network names and the technical limits and biases of the search engines.

2.2. A method based on socio-technical assumptions

How to find these websites that are not to be found by querying web search engines individually? The answer lay in defining an alternative strategy that does rely primarily on human competence and knowledge, instead of search engines. Four techniques/methods were used:

(1) To surf the Web in an alternating movement, visiting diasporic association websites, from which were found "links" web pages, where new diasporic association website addresses were discovered, and so on.

[3] A new and as yet unpublished report by the same authors expands these findings to 97 "e-diaspora" organisations.

[4] A full description of the methods used is provided in Meyer (2006, Appendix 1).

(2) Having exhausted the links, websites that were cited in the literature, or given by the expert panel of the 2002–2003 state of the art, were explored.

(3) Google or Copernic queries with a combination of specific keywords, which were selected not so much with the aim of finding many networks but for picking up at least one diasporic association. For example, such keywords as "physician", "association", "*host country*", "*origin country*" could bring up the name of the association of physicians from a given origin and working in a given country – as it appeared that physicians were more likely than other professionals to constitute diasporic professional associations.

(4) Some Usenet forums named after the scheme "*country*.soc.culture" are a classic meeting point for expatriates trying to speak with compatriots, and the relation of the diaspora with the origin country are commonly a matter of discussion. Google offers the archives of these forums, where a few website addresses have been discovered, which by any other means would have remained unknown.

In other words, sociological assumptions were made and effective links used (professional corporations, ethnic communities and the like) to serve as structural axes in a heuristic process. In an incremental manner, as the list of websites discovered expanded and the vocabulary enriched, and while geographical holes appeared more clearly, the focus of the search improved and each exploration became more efficient, especially for the 2005 enquiries, the results of which are presented in the next section.

As a conclusion to this methodology of tracking transnational networks through the internet, the mix of automatic information tools and human knowledge should be emphasised. Previous generation search engines were very effective in daily use allowing us to dig into an enormous amount of documentation with tremendous speed. But however sensitive they may be for general enquiries, when turning to specific targets they need to be fed, oriented, guided and completed by expert knowledge. For DKN studies, such a particular mix of human and technical mediations provides abundant evidence and gives very precise answers to doubts and critiques about the existence and stability of this new research object.

3. Facing the Critiques

As soon as they appeared, the diaspora knowledge networks raised as many doubts and critiques as they did enthusiastic expectations. As new social objects with potential economic – among other – advantages, they still are unfamiliar epistemic entities whose substantial reality and power would apparently need to be firmly established. At the moment, the scepticism and critiques essentially focus on two aspects: the consistency and the efficiency of the networks. This section mainly

addresses the former and leaves the latter for an economic set of arguments to be developed elsewhere. However, it is worth mentioning briefly here before going on to answer the consistency questions.

The second type of criticism relates to the effectiveness of these networks on the development front. Some analysts have found that the countries with more active diaspora knowledge networks are precisely those in the "emerging economies" category, many of them located in Asia and enjoying an incomparably better academic and industrial environment than most developing countries. As an illustration of this, expansion in the Indian computer industry is often attributed to the crucial input provided by associations of Indians working in Silicon Valley (see for example Saxenian et al. 2002), yet this factor would appear to count for less than the presence of local labour that is cheap and highly skilled (Lucas 2004). Hence some fundamental questions about the direct or indirect link between expatriate initiatives and local development. While a direct link does seem hard to establish – as it is in general for any knowledge input (educational or R&D) into the economy – there are some striking coincidences that bear it out. Diasporas help, at the very least, to create positive externalities that can be used by their networks to boost markets, which become more buoyant (Meyer 2005). The evidence on the impact should thus be conceived and analysed in a larger socio-economic framework than a limited cause and effect relationship.

3.1. Doubts on DKN consistency

In a recent report to the World Bank, Lindsay Lowell and Stefka Gerova called into question the findings of the analysis on the occasion of the 1999 UNESCO World Science Conference referred to in Section 2.

> (Our work) … updates Meyer and Brown's (1999) list of 41 web-based diaspora networks and adds 20 additional organizations, as well as assesses the level of activity and involvement that a particular organization or network maintains. … As [it] shows, since 1999, only 5 new networks – 9 if counting the ones established in 1999 – have been established, which does not suggest a proliferation of expatriate organizations and communities. And of those networks listed, 20 percent (12 out of the 61) do not have a website, suggesting a high rate of underutilization of available technology. In addition, many diaspora organizations are formed sporadically or on an ad-hoc basis. The inactivity rate in our sample is 34 percent (21 out of 61), defined either as lack of a website or any online information about the network, or as a website not updated in the past two years. Only 44 percent (27 out of 61) of the networks we examined are updated regularly, while just 56 percent (34 out of 61) have been updated recently within the last year (Lowell and Gerova 2004: 23).

In order to address systematically each of these statements they can be summarised successively:

- there is no DKN proliferation, with such a moderate number and slow increase;

- the internet is underutilised and does not represent a major factor of DKN expansion;
- activity is highly questionable as many networks seem dormant or no longer alive.

These observations lead the authors to the following conclusion:

> The way in which these samples have been collected should give most researchers pause in strongly touting them as evidence of success, although it should be admitted that neither is such a sample conclusive evidence of a lack of success. Nevertheless, it appears that very few diaspora networks remain stable and manage to serve the needs of their membership or the home country for long periods of time. However reasonable it may be for optimism when evidence for diaspora networks is confirmed, especially as it corroborates loosely framed expectations about transnational activities, the evidence on their activity does not inspire the same confidence as to their effectiveness or impact (Lowell and Gerova 2004: 24).

The question of measured impact and effectiveness are not dealt with here, as explained in the introduction to this section. On the other hand, the existence of numerous networks as well as their visible ongoing activity are very specifically proven below. Without any doubt, the evidence brought by the Lowell–Gerova report was too weak to cover the real dimensions of the phenomenon.

3.2. Overwhelming evidence on the current existence and activity of DKN

Through the various methods presented in Section 2, the evidence for DKN has been gradually constituted in three successive steps: in 1999, 2002 and 2005. The results are displayed in Appendix 1, listing all the diaspora knowledge networks whose activity is confirmed as of 1 June 2005. Synthesising these results in addressing the issues raised in the World Bank study discussed above can be done on the same axes: network census figures, current activity, internet visibility and use.

3.2.1. A high number of networks and always increasing

The Lowell–Gerova report of September 2004 works on figures from the 1999 first census (Meyer and Brown 1999) and ignores those produced in 2002, published and widely disseminated in 2003 (Barré et al. 2003). In the latter, the number passed from 41 identified networks referring to all kinds of countries of origin – "developed" as well as "developing" – to 106 exclusively selected for their link with and orientation to development of so-called Third World countries. This increase was due to the systematic search techniques used and presented in Section 2. The results were made available as an appendix to the state of the art on scientific diasporas with URLs available for further enquiry (Barré et al. 2003). A new effort in 2005 increased the number to 158 identified DKN. If the Lowell–Gerova search figures are added to these – omitting the few duplicated networks –

the total of identified DKN amounts to 173 and concerns forty different developing nations plus four specific regional groupings. The fact that few duplications occurred among several enquiries, made at different times by different teams, with different techniques, as well as the ever-increasing list, increases the likelihood of finding even more networks in the future. Considering that some areas with high diasporic potential have so far remained rather in the shadow (Caribbean, Middle East) it would not be surprising that an exhaustive list of DKN would be over 300 and cover a majority of non-OECD countries. This evaluation is confirmed by recent figures from Asia (Meyer 2006).

3.2.2. A fragile though durable activity

The last census exercise, in 2005, checked the activity of every network. This was done by systematically collecting traces of very recent events (under one month) or, in the absence of such a trace, calling the coordinators, administrators or webmasters. In cases where no sign at all was emitted by the DKN and received by the research team, the network was not included in the confirmed active list. The result thus leaves no room for doubt: at least 101 of the 158 networks are definitely active today, representing almost two-thirds of the total (see Appendix 1). Their lifespan varies considerably from one network to another but is roughly ten years on average, judging by their reported history. Some are old associations that decided to go on air (set up a website) and others are just pure and fresh emanations from the internet.

More than half of DKN identified in 1999 (and relevant in the following lists) are still active today even if and when they reported difficulties (see Section 1.1 on the evaluation processes of Caldas and SANSA). These percentages are not far from those of the Lowell–Gerova study but the interpretation naturally differs considering the modest size of their sample, compared to the one here. There is no slow erosion of a small stock of DKN, but rather a lively forest of sometimes precarious, sometimes durable, organisms. In any case, this normal mortality rate should be considered in the light of the corresponding high-tech background. For example, in the United States, on average, three out of five new business start-ups fail within their first five years. No one would, however, infer from this figure that investing in technological innovation is a mistake … Nonetheless, the question of the viability of the networks should certainly be examined through comparative analysis of failures and success stories, in order to understand their conditions of realisation. The list in Appendix 1 offers a large sample for such sociological and historical enquiries.

3.2.3. A definite reliance on the internet

As explained in Section 2, all 158 identified DKN have an internet window, as their existence has been essentially pinpointed through this medium. Even the 15 Lowell–Gerova items counted in the total of 173 networks mentioned above (see

Section 3.2.1) are all internet-based. There is no more convincing proof of this medium's importance. For some of these networks (12 of them, classified "type A" in Appendix 1) their very existence is on the internet, as they are pools of human resources mainly linked by the website artefact. The more general networks (38, classified "type B" in Appendix 1) are large associations for which only a part of their activities are explicitly turned towards knowledge and development issues with the country of origin. The specialised networks (48, classified "type C" in Appendix 1) focus on such actions, often in a very similar fashion to the Caldas or SANSA networks.

During the 2003 state-of-the-art analysis of scientific diasporas, a few networks with limited scope were found with a purpose definitely corresponding to the DKN characteristics included in Appendix 1 (origin a developing country, explicit development goals, highly skilled members, knowledge transfer and circulation) but without any website address or visible internet presence (Barré et al. 2003). The experts pointing them out happened to know about their existence by other means (personal knowledge, familiarity with specific diasporas). This tends to reinforce the hypothesis that a number of additional networks may still be found and that the list provided so far is not exhaustive.

There is a converging set of comments on use of the internet by the DKN at this stage, emphasising the fact that their use of information and communications technology has so far been limited compared with their potential in terms of interactive and effective distributed collective practice (Teferra 2003; Turner et al. 2003; Chaparro et al. 2004). Therefore, the DKN ICSSD/UNESCO project aiming at new developments in this area opens a field of useful insights and perspectives (Turner 2005).

4. Perspectives

Evidence, when gathered in a systematic manner through the internet, convincingly shows that there is a high and increasing number of diaspora knowledge networks. It also proves that a majority of them are still alive after some years of operation. This result gives a clear indication for policy as well as for further research.

DKN are substantial, consistent, initiatives of international cooperation, which states and intergovernmental agencies, as well as NGOs, may now consider seriously, beyond initial doubts about their existence and stability.

The content of the activities developed by these numerous networks is beyond the scope of this paper. A wide field of investigation thus remains open, as the few case studies so far have only scratched the surface of a deep and diverse sample. It is time to expand our knowledge about the conditions, representations, socialisation processes, modes of organisation and developmental impacts that DKN have (or not) through these activities. Recent Asian case studies do provide positive evidence on these aspects (Meyer 2006)

The findings presented do not prejudge the long-term viability of the networks and the intensity of their activities. But they do confirm their potential and provide precise materials to work on, both for cooperation as well as for research projects.

By way of conclusion, it is important to return to the individuals constituting these networks and to the potential development they represent. Case studies, especially on Africa, show that these highly skilled professionals identify themselves to their home country, much less because of the past than for the future and less because of an abstract memory than for specific development purposes. They feel that their higher cognitive, technical and social capacities may collectively be made available to their country and the expatriation situation exacerbates such feelings. Motivated by a contribution to the future through knowledge activities, these expatriates forge a diasporic identity in a projective rather than retrospective manner. Their common origin becomes more metaphorical than geographical, as can be seen with some networks whose members refer to the regional/cultural proximities cutting across national borders. African networks, for example, often exhibit a neo-pan-African approach, less ideologically or institutionally oriented than during decolonisation times and based rather on technical and pragmatic perspectives.

The diaspora must therefore not be perceived as a reaction to *communautarism* but rather as a creation of identity on a larger, inclusive, base. As a Latin American scientist in New York stated: "in Manhattan, as a Colombian expatriate researcher and member of the Colombian Caldas network, we used to organise AIDS prevention campaigns in Spanish for all the *latinos* in the area." The linguistic community associated with the expatriate situation constitutes an opportunity for an identity expansion, in construction around a common project of contribution to the development of the place of origin and its population. This energy may appropriately be used by traditional nation-states for their own development as well as for their soft and progressive replacement by cosmopolitan citizenship (Beck 2006). This is where governance – facilitation of civil society initiatives – makes great sense: expatriate associations of scientists' and engineers' contributions can definitely be enhanced by public support and promotion.

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Appendix 1

155 networks identified at 15 March 2005

Activity: N – inactive; R – return after test; Y – active; blank – no return
Type: A – pool of human resources; B – generalised network; C – specialised network
Year of identification: 1 – 2000; 2 – 2002; 3 – 2005

Geographical Zone / Country (37 countries + 4 areas)	Name of Network	Website Address	Activity	Type	Origin
AFRICA (51)					
Africa (5)	International Society of African Scientists (ISAS)	http://www.dca.net/isas/	R	B	2
Africa	African Community International (The African Center)	http://www.africancommunity.net/	Y	B	2
Africa	International African Students Association (IASA)	http://www.iasaonline.org/		B	2
Africa	African Distance Learning Association	http://www.physics.ncat.edu/~michael/adla/	Y	A	2
Africa	Africa in the Netherlands	http://www.africaserver.nl/africadirectory/		A	3
Algeria (2)	Association Internationale des Chercheurs Algériens AICA	http://www.mygale.org/09/aica	N	C	2
Algeria	Association pour le Développement des Sciences Biologiques fondamentales et appliquées, en faveur de l'Algérie	http://www.algebio.org/		C	2
Cameroon (1)	Cameroon Society of Engineers (CSE), USA	http://www1.stpt.usf.edu/njoh/cse/cseusa.htm	R	C	2
Ethiopia (12)	Federation Ethiopian Organizations for the Spread of Knowledge (FEOSK)	http://www.physics.ncat.edu/~michael/vses/genet/ees/	Y	B	2
Ethiopia	Society of Ethiopians Established in the Diaspora	http://www.ethioseed.org/	Y	B	2
Ethiopia	Ethiopian Professionals Association Network (EPAN)	http://www.ethiotrans.com/epan/	Y	C	2
Ethiopia	Ethiopian Professors	http://www.angelfire.com/de/Ethiopian Professors/index.html	Y	A	3
Ethiopia	Ethiopian Students Association International	http://www.esai.org/	Y	B	2
Ethiopia	Ethiopian Distance Learning Association	http://www.physics.ncat.edu/~michael/edla/	Y	A	2
Ethiopia	Ethiopian Chemical Society in North America	http://ourworld.cs.com/ecsna1/index.htm?f=fs		C	3
Ethiopia	Ethiopian North American Health Professionals Association	http://www.enahpa.org/	Y	C	2
Ethiopia	Addis Ababa University Alumni Association	http://www.aau.edu.et/alumni/president.php	Y	B	3
Ethiopia	Ethiopian Economic Policy Research Institute (EEA/EEPRI)	http://www.eeaecon.org/news.htm		C	2
Ethiopia	Ethiopian Scientific Society (ESS)	http://www.his.com/~ess/	???		2
Ethiopia	Gesellschaft zur Förderung der Medizin, Ingenieur und Naturwissenschaften in Äthiopien	http://www.emenssg.de/	???		2
Kenya (1)	Kenyan Community Abroad (KCA)	http://www.kenyansabroad.org/	Y	B	2
Mali (2)	Malinet, the Malian World Network	http://callisto.si.usherb.ca/~malinet/	R	B	2
Mali	MaliLink Discussion Forum	http://www.malilink.net/	Y	B	2
Morocco (12)	Moroccan Association of Researchers and Scholars Abroad (MARS)	http://www.ee.pdx.edu/~nadir/mars1.html	N	C	1

Morocco	Initiativgruppe Marokkanischer Ingenieur-Studenten für RegenerativeEnergien	http://www.imir.org/	R	C	2
Morocco	Savoirs et développement	http://www.savdev.org/asso.php		C	3
Morocco	Moroccan American Business Council	http://www.usa-morocco.org/	Y	B	2
Morocco	L'Association des Biologistes Marocains	http://www.biomatec.org/		C	2
Morocco	Association des Biologistes Marocains en Belgique	http://alize.ulb.ac.be/biomatec/		C	2
Morocco	MABIOL Forum des Biologistes Marocains dans le Monde	http://www.epita.fr:8000/~mabiol/		C	2
Morocco	Regroupement des Biologistes Marocains au Canada (RBMC)	http://www.rbmc.qc.ca/	Y	C	2
Morocco	Association des Physiciens Marocains en Belgique	http://www.ulg.ac.be/phymabel/	Y	C	2
Morocco	VereinmarokkanischerStudierenderund Absolventen in Bochum e.V.	http://www.ruhr-uni-bochum.de/vmsa/	Y	B	2
Morocco	Groupe Interdisciplinaire de Recherche sur l'Éducation au Maroc (GIREM)	http://www.fse.ulaval.ca/fac/href/girem/index.html	R		2
Morocco	Association Scientifique Marocaine (ASMA)	http://web.archive.org/web/19980214082939/ http://www.ift.ulaval.ca/~asma-net/Menu_principal.html	R		2
Nigeria (5)	Association of Nigerians Abroad	http://www.ananet.org/	Y	C	1
Nigeria	Nigerian American Public Service Professionals Association	http://www.nappas.org/	Y	C	2
Nigeria	Nigerian Business Forum (NBF)	http://www.nbfonline.org/	Y	B	2
Nigeria	Igbo Cultural and Support Network	http://www.igbocsn.com/	Y	B	2
Nigeria	Association of Nigerian Physicians in the Americas (ANPA)	http://www.anpa.org/	Y	C	2
South Africa (1)	South African Network of Skills Abroad (SANSA)	http://sansa.nrf.ac.za/	Y		1
Sudan (1)	Sudan-American Foundation for Education, Inc.	http://www.sudan.com/safe/	Y		2
Tunisia (8)	Tunisian Scientific Consortium		R	C	1
Tunisia	Association des Tunisiens des Grandes Écoles (ATUGE)	http://www.atuge.org/	Y	B	2
Tunisia	Association des Chercheurs Enseignants Tunisiens de France (ACETEF)				2
Tunisia	Cercle de Recherche Interdisciplinaire Tunisien de Toulouse (CRITT)	http://www.chez.com/lecritt/	R		2
Tunisia	Rassemblement des Étudiants Tunisiens de Nice (RETUN)	mailto:jaidane@caramail.com			2
Tunisia	Tunesische Wissenschaftliche Gesellschaft	http://www.uni-karlsruhe.de/~twg/	Y		2
Tunisia	Tunesische Akademiker Gesellschaft	http://www.thinktank.de/news/index.htm	Y		2
Tunisia	Association Scientifique Tunisienne à l'Université Laval (ASTUL)	http://www.ulaval.ca/astul/			2
Togo (1)	Communauté Togolaise au Canada (CTC)	http://www.diastode.org/ctc/index.html	Y	B	2
ASIA (80)					
Asia (2)	Asian American Manufacturers Association (AAMA)	http://www.aamasv.com/	Y	B	2
Asia	Asia-Silicon Valley Connection (ASVC)	http://www.asvc.org/	Y	C	2
ASIA Middle East (10)					
Arab States (5)	Network of Arab Scientists and Technologists Abroad	http://www.asta-net.org/asta.html	M	C	1

Arab States	Islamic Medical Association of North America	http://www.imana.org/	Y	C	2
Arab States	National Arab American Medical Association (NAAMA)	http://www.naama.com/	Y	C	2
Arab States	Association of Muslim Scientists and Engineers (AMSE)	http://www.amse.net/	Y	C	2
Arab States	Union Arabischer Mediziner in Europa e.V. (Arabmed)	http://www.arabmed.de/	Y	C	2
Iran, Islamic Rep. of (1)	Iranian American Medical Association	http://www.iama.org/index1.php	Y	C	2
Iraq (1)	International Society of Iraqi Scientists	http://www.issiraq.org/Default.asp	Y	C	2
Lebanon (1)	American Lebanese Medical Association	http://www.almamater.org/index.htm	Y	C	2
Palestinian AT (1)	Palestinian Scientists and Technologists Abroad (PALESTA)	http://www.palesta.net		C	1
Turkey (1)	Society of Turkish American Architects, Engineers and Scientists, Inc. (MIM)	http://m-i-m.org/	Y	C	2
ASIA South (40)					
Bangladesh (11)	EB2000: Expatriate Bangladeshi 2000	http://www.eb2000.org/	Y	C	2
Bangladesh	TechBangla for transferring to and developing indigenous technology and products in Bangladesh	http://www.techbangla.org/	R	C	2
Bangladesh	Bangladesh Environment Network	http://www.ben-center.org/	Y	C	2
Bangladesh	Bangladesh Medical Association, North America	http://www.bmana.com/	Y	C	2
Bangladesh	American Association of Bangladeshi Engineers and Architects, NY-NJ-CT, Inc. (AABEA Tristate, Inc.)				2
Bangladesh	Bangladeshi-American Foundation, Inc. (BAFI)	http://www.bafi.org/	Y	B	2
Bangladesh	Association for Economic and Development Studies on Bangladesh (AEDSB)	http://www.aedsb.org/index.htm	Y	C	2
Bangladesh	Alochona	http://www.alochona.org/	Y	B	2
Bangladesh	North American Bangladeshi Islamic Community (NABIC)	http://www.nabic.org/	Y	B	2
Bangladesh	North America Bangladesh Statistics Association	mailto:mali@gw.bsu.edu			2
Bangladesh	Bangladesh Chemical and Biological Society of North America (BCBSNA)	mailto:kamal.das@netl.doe.gov			2
India (16)	India Network Foundation	http://www.indnet.org/	Y	B	1
India	Silicon Valley Indian Professionals	http://www.sipa.org/	Y	C	1
India	Worldwide Indian Network	http://theory.stanford.edu/people/arjun/WIN.html	R		2
India	GOPIO Global Organisation of People of Indian Origin	http://www.gopio.net/	Y	B	3
India	International Association of Scientists and Engineers and Technologists of Bharatiya Origin				1
India	Interface for Non-Resident Indian Scientists and Technologists Programme (INRIST)	http://sunsite.sut.ac.jp/asia/india/jitnet/csir/tokten.html			1
India	The Indus Entrepreneurs (TiE)	http://www.tie.org/	Y	B	2
India	Indian CEO High Tech Council (ICEO)	http://www.indianceo.com/			2
India	Network of Indian Professionals	http://www.netip.org/	Y	B	2
India	American Association of Physicians of Indian Origin (AAPI)	http://www.aapiusa.org/	Y	B	3

India	Association of Kerala Medical Graduates	http://www.akmg.org/	Y	C	3			
India	Society of Indian Scientists Abroad (SISAB)	http://www.sisab.net/default.asp	Y	C	2			
India	Japan-India Technology Network (JITNET)	http://sunsite.sut.ac.jp/asia/india/jitnet/	Y	A	2			
India	Enterprising Pharmaceutical Professionals from the Indian subContinent	http://www.eppicglobal.org/	Y	C	3			
India	National Federation of Indian-American Associations	http://www.nfia.net/	Y	B	3			
India	Indian Professionals Network	http://www.ipnatlanta.net/ipn/	Y	A	3			
Nepal (8)	Network of Nepalese Professionals	http://www.netnp.org/index.html			2			
Nepal	Association of Nepalis in America	http://www.anaonline.org/index.php	Y	B	2			
Nepal	Nepalese Entrepreneurs Group (NEG)	not yet			2			
Nepal	Nepal United States Educational Network	http://nusf.homestead.com/			2			
Nepal	America Nepal Medical Foundation	http://www.anmf.net/	Y	C	2			
Nepal	Empower Nepal Foundation	http://empowernepal.hypermart.net/			2			
Nepal	Sajha Career Network	http://www.sajha.com/sajha/html/network.cfm	Y	A	3			
Nepal	Society of Ex-Budhanilkantha Students	http://sebsonline.org/	Y	B	2			
Pakistan (4)	Return of Qualified Expatriate Nationals to Pakistan	http://www.rpi.edu/dept/union/paksa/www/html/pakistan/TOKTEN/html			1			
Pakistan	Association of Pakistani Physicians of North America (APPNA)	http://www.appna.org/	Y	B	2			
Pakistan	Association of Pakistani Scientists and Engineers of North America	http://www.apsena.org/		C	2			
Pakistan		http://www.apcep.org/			2			
Sri Lanka (1)	Lanka Academic Network (LAcNet)	http://www.lacnet.org/lacnet/	Y	B	2			
ASIA Central (1)								
Armenia (1)	Armenian Volunteer Corps	http://www.armenianvolunteer.org/	Y	A	2			
ASIA South East (14)								
Lao PDR (2)	United Laotian Americans (ULA)	http://www.theula.org/main.html	Y	B	2			
Lao PDR	Association de Soutien au Lycée de Vientiane	http://aslvte.online.fr/	Y	B	2			
Malaysia (1)	Malaysian Scientist Abroad Search	http://www.mastic.gov.my/masticlink/stm/setdlm.asp	Y	A	2			
Philippines (4)	Brain Gain Network	http://www.bgn.org/		C	1			
Philippines	Society of Filipino-American Young Professionals (SFAYP)	????????			2			
Philippines	Society of Philippine Surgeons in America	????????	Y		2			
Philippines	Association of Philippine Physicians in America	http://www.aboutappa.org/index.html		C	3			
Thailand (5)	Association of Thai Professionals in America and Canada	http://www.atpac.org/	Y	C	1			
Thailand	Association of Thai Professionals in Europe	No website			1			
Thailand	Association of Thai Professionals in Japan	http://owl.fedu.uec.ac.jp/ATPIJ/	Y		1			
Thailand	Reverse Brain Drain Project – Thailand	http://rbd.nstda.or.th/		C	1			

Thailand	Thai Physicians Association of America	http://www.geocities.com/tpaa1/index.html			2
Viet Nam (2)	Vietnamese Professionals Society (VPS)	http://www.vps.org/sommaire_en.php3	Y	C	2
Viet Nam	Association Odontologique France VietNam	http://www.aofv.org/		B	2
ASIA East (15)			Y		
China (9)	Society of Chinese Bio-scientists in America	http://www.scba-society.org/	Y	C	1
China	Chinese Scholars Abroad	http://chisa.edu.cn/		C	1
China	American Association of Chinese Physicians	http://ourworld.compuserve.com/homepages/aacp/	Y		2
China	Oriented (online network for Taiwan's global community)	http://oriented.org/	Y	A	2
China	Overseas China Physics Association	http://www.ocpaweb.org/ocpa/	Y	B	2
China	Chinese Association for Science and Technology, USA	http://www.castusa.org/	Y	C	3
China	Association of Chinese Scientists and Engineers	http://www.acse.org/index.php	Y	C	3
China	Association of Chinese Professors of Social Sciences in the United States	http://www.kennesaw.edu/acpss/; http://www.sicet.org/	Y	C	3
China	Chinese Economists Society	http://www.china-ces.org/		C	3
Rep. Korea (6)	Global Network of Korean Scientists and Engineers	http://www.kosen21.org/english/kos11.html	Y Y	C	1
Rep. Korea	Korean-American Scientists and Engineers Association (KSEA) (ex-Korean Scientists Engineers Association of Sacramento Valley)	https://www.ksea.org/	Y	C	1
Rep. Korea	Society of Korean-American Scholars (SKAS)	http://www.skas.org/	Y	C	3
Rep. Korea	Association of Korean Physicists in America (AKPA)	http://www.akpa.org/		A	3
Rep. Korea	International Association of Korean Lawyers (IAKL)	???			2
Rep. Korea	International Network of Korean Entrepreneurs (INKE)	http://www.inke.org/			2
LATIN AMERICA & CARIBBEAN (24)				Y	
Latin America (4)	Asociation Lattino-americaine de Scientifiques (Latin American Association of Scientists) – ALAS	http://www.unesco.org/	Y	A	1
Latin America	Consejo Latinoamericano De Biomedicina Experimental Network CLABENET	http://169.237.95.4/clabenet.html		B	2
Latin America	Sociedad de Biofísicos Latinoamericanos (SOBLA)	????	Y		2
Latin America	Interamerican College of Physicians and Surgeons (ICPS)	http://www.icps.org/intro.html		B	3
CENTRAL AMERICA & CARIBBEAN (4)				Y	
Cuba (1)	Medical Education Cooperation with Cuba	http://www.medicc.org/		C	2
El Salvador (2)	Conectandonos al Futuro de El Salvador (Connecting to El Salvador's Future)	http://www.conectando.org.sv/			1
El Salvador	Salvadoran American Medical Society	http://www.samsdoctors.com/			2
Haiti (1)	Association of Haitian Physicians Abroad (AMHE)	http://www.amhe.org/	Y	C	2
SOUTH AMERICA (16)					
Argentina (7)	Asociación Argentino-Norteamericana para el Avance de la Ciencia, la Tecnología y la Cultura	http://www.anacitec.org/	R		2

Argentina	Profesionales Argentinos en el Exterior (PROAR)	http://www.anacitec.org/proar/index.html	Y		2	
Argentina	Asociación de Profesionales Argentinos en el Reino Unido (APARU)	http://www.aparu.org.uk/index.php	Y	C	3	
Argentina	Argentinos en Red (AER)	http://argentinosenred.org.ar/modules/news/	Y	B	3	
Argentina	Red de Estudiantes y Graduados Argentinos en Estados Unidos	http://www.red-argentina.net/red-argentina.htm	Y	B	2	
Argentina	Alumni Foundation de Argentina	http://www.fundacionalfa.com.ar/	Y	B	2	
Argentina	Raices (Red de Argentinos Investigadores y Científicos en el Exterior)	http://www.raices.secyt.gov.ar/	Y	C	3	
Colombia (4)	Profesionales y Estudiantes Colombianos en el Exterior	http://pecx.com/index.pl		B	1	
Colombia	Colombian Network of Researchers Abroad – Brazilian node	http://www.mat.unb.br/~ayala/nodobrasil.html			1	
Colombia	Colombian Network of Researchers Abroad – Italian node	http://www.pg.infn.it/redcaldas/	Y		1	
Colombia	Red Caldas (Red Colombiana de Científicos e Ingenieros en el Exterior)	http://www.colciencias.gov.co/redcaldas/index.php	Y	C	3	
Peru (2)	Red Científica Peruana (Peruvian Scientific Network)	http://www.rcp.net.pe/peru/peru_ingles.html		B	1	
Peru	Peruvian American Medical Society (PAMS)	http://members.aol.com/PAMS1996/	Y		2	
Uruguay (1)	Red Academica Uruguaya (Uruguayan Academic Network)	http://www.rau.edu.uy/		B	1	
Venezuela (2)	El Programa Talento Venezolano en el Exterior (Program of Venezuelan Talents Abroad – TALVEN)	http://www.embavenez-paris.com/divers/talven.htm			1	
Venezuela	Venezuelan American Medical Association	http://www.vama.org/				

Transnational Diaspora Options: How Developing Countries Could Benefit from their Emigrant Populations*

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Historically, the emigration of knowledge workers has been viewed as a loss for the source countries and a net gain for the receiving countries. Inadequate responses have included restrictive contracts and attempts at repatriation. However, the reasons why highly skilled knowledge workers emigrate are complex and vary between source countries. Health-care workers exemplify this: they have become part of an increasingly globalised labour market and of an expanding transnational health service system of providers, services, financial services and patients. In this paper we focus on how source countries might benefit from their diaspora by turning "brain drain" into "brain gain". We explore various models and suggest some policy options that source countries may wish to adopt. We also examine various leadership models for action by communities, governments and international organisations.

The term "diaspora"[1] (Greek for scattering or sowing of seeds) is used (without capitalisation) to refer to any people or ethnic population forced or induced to leave their traditional ethnic homelands, being dispersed throughout other parts of the world, and the ensuing developments in their dispersal and culture. The academic field of diaspora studies was established in the late twentieth century with regard to the expanded meaning of diaspora. For example, the African diaspora comprises the movements and culture of Africans taken into slavery and their descendants throughout the world, whereas the Irish diaspora includes the millions of Irish refugees from Ireland due to the Potato Famine and political oppression.[2] There are also many other examples such as the French Canadian diaspora,[3] the South-East Asian diaspora and the Jewish diaspora. Also, in modern

[1] This definition is from wordiQ.com (http://www.wordiq.com/definition/Diaspora).
[2] The term first came widely into use in Ireland in the 1990s when the then president, Mary Robinson, began using it to describe all those of Irish descent.
[3] Includes hundreds of thousands of people who left Quebec for greener pastures in the United States, Ontario and the prairies between 1840 and the 1930s.

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Greek the word *diaspora* refers to the large populations of Greek descent living in Australia, the United States and other countries.[4]

Yet more recently, the term "diaspora knowledge networks" has begun to circulate among social scientists to refer to the large numbers of skilled personnel who migrate every year from their home countries to join thousands and millions of their countrymen and women residing in countries other than their own. An important proportion of this new diaspora are health-care workers, particularly nurses and physicians. Both groups of professionals are considered highly skilled knowledge workers because their training requires at least graduate degree level. The reasons why highly skilled knowledge workers such as health workers emigrate are complex and vary between source countries. Historically, such emigration has been viewed as a loss for the source countries and a net gain for the receiving countries. Responses in the past have included restrictive contracts and attempts at repatriation. These and other approaches have not stemmed the flow or reversed it. An important question is that if people cannot be stopped from emigrating and if, as seems to be the case, they cannot be forced back to their countries of origin, how else can source countries try to benefit from their diaspora? This is a particularly challenging question with regard to heath-care workers whose services are indispensable for any society, but most particularly so for developing countries.

This paper explores some options, identifies relevant examples and suggests some policy options that source countries may wish to adopt to derive benefit from this increasingly important resource. Although the paper focuses primarily on health-care professionals, the options and experiences highlighted do not always stem from that sector. This is deliberate, as we believe that the migration of health-care workers is part of the growing phenomenon of labour market globalisation and the concomitant globalisation of the market for knowledge-intensive services such as health care.

Several of the examples have to do with technology, and at first it might seem that technology really does not have much to do with general development in resource-poor countries. But there is evidence that not only is technology important for human development generally (UNDP 2001), specific cutting edge biotechnologies can be important for improving health in developing countries (Daar et al. 2002: 229–32) and can serve to implement the UN Millennium Development Goals (Acharya et al. 2003: 1434–36).

Finally, it remains to be noted that the purpose of this paper is not to argue for, or encourage, emigration of skilled workers, particularly health-care workers. It is meant to explore and review identified options on how source countries might benefit from their emigrant communities in ways that they would not otherwise, without specific organisation and forethought. Many countries, as can be seen from the examples below, have begun to explore these avenues.

[4] There is a Department of Diaspora Affairs in the Greek Government.

1. Brain Gain Options

There is much talk of "knowledge societies" (Persad et al. 2006) and how low- and middle-income countries need to develop their own knowledge societies to create wealth and jobs for their citizens; a resource increasingly identified to leverage on is countries' own knowledge workers' diaspora. Labour is increasingly on the move across national borders as barriers to mobility are being gradually eased or removed to meet a growing demand for certain skills and talent across countries. This is particularly true in the case of highly skilled labour, whose mobility is increasingly controversial for what it represents of cross-border flow of knowledge. The debate about the benefits and losses of skilled migration (seen as a "brain drain" for source countries and "brain gain" for receiving countries) reveals that this is a complex subject, and one in which all the costs and benefits to various stakeholders have not yet been carefully studied (Miller et al. 1998). The hypotheses for the causes of brain drain are numerous and are always influenced strongly by the home country. Typically, weak economies, political instability, public sector downsizing and the resulting unsupportive work environments are blamed.

The overall implications of brain circulation dynamics are complex and often the winners and losers are less clear when analysed in some detail. The most obvious loss for the home countries is that of public investment in higher-level education, including most relevantly here the education of health-care professionals (physicians, nurses, pharmacists, laboratory technicians, etc.). Some have argued that a brain drain might paradoxically increase the productivity of an economy. The productivity occurs when successful emigration is not a certainty, and when the increase in human capital accumulation by people wishing to become eligible to emigrate causes a change in long-term income distribution that outweighs the decrease in human capital caused by the brain drain itself (Mountford 1994). For example, when immigration is facilitated for holders of degrees or other forms of higher education, the incentive to acquire these qualifications among the youth of a sending country increases. It is this latter increase that affects the local economy positively, as it is certain that not everybody will qualify in the end. (This might, for example, be the case in the Philippines (Diamond, 2002), where large numbers of nurses are trained, and not all then have the opportunity to emigrate.) Others have argued that for some (developing) countries it is better to train scientists and engineers for export as the proportions of their earnings that will be remitted to the source country outweigh the losses resulting from their migration (Goladfarb 1984).

2. Possible Avenues for Home Country Benefits

2.1. Fruitful linkages and networks

Increasingly, the focus seems to be shifting from viewing migration as a one-way path to conceptualising it as a dynamic process of networking and linkages. In particular, there has been growing interest in the extent to which expatriate

scientists from the "South" develop professional linkages with their home countries (Meyer and Brown 1999). Gaillard and Gaillard (1998) have made an important contribution to the debate by introducing the notion of *brain circulation* as a positive form of scientists' (and other highly skilled professionals') mobility. A survey by Zweig and Changgui (1995) found that more than 31 per cent of Chinese scientists who remain in the United States have relatively frequent contacts with their home institutions in China. Likewise, Saxenian (1999) found that Indian and Chinese scientists maintain extensive professional relationships with other institutions in their home countries, becoming more or less *transnational* citizens. They have become part of the "global me" (Zachary 2000). A thorough analysis of such transnational relations has been provided by Coe and Bunnell (2003), who argue that transnational knowledge networks are no less important than regional and national knowledge networks.

In a recent study Barré and Meyer (2003) observe that "in recent years, however, some expatriate engineers and scientists from what we now call 'countries of the South' working in 'the North' have been organising among themselves – for mutual aid and information sharing, but also to help their home countries' institutions and scientists in various ways." This phenomenon is increasingly known as the "diaspora option". It allows scientists to leave for training and work in target countries and emphasises the development of strong links to encourage active, effective and productive involvement in the development of the source country. Meyer and Brown (1999) categorise these into four types: student/scholarly networks, local associations of skilled expatriates, expert pool assistance through UN initiatives, and intellectual/scientific diaspora networks.

Notionally, the objective does not envisage temporary or permanent physical return (Meyer and Brown 1999) but encourages and supports so-called "distant cooperative work". The approach requires connecting expatriate knowledge networks through the internet and other means of communication. The same improved communications and increased mobility that allowed the scientist to immigrate in the first place ensure that members of the diaspora stay connected with the source country, consequently increasing self-awareness of their dual identity (Honore 2003). However, while information and communication technology might help to redeem some of the lost benefits of an emigrant community, it is doubtful whether it can substitute for physical presence. It is often the case that knowledge transfer requires face-to-face interaction between those involved and is a prerequisite for engendering a process of "collective learning" specific to a "community of practice" (Brown and Duguid 1991; Wenger 1998).

2.1.1. Knowledge-transfer networks

Knowledge and technology transfers are a primary way for developing countries to benefit from highly skilled emigrants (Damtew 2000, cited in Lowell 2001). Knowledge transfer can take place through various channels. The most obvious is the actual physical return of skilled emigrants to their home country. The Hsinchu

Science-Based Industrial Park in Taiwan is one example of such a channel for knowledge transfer. Silicon Valley returnees stand behind half of the companies started in the park, which now accounts for 10 per cent of GDP in Taiwan (Lucas 2001).

Whether emigrants are permanent, or a short- to medium-term temporary loss, their linkages to their source country create opportunities to increase the available knowledge and technologies to boost productivity. In fact, the physical return of expatriates need not be permanent or of a long nature: short, targeted visits by highly skilled emigrants to their home countries can also serve as a channel for knowledge transfer. This is what the United Nations Development Programme (UNDP) has sought to do with the TOKTEN (Transfer of Knowledge Through Expatriate Nationals) scheme. TOKTEN aims to reverse patterns of brain drain by encouraging expatriate nationals to volunteer their expertise in the service of their homelands for short periods. The TOKTEN programme for Lebanon is often cited as one successful result (Safieddine et al. 2004). Another network-based programme that is not geared exclusively towards the diaspora but seeks to operate similar knowledge networks is the "Visiting Scientist Programme". This programme, co-sponsored by the International Council for Science (ICSU), the Academy of Sciences for the Developing World (TWAS) and UNESCO, supports visits by senior scientists of a minimum stay of one month to institutions located in developing countries.[5]

2.1.2. Digital knowledge networks

A highly skilled diaspora can make contributions to a home country without physical relocation. Using advanced information and communication technologies and other means of communication, highly skilled expatriates may form professional networks to accelerate knowledge transfer to their home countries. An online approach is perceived as an increasingly feasible option because a highly skilled diaspora is usually highly educated and computer literate. The popularity of the online option is demonstrated by the fact that around seventy-three diaspora groups have been experimenting with it (Turner et al. 2003). Its effectiveness, however, remains far from clear, particularly for the reasons mentioned earlier. The lack of necessary face-to-face contact and the insufficient amount of physical presence cast doubt on the effectiveness of digital networks in transferring tacit knowledge and experience. Digital networks might serve as a useful complementary rather than a substitute tool for local knowledge development.

Recently, UNESCO has released on the web the first edition of a "Virtual Laboratory Toolkit" whose purpose is to enable scientists in developing countries to establish and participate in so-called "centres without walls" through new modes of computer-mediated collaboration (Turner 2003). The Virtual Laboratory concept is defined by the UNESCO working group that produced the toolkit as "an

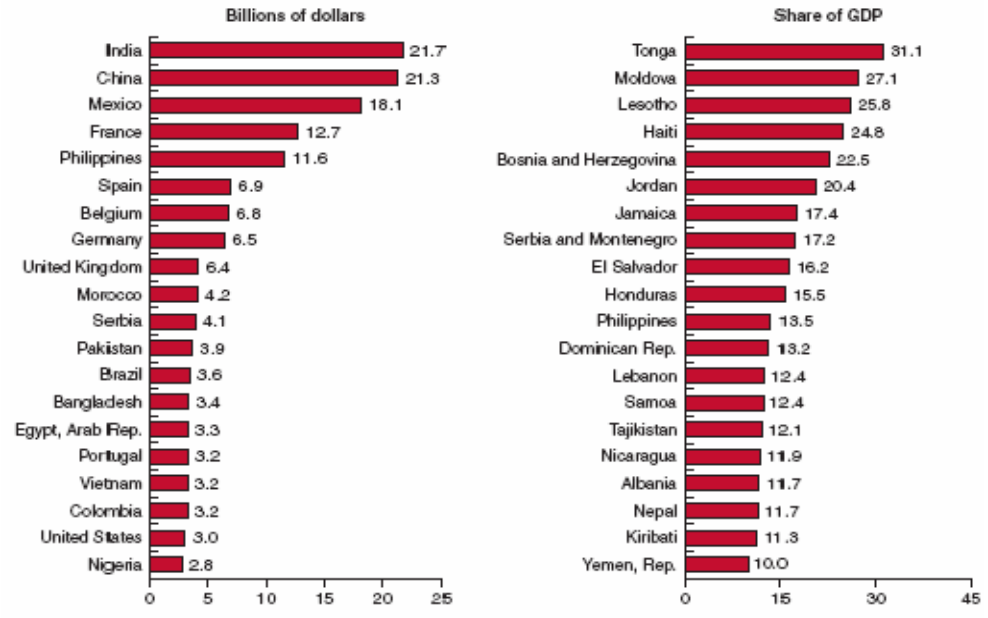
[5] http://www.ictp.trieste.it/%7Etwas/vis_sci.html

electronic workspace for distance collaboration and experimentation in research or other creative activity, to generate and deliver results using distributed information and communication technologies" (Vary 2000). Virtual laboratories are emerging in a number of areas: the international human genome collaboration, the association of astronomical facilities called the "whole-earth telescope", the planned construction of long-baseline interferometry laboratories, and global observation networks for the environmental sciences are just some examples (Turner 2003). These platforms can provide access to scientists from developing countries to participate in international science and become better integrated in the international scientific community.

2.2. Remittances

In a network of worker and financial flows, the relationship between source and receiving countries does not have to be a relationship between losers and winners. The source countries in particular can benefit in a variety of ways. Despite the controversy about the extent of their benefits to source country local development, remittances remain the most obvious benefit. Remittances can be spent on buying food, medicine, health care and consumer (and luxury) goods. Remittances introduce more money into the economy and jobs are created. These multiplier effects have been found to be quite substantial (Lowell 2001). They can provide a partial safety network from absolute poverty. Indeed, many countries are known to be heavily dependent on remittances (Ratha 2003). Figure 1 shows the high level of dependency in many developing countries.

Figure 1: Top Twenty Remittance Receiving Countries (2004)



Source: IMF BoP Yearbook, 2004, and World Bank staff estimates.

The World Bank report in which Figure 1 was cited also shows that remittances to developing countries are on the increase (74 per cent increase between 2001 and 2005). It is not clear whether this is a result of an increase in the number of emigrants or an actual increase in remittance per emigrant. An interesting observation that may need further elaboration is that education tends to reduce the likelihood that a worker remits, because highly educated emigrants are more acculturated into the host society and, hence, less committed to ongoing connections to the source country (World Bank 2006).

2.3. Foreign investments

Investments by expatriates in their home countries are another source of benefit from a diaspora. Expatriates are relatively more likely to invest in their own country of origin, because they are better placed to evaluate investment opportunities and possess contacts to facilitate this process (Lucas 2001). In 1998, for example, 70 per cent of China's $50 billion foreign direct investment (FDI) came from the large Chinese diaspora. Likewise, India's technology-oriented diaspora stand behind much of the FDI in the country's emerging technology hubs of Bangalore and Hyderabad (Devan and Tewari 2001). Indeed, the Indian diaspora are the biggest investors in advanced medical services in India, a vibrant sector that caters largely to the Indian middle class, but also to many patients from overseas who bring foreign exchange and jobs to India. Indeed, some Indian health-care workers who had emigrated to Europe and the United States have returned to India because of the opportunities and rewards of working in this private sector. Indian hospitals are now offering their services to the UK National Health Service to send patients to India for surgery, at half the cost in the UK, as a way for the NHS to cope with its lengthy waiting lists.[6]

Lucas (2001) suggests that expatriates may also encourage investments in their country of origin by foreigners. Successful direct investment frequently demands a local facilitating partner. Emigrants are well placed to identify more trustworthy and competent partners. Moreover, returned migrants, known to the foreign investor, may even take on this role of being the local counterpart, partner or expert. Furthermore, Lucas adds that "there is also evidence to indicate that presence of a larger Chinese diaspora, in common between two countries, has a major effect in enhancing bilateral trade".

To sum up, expatriates are relatively more likely to invest in their own country of origin; they are better placed to evaluate investment opportunities and possess contacts to facilitate this process.

[6] http://www.india-emb.org.eg/Archives/July1,%2003/UK%20Looks%20to%20Indian%20Hospitals.htm

3. Possible Leadership Models for Action

3.1. Government leadership

The return or repatriation of members from a highly skilled diaspora is strongly influenced by the state of economic development of the home country and the policies of its government. Also the return of long-term emigrants back home is often not without its challenges (Faini 2003). Government intervention, however, can help to make things less challenging, especially for highly skilled emigrants. In the Republic of Korea, efforts to encourage repatriation have been coordinated by the Ministry of Science and Technology (MOST) and in Taiwan by the National Youth Commission (NYC). In both contexts, government support for development of research centres and high technology clusters has played a key role in the repatriation strategy. The Korean Government subsidised and supported professional associations of Korean scientists in Canada, China, Europe, Japan and the United States. By their nature, they were based on national initiatives shaped to a large extent by an active government policy. Other countries will need to consider such support if they wish to maximise the benefits from their diaspora. A number of governments are now starting to look with interest at these two experiences in order to develop similar policy tools. For example, in order to develop its biotechnology industry, China is trying to attract the Chinese diaspora back to the country – to physically repatriate them. Through a well-organised and well-funded programme, it has financed the development of the correct infrastructure. Beijing has announced a drive to attract 200 scientists of the estimated 20,000 Chinese scientists abroad with the promise of "Western-style" salaries (*The Economist*, 2002).

Other examples of government-led initiatives or those with significant government support include the Nigerians In Diaspora Organization (NIDO), an initiative of the Government of Nigeria. NIDO has been established in various countries in Europe and the United States. Likewise, the South African Government has given support to the South African Network of Skills Abroad (SANSA), which is a joint venture between a prominent local research group, the Science and Technology Policy Research Center (STPRC) and a leading French governmental agency for scientific cooperation (Meyer 2001).

3.2. Community leadership

The experiences of other countries show a less active or direct role by government and a greater role at the community or grass-roots level. Grass-roots initiatives in Latin America and South Africa have been developed to link researchers abroad to networks in their home countries. The Armenian diaspora in the US actively sponsors and organises development projects in Armenia. For example, Armenian Engineers and Scientists of America (AESA), a non-profit tax-exempt organisation, helps educational institutions in Armenia to obtain computers.[7] The Network of

[7] http://www.aesa.org

Arab Scientists and Technologists Abroad (ASTA), headquartered in Champaign, Illinois, is another grass-roots initiative; among its aims the establishment of an electronic directory (database) for scientists and technologists of Arab origin who work abroad in advanced industrial countries. The purpose of this initiative is to help to create an effective mechanism through which scientists may be contacted by Arab institutions interested in their specific expertise as advisors, consultants, instructors, researchers, participants in and organisers of seminars and conferences, etc. at governmental or private institutions in the Arab world or with Arab institutions abroad.[8]

3.3. Leadership by international bodies

An ever-increasing number of "top-down' initiatives are being driven by international organisations. An interesting example is the "Digital Diaspora Network", which is part of the UN Information and Communication Technologies Task Force. It aims to promote development and the achievement of the Millennium Development Goals through mobilising the intellectual, technological, entrepreneurial and financial resources of diaspora entrepreneurs. Thousands of internet nodes and digital activities are taking shape in many developing countries, although in the early phase they usually lack the capital, expertise and networking ability for stable growth. Such digital diaspora networks, which will mobilise expatriate leaders and entrepreneurs to underwrite and mentor these developments, are now being formed for Africa, the Caribbean and Latin America.[9]

3.4. Institutional-based models

The diaspora option may be organised and motivated under the leadership of a single institution. University-based initiatives tapping into alumni overseas organise events and projects that target home students' needs and/or the further development of the home institution. For example, various overseas chapters of the American University of Beirut raise funds to provide scholarships for students to enrol in the university. The MIT Arab Alumni organises on a yearly basis a conference in the Middle East on technology development and transfer that is attended by high-profile persons from around the world. The global image of the Indian Technology Institutes quite clearly derives from the spectacular success of its alumni, who obtained undergraduate (B.Tech.) degrees in various disciplines of engineering (Balaram 2003). The Chinese Institute of Engineers in the US organises an annual seminar in collaboration with their counterpart organisation in Taiwan and provides consultative services to the Government of Taiwan (Lucas 2001).

[8] http://www.asta-net.org/
[9] http://www.unicttaskforce.org/about/principal.asp

4. Health and Health-Care Related Professions

Less often cited is the movement of specialists in the health and medical related professions to areas at the cutting edge of science in their field. More than in other sectors, health care is both knowledge-intensive and highly labour-intensive, dependent on an estimated 35 million workers worldwide (Chen 2003). The loss of medical professionals decreases the quality of care in the home country. For example, in the US, chronic shortages have resulted in more than 35,000 immigrant doctors from India. Even with ample funding and ample medication, lack of qualified nurses, for example, is cited as the largest impediment to adequate AIDS/HIV treatment in Africa (Chen 2003). Furthermore, the lack of trained professionals also affects the training of the next generation of professionals (or the "social reproduction" as Chen calls it). India has calculated a loss of $5 billion from the emigration of doctors over the past fifty years.

Doctors from Thailand who have learned modern medical hospital management in the United States are now bringing these skills home and setting up world-class hospitals accredited by the US Joint Commission and catering to an international clientele that includes US citizens (personal communication, Suwit Wibulpolprasert, Ministry of Health, Thailand; Co-Chair of the Demand Working Group, JLI).

With globalisation and increasing needs and demands for health-care professionals in the economically more-developed countries, the trend has been to draw human resources for health from poorer countries. In a 1998 survey of seven African countries, Dovlo (1999) found vacancy levels in the public health sector to range between 7.6 per cent for doctors in Lesotho, 72.9 per cent for specialists in Ghana and 52.9 per cent for nurses in Malawi. The countries on the "gaining side" are interested in attracting foreign health-care professionals because they are understaffed and faced with huge gaps in health staff to cater for their ageing populations, caring for whom is very labour-intensive.

5. Complex Dynamics

The complex dynamics of health-care movements are well illustrated in the case of nurses in Australia, as described very well in Lesleyanne Hawthorne's analysis of the Australian nursing system (Hawthorne 2001). Australian trained nurses are moving abroad, leaving gaps at home and a requirement for new supplies of nurses. Overseas qualified nurses, from both English- and non-English-speaking countries, are vying to move to Australia to be gainfully employed and create a new and improved life for themselves. Because of the fluidity of movements, at any given time, the equation may not have balanced out. Many foreign-trained nurses are unemployed or underemployed. The countries sending the nurses to Australia are left without adequate nursing staffing to address their own needs (Hawthorne 2001: 215). In some of the more fortunate source countries, such as the Philippines, large numbers of nurses are trained, in some cases specifically to cater for foreign

markets, from where workers are free to relocate to other countries (Chen 2003). Similarly, Hungarian physicians go to the West, Lithuanian physicians go to Hungary, and there is then a shortage of personnel to fill Lithuanian posts.

> What sets the Philippines apart from other countries whose legions also spill over their borders into wealthier lands (200,000 Malaysians commute *daily* to Singapore, for instance; some 200,000 Thai nationals, or about a third of a percent, leave home to work elsewhere each year) is that the federal government here is avidly encouraging the flow. In an example of socioeconomic engineering on an unprecedented scale, the Philippine leadership is embracing its role as temp agency to the world and structuring a political "business plan" accordingly. Although the ratio of remittances to GNP in nations like El Salvador and Cape Verde tops that of the Philippines, no other government maintains so sprawling a network of workers with as strict a hand (Diamond, 2002).

The situation is often pitted as a North vs South battle, an urban vs rural conflict or a developed vs developing country struggle. For the source countries, the policy question is therefore no longer whether this phenomenon should be allowed to happen, but rather what policies should be put in place to derive maximum benefit for source countries while allowing their emigrants to thrive and also contribute to the countries where they have settled.

Note that not all receiving countries are in the rich industrialised North; many developing countries are also recipients of significant numbers of highly skilled health workers. Arab Gulf countries, for example, have large numbers of expatriate health workers. Some of the movement between developing countries is facilitated by international aid programmes such as the Aids Fund.[10]

Cuba is a particularly interesting player in the complex dynamics of health-care worker migrations and financial flows. The country earns a lot of foreign currency from educating foreign doctors. The International Medical School of Havana, for example, trains large numbers of doctors every year. Some of these may not have qualified to enter medical schools in their own countries of origin; some return to their own countries, while others emigrate to third countries. Cuba is also recognised around the world for its high medical standards and facilities for advanced medical care. Patients from the Chernobyl disaster were taken there for treatment, including bone marrow transplants, for example.

Furthermore, not all mobility or migration is strictly international. Substantial migration also takes place within countries. In Brazil, there is strong outward migration of health workers from the Amazon region to São Paolo. Some students who fail to qualify for medical school in São Paolo go to medical school elsewhere and after qualifying as doctors return to their home regions in the more affluent parts of the country.

[10] For example, the global HIV fund makes Filipino doctors go to Zambia.

There is also inequality in the North; there are underserved areas. Some countries in the industrialised North (as in the UK and also Canada) have not trained enough health-care workers and are now struggling to cope. What is also interesting and significant is that some developing countries have an excess of health-care workers in certain areas of specialisation. For example, Argentina, Egypt, Mexico and Morocco have an excess of doctors,[11] while the Philippines has an oversupply of nurses. Kazakhstan, Kyrgyzstan and Lithuania are oversupplied with specialist doctors (Wahba 2003).

The situation is even more complex, for there are also inter-sector movements between private and public sectors and from health to other professions, both in developed and developing countries. Furthermore, we do not yet understand reverse flows, such as that of missionaries to developing countries, or any moral issues that might be specific to health-care workers.

This complex picture of human resources development, mobility and retention certainly needs further study.

6. Options for Human Resources Gain in Health Care

The provision of human resources in adequate quantity and with appropriate competence to provide health-care services is critical to health planning in any country (Wahba 2003). Yet the shortage of health personnel has been a common problem for many countries, especially in sub-Saharan Africa. In the 1980s, for example, the doctor:population ratio was 1:10,800 in sub-Saharan Africa, compared to 1:1,400 in all developing countries and 1:300 in industrialised countries (ibid.). Stalker (2000) estimates that there are around 1.5 million professionals from developing countries working in industrialised countries. Although medical practitioners and nurses make up only a small proportion of professional migrants, the loss of human resources for health in developing countries usually results in a loss of capacity of the health system to deliver health care equitably (Stilwell et al. 2003).

The diaspora of health-care professionals should be approached and studied as a potential resource for finding a solution. These workers represent a successful part of the brain gain and have been an active part of the brain drain. If the high-tech diaspora can be taken as an example, they have a potentially untapped will to help their home country. The key will be to create productive forums in which the health-care professional diaspora can actively participate in the development of policies and programmes to address the problems created by labour mobility in their home country. Repatriation of knowledge, money, skills and connections, rather than the return of the professional mediated by the diaspora networks, may

[11] In some of these countries the excess is more apparent than real, as there is often a poor distribution, with rural and deprived areas experiencing a shortage.

prove more feasible and economical for those countries without financial resources and scientific infrastructure to promote brain gain.

The UN initiative with the ICT sector through the establishment of digital diaspora networks might prove to be a viable, albeit partial, option for reducing the impact of brain drain on the health sector of poor countries. Exploring the wider and systematic use of telemedicine, e-health or tele-health to deliver medical services to people in remote settings through the use of (diaspora) telemedicine networks might be one form of "diaspora option" that some developing countries would want to pursue. It is reasonable to believe that telemedicine cannot be deployed in poorer countries as widely as it could be in advanced countries due to the lack of an adequate ICT infrastructure, which is expensive. However, telemedicine can be deployed to complement and fill certain gaps at hospitals and medical institutions in poorer countries and regions where such resources are available.

As in the case of digital diaspora networks, the UN and other international agencies can help to establish and organise such virtual medical organisations. These benefits have been demonstrated by SATELLIFE, a charitable organisation based in Boston, USA. Using a low earth orbit satellite and phone lines, it provides e-mail access in 140 countries, serving over 10,000 health-care workers.[12] The rapid growth of satellite phones, cell phones and wireless networking is helping to overcome the problem of disconnectivity. SATELLIFE for example makes telemedicine available even in isolated regions in poor countries.[13]

Another example is an organisation called WorldSpace. Founded in 1990 by an Ethiopian emigrant, it began with the vision of using direct audio broadcast via satellite to stop the spread of AIDS in Africa, but that horizon quickly expanded to providing digital satellite audio, data and multimedia services primarily to the emerging markets of Africa and Asia. To implement this vision, WorldSpace conceived and built the first satellite radio infrastructure in the world.[14]

While international bodies have started to address the situation, such as the World Bank with its Millennium Science Initiative (Asmal), local organisations such as BIO-EARN are also valuable. BIO-EARN[15] is focused on addressing local research questions, training scientists and technicians, building laboratories, developing bio-safety regulatory frameworks and risk-assessment capability, and fostering intelligent policies on intellectual property. It has already partnered with local research institutes in Ethiopia, Kenya, Uganda and the United Republic of Tanzania, as well as some European institutes in Sweden.

[12] Information technology and telemedicine in sub-Saharan Africa: economical solutions are available to support health care in remote areas (Fraser and McGrath 2000).
[13] http://www.healthnet.org/history.php
[14] http://www.worldspace.com
[15] http://www.bio-earn.org

BIO-EARN still suffers from a dearth of skilled professionals. The diaspora could bring the expert advice needed at a time when skilled professionals are limited. Conversely, the East African diaspora needs a group such as BIO-EARN to help them to realise their potential. Such collaborations create the necessary dynamics for brain circulation, which ultimately benefit all.

7. Some Thoughts on What Governments Can Do

Politically, it is perhaps safer for governments to pursue policies that encourage repatriation rather than discouraging emigration,[16] especially in developing countries where career opportunities might be scarce or less lucrative. Thus, the idea of working with the diaspora is politically safe. Yet, although the idea appears straightforward and appealing, "putting it into operation is more complicated" (Gaillard and Gaillard 2003). Different diaspora communities will have different needs/ingredients for success. Gaillard and Gaillard have observed that the necessary requirement of a sustained administrative capacity and the existence of a substantial scientific community are far from being fulfilled by all developing countries, notably in Africa. Therefore government support is eventually and inevitably crucial.

Government pro-active policy options

1. *Government can lead and coordinate the effort required in reconnecting the diaspora with the scientific, economic and industrial community of the home country.*

Meyer et al. (1997), in their analysis of the Colombian Network of Scientists and Engineers Abroad, point out that enormous financial and administrative support is required to create the necessary up-to-date database of highly qualified nationals and to mobilise and organise these individuals.

Egypt has several agreements with a number of African, Arab and European countries allowing Egyptian doctors to have sabbatical leave and go overseas to work for two to three years. On return they could go back to their public employment.

2. *The diaspora's contributions should be recognized and extolled by the home country government.*

For Africa, for example, it is important to shift from a hostile attitude towards its emigrant nationals to recognising and extolling their present and potential contributions (Gaillard and Gaillard 2003). Already, some African countries have

[16] South Africa has such a policy of discouraging early emigration of personnel trained through government scholarships. Graduates have to work for three years within South Africa. However, they can leave if they refund the money.

moved to permit dual citizenship in order to allow nationals to move between two countries more easily (Honore 2002). Additionally, the newly established African Union (replacing the former Organization for African Unity) has invited Africa's diaspora (those who trace their roots back to the continent) to actively take part in the region's development (Mutume 2003: 1).

3. *Governments must make efforts to engage with their diaspora and adequately communicate their specific enabling policies.*

The diaspora need to be shown ways in which they can contribute to home country development, through the introduction of exchange programmes, taxation programmes, and other types of clear channels for contribution to the home country. For example, the Nigerian president Olusegun Obassando often meets with Nigerian expatriates during his travels in America, Asia and Europe to encourage them to contribute with their services to the nation. Furthermore, the diaspora needs to feel and know that their efforts have impact.

4. *Receiving countries should explore ways in which immigrant communities can act as mutually beneficial bridges with source countries.*

Governments in the receiving countries could make greater efforts to work with their immigrant populations to reach and tap foreign markets for bilateral trade, develop overseas investment opportunities, and build on global knowledge networks. With some imagination and long-term planning, such efforts may well become key planks of their foreign policy.

8. Conclusion

The nature of health care and the pressing needs of developing countries are such that there may well be compelling moral arguments to discourage the migration of health-care workers; and those countries that benefit from such migrations may have a moral obligation to compensate the source countries in some way. However, the outward and inward migration of highly skilled labour, particularly in the health sector, appears to have become an established and complex reality. It is part of an increasingly globalised labour market and the rise of a transnational health service system of providers, services, financial services and patients.

We do not take a position here on the moral probity of these movements of people. We point out that it is possible to benefit from the diaspora. However, the benefits may not come without developing policies that are based on evidence, particularly of success stories.

Note

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Brain Drain and Innovation Systems in the South*

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Underdevelopment in a great part of the world is as strong today as it was fifty years ago; however, some of its features are changing due to the combined action of globalisation and the renewed power of knowledge. Understanding these changes is the key to devising effective development strategies: the National Innovation Systems (NIS) approach can be useful for this purpose. NIS in the South are weak and incomplete, so some of their structures "seek" to attach to more developed ones in the North: this weakness may be seen as one of the many "brain-drain" drivers. The paper explores the contribution of the NIS perspective to policies devoted to knowledge and learning accumulation in developing countries; it argues that empowering NIS in the South can contribute to halting brain drain and fostering brain rearticulation.

Even if important economic and social aspects of underdevelopment are as notorious today as they were yesterday, the actual drivers of the situation are not exactly the same. Two fundamental and strongly intertwined changes shape underdevelopment at present: the process of globalisation and the renewed divisive power of knowledge. Both sharpen the social divide between those able to learn and work in a learning environment, and those marginalised from one of the main sources of self-reliance and self-esteem. Section 1 develops a way of characterising underdevelopment related to the position of each country in a "learning map"; conclusions around qualified migration are drawn from this analysis.

Underdevelopment has long been acknowledged as not being merely an interim stage on the road to development; convergence towards the basic elements that constitute whatever we may call a "developed situation" is not assured. A weak capacity to relate creatively to knowledge for problem-solving is a main factor of divergence, as well as one of the key distinctive features of underdevelopment today.

The National Innovation System concept attempts to capture the ability of a national landscape to foster the production of knowledge and its creative use to find innovative ways to address and solve problems. It has been argued that

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differences in NIS are important explanations of diverging patterns of development (Freeman 1995). One of the first characterisations of the concept was by Christopher Freeman: "… the network of institutions in the public and private sectors whose activities and interactions initiate, import, modify and diffuse new technologies" (Freeman 1987). Three key elements of NIS, also present in the conceptualisations made by influential scholars in the field (Lundvall 1992; Nelson 1993), are institutions, interactions and capacities to create and use new and economically viable knowledge.

The NIS concept was coined to describe the innovative situation and perspectives of highly industrialised countries. It can also be a useful analytical tool in developing countries because it highlights the relevance of a number of social actors, thus going beyond the schematic opposition between state and market; it focuses not only on economic but also on political, institutional and cultural issues; and it directs attention to some concrete interactions between actors and organisations, offering a general framework for study. However, to be really useful the concept should be analysed through "Southern lenses". This is attempted in Section 2, where consequences for competence building and competence retention are highlighted. Section 3 presents some policy mechanisms to empower NIS in developing countries; it is suggested that these systems can also serve to halt brain drain and as rearticulating mechanisms. Finally, the conclusion suggests that, in the rapidly growing transnational systems of innovation, skilled people of a given country, both at home and abroad, can combine their efforts towards fostering the development of that country, provided its NIS is sufficiently strong.

1. The Learning Divide as Brain-Drain Driver

Knowledge is a great destabilising force of our time. Knowledge has created enormous wealth as well as conflict and suffering; it has revolutionised not only material existence but also "the way people look and feel" (Mokyr 2002: 2).

The destabilising power of knowledge affects social relations and habits, enlarging benefits and opportunities as well as risks and damages. But that happens in a very asymmetric way, so knowledge is now a key factor of inequality between people and particularly in one of its most salient manifestations, underdevelopment. One of the expressions of this asymmetry is the differential "attractive and retaining power" of different societies regarding their best trained citizens. The low level of such power in underdeveloped countries is both a result and an ongoing cause of underdevelopment.

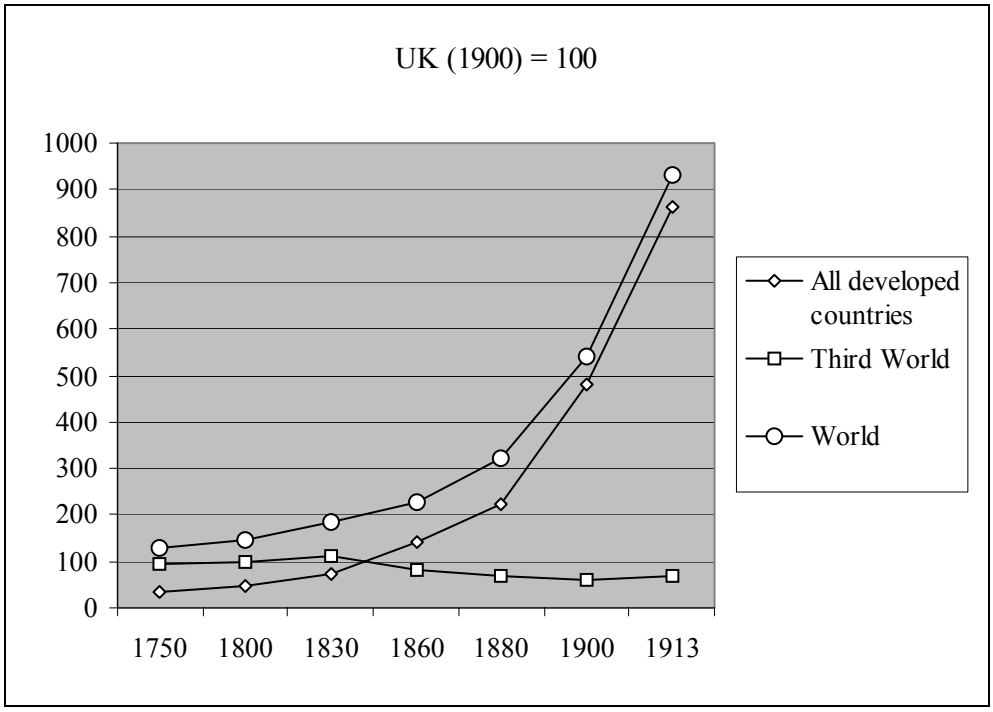
The learning prospects of any social agent are highly dependent on the capabilities stemming from acquiring knowledge, as well as on the opportunities to enhance acquired knowledge by using it creatively. These two types of situation are rooted in quite distinct social processes and institutions. The first has mainly to do with access to education and training; the second is chiefly associated with the social demand for knowledge. It is important to stress that learning is a composite process

implying these two movements, one towards studying and the other towards creatively solving problems.

Development trajectories have always been to some extent related to learning prospects; this is particularly so in the current global knowledge economy. Learning prospects are influenced by the setting and evolution of innovation systems at local, national or "transnational" level. So, from a developmental point of view, the relations between learning prospects and Innovation Systems deserve special attention.

It is said that a good prospective must start by a good retrospective. Figure 1 may be a suitable starting point.

Figure 1: Gross Industrial Production 1750–1913



Source: Mann (1993: 262).

The figure suggests that during the second half of the nineteenth century, in some countries, a great increase in the social demand for knowledge took place in association with the rise of industrial production. At the same time, the sharp decline in the global industrial production share of the "Third World" shows that such demand remained structurally weak there.

Learning prospects began to diverge in this period. In "all developed countries", a wealth of teaching and training institutions flourished, and research became a

profession cultivated in universities, assuring the social reproduction of a specialised intellectual working force. In particular, engineering understood as an academic discipline was the mark of the North American "translation" of the German nineteenth-century innovation of the research university: the "wedding of science with the useful arts" that took place there included the early integration of academic science with the practical orientation of teaching and research in engineering (Ben-David 1984; Noble 1977). In the "Third World", universities also flourished. The overall unbalance in terms of the production of new knowledge is, however, striking: at the turn of the nineteenth century developed countries represent a fifth of the world population and slightly less than two-thirds of world GDP, more than 80 per cent of world R&D expenditure and more than two-thirds of world number of researchers (UNESCO 2001).

The divergence shown in Figure 1 still exists 150 years later. A growing demand for knowledgeable people, inside and outside national borders in developed countries, is the outcome of a "knowledge based and innovation driven" evolving economy (de la Mothe and Paquet, 1996). The poor and stagnated "learning situation" of the South recognises different causes. Some are deeply entrenched in underdevelopment itself, such as long-term social inequality; others are related to myopic policy views about the role of research and higher education in development. Another fundamental cause is the lack of sustained, inward-oriented, demand for knowledge from production sectors.

Two different ways of estimating this demand are the number of researchers employed in industry and the weight of the production sectors able to diffuse technical knowledge (ICT, bio-tech, specialised machinery) in the industrial structure. The difference between North and South in both indicators is net: while in OECD countries more than 50 per cent of all researchers work in business, in Latin America for example the figures are, on average, well below 20 per cent (OECD 2005; RICYT 2005). Over 25 per cent of the industrial structure of most OECD countries was by 1970 already occupied by "diffusers of technical knowledge" productive sectors; for many this figure had passed 40 per cent by 2000. Several Asian countries exhibit a striking evolution in this indicator. Particularly interesting is the case of the Republic of Korea, given the relatively low participation of multinational companies in the process: the weight of diffusers of technical knowledge was 10.7 per cent in 1970 and 63.0 per cent in 2000. In Latin America only two countries show a positive evolution of this indicator between 1970 and 2000, Brazil and Mexico; for the rest the indicator at the end of the period has a lower value than at the beginning (Cimoli et al. 2005). The case of Argentina deserves special comment: the knowledge demand from production approximated by the proportion of diffusers of technical knowledge in the industrial structure diminished from 22.7 per cent to 14.7 per cent in the last thirty years of the twentieth century, and the weight of production based on natural resources grew from 54.8 per cent to 69.9 per cent in the same period. This is a good example of what has been termed "re-primarisation", because the weight of the primary sector in the productive structure is again very high, as was the case

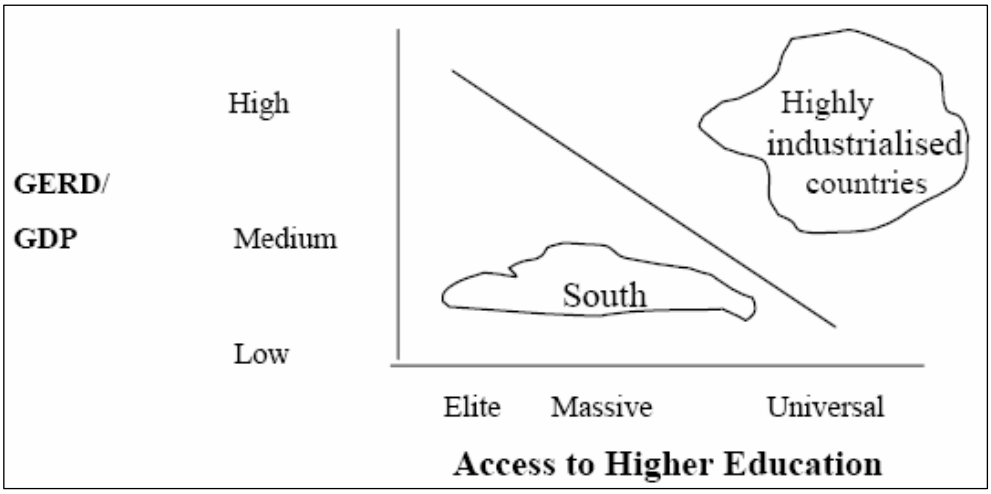
until the beginning of the twentieth century. At the same time, if compared within the region, Argentina has by far the highest proportion of researchers in relation to the population, as well as exhibiting one of the highest rates of brain drain.

The loci where knowledge is used and produced with the aim of solving problems, that is, where innovation as an interactive process is pursued, can be seen as "interactive learning spaces" (Arocena and Sutz 2000*a*). These can be highly institutionalised within organisations or ad hoc and even transient arrangements, in the same vein as "Mode 2" of knowledge production as presented by Gibbons et al. (1994). The main point is that they provide the "space" where different actors are able to strengthen their capabilities to learn while interacting in the search for the solution to a given problem. Interactive learning spaces can be seen as a synthesis between knowledge capabilities already acquired and opportunities to apply them creatively, allowing people to go on learning and accumulating knowledge while interacting in problem-solving activities.

This concept helps us to focus on the opportunities aspect of learning situations, something that is usually taken for granted in highly industrialised countries. There, encounters are relatively fluid between those who need knowledge to solve a problem and those able to interact with them in order to recognise useful existing knowledge, to detect missing knowledge, to organise the search to acquire it and, finally, to help to integrate the new knowledge into the previous base and the whole into current practices. Highly industrialised countries are "interactive learning spaces rich". This type of encounter is not at all fluid in the South, not only because of the relative scarcity of capabilities, but mainly because of the severe scarcity of opportunities to put them to work. Thus the South is "interactive learning spaces poor". Using different phrasing, this has already been recognised by mainstream literature on development problems. Hirschman (1958), for example, stated that development depends critically on being able to put to use for development tasks resources and capabilities that are hidden, scattered or underused. Part of this effort has to do with promoting interactive learning spaces where knowledgeable people can maximise their problem-solving capacities.

The richness in interactive learning places of a given country can be approached by the position it occupies in a pair of Cartesian axes, a "learning map", where the *x*-axis measures access to higher education as a means of acquiring knowledge and the *y*-axis approximate opportunities to apply knowledge creatively by the proportion of gross expenditure on R&D in GDP (GERD/GDP). These figures have the advantage of being available for most countries as well as being fairly up to date. When this exercise is done for a sufficient number of countries, a clearly dichotomised learning map appears, leaving the highly industrialised countries above a 45-degree line, and the countries of the South below the line (Figure 2).

Figure 2: The Learning Divide



Source: Arocena and Sutz (2000*a*).

The divide between highly industrialised and Southern countries shown in the figure may be termed a "learning divide". Underdevelopment today can be partially conceptualised as being below the learning divide, with severe difficulties in crossing it; this is a way of taking into account the renewed dividing power of knowledge when analysing development processes. For societies as a whole, crossing the line implies travelling along the *x*-axis away from a situation in which only a tiny proportion of the population is able to attain higher education. It also implies moving up the *y*-axis to situations where the opportunities to apply knowledge are significantly improved. A first assertion is that the latter is far more difficult than the former; a second is that the latter is intimately related to the "state" and possible evolution of local or national Innovation Systems. NIS are quite specific even for relatively similar countries, so comparisons are always difficult to establish. Nevertheless, the learning map shows two clusters of NIS, each characterised by a common feature: the relatively strong ones cluster above the learning divide and the weak ones below.

There are few recent examples of crossing this divide at country level. Perhaps the most striking is the Republic of Korea, where in 1953 the illiteracy rate was almost 80 per cent. The share of education rose, in the government budget, from 2.5 per cent in 1951 to more than 22 per cent in the 1980s. In that period, enrolment in elementary school increased more than fivefold, in secondary school approximately thirtyfold, and in colleges and universities almost a hundred and fiftyfold; as a percentage of corresponding age group the latter grew from 3 per cent to 26 per cent. Accompanying this process, GERD/GDP evolved from less than 0.5 per cent to more than 2 per cent (Kim 1993: 358–60). Recent figures show that higher education enrolment reached near 80 per cent.

The situation has been quite different in Brazil, where as late as 1980 almost 75 per cent of the labour force had not completed elementary school; in 1985, the proportion of the age group enrolled in secondary education was 35 per cent and in tertiary education 11 per cent, a figure that only rose to 13 per cent at the end of the twentieth century. "Brazil's education system is one of the main obstacles to the country's modernization and technological upgrading" (Dahlman and Frischtak 1993: 439–40).

The learning divide can be more easily crossed at individual level: those who live in a country that as a whole is below the learning divide but have capacities that let them work above the line, find strong incentives to migrate and cross the divide. In this sense, the learning divide can be seen as a powerful brain-drain driver. The mismatch between capabilities and opportunities to apply them creatively is the source of great frustrations. These frustrations are not only related to the eventual inability to make a decent living from what people have learned after years of effort, but to the feeling of not being needed by a society that turns its back on what they have to offer while acquiring abroad the embodied or disembodied knowledge that these same people are able to provide. As stated in the Report of the High Level Committee on the Indian Diaspora (2002: xii), interviews with expatriates revealed that "they would have rather stayed back in India if the opportunities for utilization of their talent had been available in their motherland".

Typical brain-drain drivers are low salaries, poor academic working conditions, from outdated facilities to appalling teaching duties, and routine work in productive landscapes: the hard combination of difficulties for individual survival and difficulties for intellectual enjoyment and career advancement. Brain-drain drivers also include political instability, lack of adequate levels of personal security, and low prospects of a good education for children. Some of these are more or less permanent burdens; others can appear sporadically. The Latin American Southern Cone qualified migration in the mid-1970s resulting from military dictatorships is a well known example of the latter. These factors have been extensively studied in a very important international specialised literature, both in academia and in international organisations. Such factors do not however exhaust the set of brain-drain drivers. An additional factor is the difficulty in collaborating, as citizens specialising in certain areas, in the process of development. This being the case, alleviating this last difficulty even without being able to greatly redress the others, can contribute to diminishing brain drain by giving people a sense of social usefulness, an important albeit somewhat neglected source of reward. Government policies tried in the 1980s to foster return to their homeland of Taiwanese and Korean migrant professionals relied primarily on financial incentives, most of which "turned out to be ineffective in achieving policy goals" … "Instead, the prospect of better career opportunities and the challenge of participating in their countries' further development have been major motivating factors" (Song 2003).

Even if the quantification of the brain-drain phenomenon is far from simple, as specialists warn each time they release figures, these figures, taken from different

sources, are convergent. The US National Science Foundation estimated, in the second half of the 1990s, that 12 per cent of all graduates in sciences and engineering in the United States came from developing countries, a proportion that rises at postgraduate level. It is estimated that 50 per cent of all migrants to the developed world come from South America and 75 per cent of those from sub-Saharan Africa have tertiary education (World Bank 2002: 18). Other estimates indicate that the number of R&D researchers from developing countries working at home amounts to 1,224,000, while the number working in Europe, Japan and the United States is around 400,000: one in four researchers from the South works in the North (Pellegrino 2004: 52–53). Recent work estimates that between 1990 and 2000 the stock of skilled migrants in the OECD increased by 64 per cent, the rise being greater for immigrants from developing countries (93 per cent): for Africa the increase was 113 per cent and for Latin America and the Caribbean 97 per cent. (Docquier et al. 2005: 3) In the case of South America, absolute numbers of skilled migrants to all destinations doubled between 1990 and 2000 (ibid.: 8). For the US, the Current Population Survey of 2004 indicated that immigrants holding a college degree in 2004 grew from 27 per cent in the 1980s to 34 per cent in the 1990s; as a proportion of the skilled US population, foreign-born persons over the age of 25 comprised 8 per cent in 1990, 13 per cent in 2000 and 15 per cent in 2004. "These rising yet broad averages, however, mask the vital presence of immigrants in certain occupations. For instance, according to Census 2000, one of every five doctors in the country, one of five computer specialists, and one in six persons in engineering or science occupations is foreign born. (Kaushal and Fix 2006: 4)

The following statement has been made for the US, but it also holds, if to a lesser extent, for highly industrialised countries in general: "Plainly, high-skilled immigrants are a critical resource for the knowledge-driven economy …" (Kaushal and Fix 2006: 2).

This is a major problem for development efforts. New concepts, such as brain gain or brain circulation, try to capture the positive side of intellectual and academic mobility. However, plain brain drain continues to be recognised as a great challenge for countries in Africa and Latin America (Meyer 2003). The emergence, consolidation and growth of interactive learning spaces is one of the multiple ways that help to retain skilled people at home and may open opportunities for skilled people abroad to rearticulate with their homeland. This is hard to achieve in weak National Innovation Systems, a major characteristic of developing countries.

2. On National Innovation Systems as Seen from the South

NIS are centrally concerned with institutions related in one way or another with innovation. The approach deals mainly with existing institutions and has been less focused on situations characterised by the lack of institutions, or by institutions unable, for various reasons, to perform well from an innovative point of view.

The institutional fabric relating to innovation, particularly its density, plays an important role in the strengthening of interactive learning spaces. This has been well understood in highly industrialised countries as well as in newly industrialised ones, where a great diversity of policy instruments and organisations have been devised to favour encounters for innovation. In underdevelopment, organisations without real knowledge of what innovation means in a given productive milieu, with ambitious and vague goals, badly financed and without experienced and committed personnel, often constitute the formal institutional setting for technology policy. On the other hand, the real policy, the decision-making processes that have concrete learning and innovation consequences, occur in scattered organisations, often as by-products of policies oriented towards other goals, without much care given to positive or negative impacts on innovation, and without formalised instances to discuss them. These situations are not exclusively present in the South; there, however, they often represent main trends. The NIS concept was proposed to capture what was going in highly industrialised countries; it is "ex-post" in relation to them. Given that it is hardly discernable as a systemic innovative behaviour in developing countries, it has been suggested that NIS is an ex-ante concept (Arocena and Sutz 2000*b*).

The principal consequence of this state of affairs is that actors of innovation are left to their own initiatives to start relationships. User-producer interactions occur, but slowly, without much chance of displaying "demonstration effects", often too weak to completely accomplish their goals, even more often "encapsulated" in their first interaction and without further diffusion: truncated processes of innovation diffusion appear as a result. This means that the cost of organising interactive learning spaces is high, and that the probability of their appearance is low. Thus, opportunities to find jobs where knowledge creation is demanded are scarce, at least outside the academic realm; neither are academia-industry relations strong. The mismatch between people able to produce knowledge and the demand they face tends to be high, and as a consequence brain drain is stimulated.

When NIS do not in fact exist, there may be a strong temptation to adopt a model and declare the will to build it, but the NIS approach strongly discourages this idea (Edquist 1997). However, it is one thing to reject the idea of NIS "models" that should serve as institutional benchmarks regardless of the context, and quite another to fail to recognise that some features of NIS are intimately related to social goals that are extremely important everywhere. This means that the concept of NIS carries a normative weight.

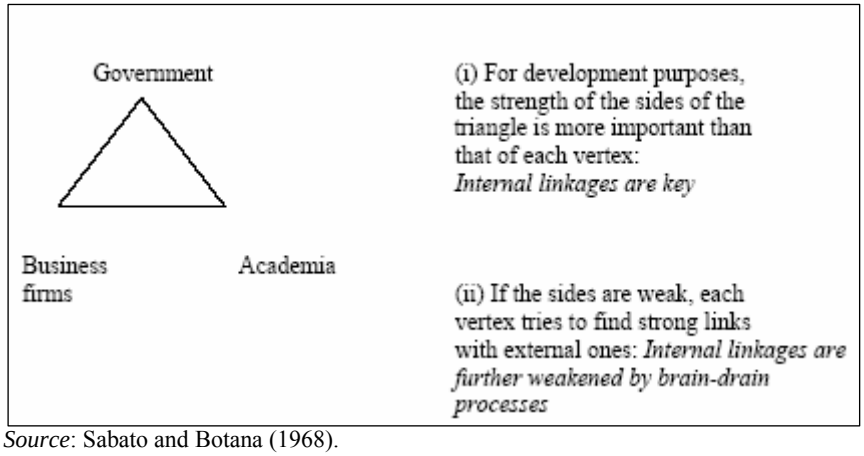
For example, the good economic performance of some small economies without a strong specialisation in high technology has been linked to social capital (Lundvall 2002). This connection deserves great attention in the South. Social capital "refers to features of social organisation, such as trust, norms, and networks, that can improve the efficiency of society by facilitating coordinated actions"; while stocks of social capital "tend to be self-reinforcing and cumulative", the scarcity of these stocks tend to vicious circles that also are self-reinforcing (Putnam 1993: 167, 177).

Policies in underdevelopment inspired by the aim of enhancing social capital should lead, in the realm of innovation, to system-like behaviour. This is so because an enhancement of social capital occurs where people build mutual trust and understanding in the process of solving problems, that is, in interactive learning spaces. The normative orientation of NIS in underdevelopment calls for special attention to be paid to the protection and strengthening of such spaces, and to the articulation of isolated actors to help new ones to appear. This in turn, as already suggested, can strengthen the "brain-retention" capacity of a country.

Viewed from the South, the normative weight of the NIS approach points to the key issue of interactions, of linkages, that is, to the relational aspect of the process of innovation.

The emphasis on interactions is a key feature of the NIS approach; it is perhaps its most distinctive feature, particularly when differentiating it from the "lineal model" of innovation, which conceptualises the whole process as a series of isolated and consecutive steps starting with basic science and ending with innovation. The issue of linkages has been already highlighted in relation to development processes: "The linkages capture much of the development story (because) development is essentially the record of how one thing leads to another, and the linkages are that record" (Hirschman 1981: 75) Linkages are the key to systemic behaviour because a "linkage exists whenever an ongoing activity gives rise to economic or other pressures that lead to the taking up of a new activity" (76). The connection between the weakness of internal linkages and brain-drain phenomena was forcefully suggested some decades ago by Jorge Sabato. The Argentine researcher proposed a concept widely used in Latin American reflection on science and technology policy: the "Sabato Triangle" of relations between government, businesses and academia, able to transform knowledge into a developmental tool (Sabato and Botana 1968). Figure 3 shows Sabato's two main assertions regarding the triangle:

Figure 3: The "Sabato Triangle"



Source: Sabato and Botana (1968).

Stronger and better articulated NIS imply directly that the sides of the Sabato triangle will be stronger. Probably the external linkages of each vertex will continue to be strong, an important feature in a globalising world economy, but the main point is that the internal linkages will also be stronger, thus acting as potential "brain-retaining" mechanisms.

A further feature that needs to be incorporated in the NIS approach from a Southern perspective is that of conflict. Interactive learning and innovation are not necessarily a purely positive sum game. This is true everywhere and has been explicitly acknowledged long ago: Schumpeter's hurricanes of creative destruction imply that, in many cases, while some actors will gain with innovation, others will lose.[1] In underdevelopment, though, rather than creative destruction we usually find destructive creation. This occurs, for example, when something new is introduced in a given society without making use of its accumulated competences, so opportunities to learn are neglected and existing interactive learning spaces may even be closed. This can be understood as a delearning process, and it is a powerful brain-drain driver: why stay in a place where modernity is introduced without allowing participation when there is plenty of opportunity abroad to become creatively involved with it? Destructive creation as a major social trend in underdevelopment is, in part, the outcome of conflicts around the conceptualisation of innovation and its role in development processes. In such conflicts, those who understand that innovation is an endogenous interactive learning process should be promoted. Otherwise in the consequent fight to open interactive learning spaces they will have substantially less power than those concerned mainly with accessing the results of innovations already achieved elsewhere. NIS structures reflect this, in what exists and what is missing, and in what is strong and what is weak. The analysis of NIS as shaped by conflicts in the knowledge/power dimension can help to identify obstacles to articulate coherent actions to foster innovation, competence building and competence retention.

Finally, policies inspired by the NIS approach can be particularly well adapted to a specific national situation, especially because they focus on the relations between actors and how to make them stronger and more effective. In this sense, policies devoted to halt brain drain and to foster brain rearticulation can properly be seen as directly inspired by such a concept.

Innovation as seen through the NIS approach and from the South helps us to understand the issue of qualified migration, as Table 1 attempts to summarise.

Note that the consequences depicted in the last column help to explain both why skilled people are migrating from Southern countries and why skilled migrants are not even thinking of returning or of articulating efforts with their homeland. Learning prospects, that is, prospects for enhancing capabilities by applying competences creatively in problem-solving, are a key element in skilled people's

[1] Joseph Schumpeter (1883–1950), economist and sociologist known for his theories of capitalist development and business cycles.

decisions about where to live. This is a major reason why weak NIS foster brain drain and hamper the many different ways in which it can be attenuated.

Table 1: Some Characteristics and Consequences of Innovation as Seen from the South

Characteristics of innovation in the South highlighted by the NIS approach	**Consequences for innovation and for NIS**	**Consequences for competence-building and competence preservation**
Weak institutional fabric for innovation; weak institutional connectedness	Weak and fragmented NIS	Skilled people find difficulty in applying knowledge creatively and in enhancing their learning capabilities Translation of problem-solving capacities into innovation and business competences hampered by a weak "innovative ambience" Skilled people are frustrated by lack of opportunity to further develop their competences and to collaborate in national development
Truncated processes of diffusion of innovations	"Encapsulated innovations"; weak transforming impact of innovations	
Lack of social capital; low level of trust	Difficulties in the emergence and consolidation of interactive learning spaces	
Processes of destructive creation; conflicting perceptions of the role of innovation in development	De-learning processes; "innovative frustration"; short-sighted innovation-related policies	
Weak capabilities for innovation in policy design and implementation	Frequent inadequate "copy and paste" of "model" policies; inefficient policy implementation	

Source: Arocena and Sutz (2005).

3. Empowering NIS to Halt Brain Drain and Brain Rearticulation

A recent paper, already quoted, states that "anecdotal evidence reveals that skilled migration is a fast-evolving process which is likely to further accelerate in the coming decades as a part of the global transformation affecting the world economy" (Docquier et al. 2005: 16). At the same time, the following assertion indicates that trying to influence this trend is far from easy for developing countries: "the hard reality is that few emerging markets have any hope, in the foreseeable

future, of creating the type and volume of economic opportunities [needed] to reverse or even to substantially slow the brain drain" (Devan and Tewari 2001, quoted in Wickramasekara 2002).

Without proposing in any way that empowering the Innovation System of a developing country is either the only or the main strategy for halting brain drain and fostering brain rearticulation, it can be argued that it is a path towards that aim. In particular, it should be stressed that if skilled migration is a lasting phenomenon, the evolution towards a knowledge-based and innovation-driven globalised economy in the midst of huge asymmetries in terms of knowledge and innovation capacities may further fuel such phenomena. Strategies directed towards opening and sustaining national opportunities so that skilled people can have more satisfactory working lives are thus important. Empowering NIS can address this issue both directly and indirectly.

Examples of direct policy measures that strengthen NIS while fostering brain rearticulation include financing local sabbatical stays for researchers living abroad as well as short courses or workshops. To devote scarce resources to them requires recognition of the importance of the measure in the first place; together with a great effort of identification, organisation and articulation. Putting these measures in place under the realm of science, technology and innovation policies can help to visualise them as part of a broader effort, thus adding to their legitimacy and sustainability. An example of a less direct policy measure relates to the tension between the need to send young people abroad to acquire advanced knowledge at postgraduate level and the possibility that they will not return because what they have learned is of little use or difficult to pursue at home. No isolated policy measure can deal with this tension, but science and technology policies supporting "sandwich" fellowships so that students can stay abroad for several years without losing touch with their own country can help to diminish it. In particular, such contacts may allow the student's research agenda, always heavily moulded by the interests of their mentor abroad, to be biased towards issues of local importance.

Some other ways of empowering NIS may be seen as rather indirect regarding brain drain and brain rearticulation; they can, however, by opening up new avenues for interactive learning spaces, also open up intellectually challenging working opportunities. Many "classical" innovation policy measures could be mentioned: helping firms become more innovative includes lowering the burden of hiring skilled people; supporting through different mechanisms the development of science-based start-ups implies that entrepreneurial young people will find a place to stay in their own country. Other measures may be rather heterodox for a science, technology and innovation policy, but they can nevertheless be particularly well adapted to a developing country. For example, a programme on linking innovation efforts to the more pressing problems of the deprived population – housing, nutrition, health, communication, education – that is, an innovation policy conceived as part of social policies, can have great political legitimacy and so enjoy a more sustained effort from governments, avoiding the usual stop-go type of

innovation policy so common in underdevelopment. Even if the material working conditions of researchers and other skilled people may not improve substantially through a programme of this type, at least difficult and meaningful developmental challenges can be put forward and supported. Addressing such challenges can justify staying for many skilled people; if the work is well organised, it can possibly foster different ways of rearticulation.

Empowering NIS also needs to work around cultural issues. Policies directed to this aspect can be seen as having an indirect effect on skilled migration. For example, it is hardly possible to have a strong NIS if it is not believed that many people within the country are able to produce knowledge and to use it creatively to solve problems. To show that such people exist and to diffuse what they have done can help cultural change in a developing country, one consequence of which would be to weaken the idea that to be able to do well in science, technology and innovation the only way is to emigrate.

Table 2 summarises a few policy instruments inspired by the NIS approach that, combined, could make a partial contribution to brain retention or brain rearticulation.

Table 2: Some Policy Instruments with a Possible Positive Impact on Brain Retention and Brain Rearticulation

Policy instruments	**Rationale of the instrument from a brain-drain perspective**
Connection with the skills diaspora	Scientists and technologists abroad should be helped to spend sabbatical or shorter stays in their home country
"Sandwich" postgraduate studies	Young people must study abroad, but they need to maintain intellectual contact with their country and work on problems of interest there
Identification of social demands for science, technology and innovation; assuring that such demands have concrete possibilities of fulfilment	Social problems can be transformed by a huge demand for scientific, technological and innovative efforts, inside and outside the country, providing a deep sense of useful involvement
Divulging national science, technology and innovation achievements	Self-defeating technological opinions are brain-drain drivers through the self-fulfilling prophecy, "we do not believe we can, we do not try, we cannot"; awareness of national capabilities are needed to reverse them

Source: Arocena and Sutz (2005).

4. Conclusion: on Transnational Innovation and Development Strategies

Sabato's assertion about underdevelopment being characterised by weak internal linkages giving rise to "closing the triangle" of research, business and government through external interactions continues to be true. An outstanding example of such phenomena is high-skilled migration. First, because in developing countries such linkages are structurally weak even today; second, because international demand for skilled people from developing countries has been growing and several factors have made it easier to interact worldwide.

We have tried to show that weak National Innovation Systems have expulsive consequences for skilled people, hampering at the same time rearticulation prospects. This is so not only because of the weakness of innovation systems at national level, but also because of the growing strengths of innovation systems emerging at transnational level , the case of ICT being particularly notorious.

The effect of such "Transnational Innovation Systems" on the interplay between weak National Innovation Systems and brain drain is not easy to disentangle. By providing opportunities and incentives to join such systems, they act as classical brain-drain drivers. But Transnational Innovation Systems, at least some of them – such as those devoted to problems of public health – can also foster global knowledge networks where a researcher from a developing country can join without migrating.

Even if in this last case the outcome is positive, it is nevertheless of an individual type. A key issue is whether the main problems of underdeveloped regions find a relevant place in the research agenda of transnational research communities. For collective benefits in the South to flourish from innovation, that is, for development purposes, keeping skilled people at home and encouraging those abroad to join local efforts must be coupled with National Innovation Systems able to drive research agendas and innovative actors towards the pursuit of social goals. Transnational Innovation Systems can be a fundamental tool for brain formation and brain rearticulation at local level, but only if they are strong enough to provide a home for creative people.

One of the most illuminating emphasis of innovation scholars – on users – converges with development thinking in several ways, particularly with Sen's recommendation about seeing people as agents and not as patients (Sen 2000). Enhancing people as agents needs stronger and less incomplete NIS; such enhanced agency will then include the possibility, for many skilled people, of being useful for the development of their countries both at home and abroad.

Note

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Circulation of Competencies and Dynamics of Regional Production Systems*

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As borders become more open, regional production systems (RPSs) are tending to become increasingly specialised. In any given sector, two or three cities or regions compete on a global scale while other systems disappear. The specialised RPSs concentrate the know-how, the knowledge, the major companies, and the most important research and training institutions relating to a given sector. As capital moves around freely between these various spaces, labour and competencies are increasingly described as the main anchoring factors of these activities. Many authors speak of the existence of specific know-how, or of a specialised labour market. Consequently, what role do migrations play? In the post-war "Fordist" period, migrations above all provided cheap labour for the industries of northern countries. Today, the profile of migrations has diversified considerably. They are located at the two extremes of the pyramid of competencies. Our hypothesis is that movements of highly qualified labour play a determining role in the renewal of those RPSs that are competitive on a global scale. This paper considers in parallel the historical evolution of three Swiss production systems representative of current transformations (watch industry, micro-technologies, advertising/marketing) and the evolution of migrants' competencies. Based on empirical surveys, the link between these evolutions is examined, in particular from the point of view of innovation and structural change. Our assumption is that migrations can be the driving force behind the dynamics of knowledge and competence. Consequently, the insertion of migrants and the various ways in which this integration takes place in the workplace becomes the central question. A typology of the relations between the insertion of migrants and regional industrial dynamics is built up, ranging from rigidified productive structures to the creation of new competencies and new economic activities.

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Increased competition on a global scale is deepening the spatial division of labour in two directions. On the one hand there is a more profound traditional, functional, "vertical" spatial division of labour (Massey 1995) between central regions or nations with high wage levels and peripheral regions or nations with low wage levels. On the other, there is also a more marked "horizontal", competitive spatial division of labour, i.e. a progressive differentiation between regions in terms of evolving blocks of specific competencies (Perrat 2005; Storper 1992).

This paper focuses on the second phenomenon. In any given sector, the reorganisation of production systems reveals a tendency to adopt a form of global competition between two or three regions or cities. These regions or cities concentrate competencies, major companies and research institutions within a particular sector. As capital circulates more or less freely between these various poles as a result of the development of the financial industry, labour and competence increasingly appear as the most decisive anchoring elements for internationally competitive production systems. Various authors have advanced explanations for this: the existence of specific types of skills and resources at the regional scale (Colletis and Pecqueur 1995; Crevoisier et al. 1996; Le Boterf 1995), the existence of a market for specialised labour in industrial districts (Becattini 1992; Garofoli 1992) or in "global cities" (Sassen 1991), etc.

If labour and competencies are now decisive anchoring factors, what is the role of migrations? Within the "Fordist" system of the post-war years, migrations above all made it possible to provide a cheap labour force for rapidly developing countries in Northern Europe. Today, the profile of migrants has diversified considerably. These people are now situated at both extremes of the qualifications pyramid and it is necessary, for the most qualified, to shift from the paradigm of allocation to the paradigm of the circulation of competencies (Nedelcu 2004).

Our hypothesis is that migrations play an essential role in maintaining competitiveness among regional production systems (RPSs). This impact can be described along two axes. First, there is a diversification of the contemporary forms of anchoring migrants in the RPS, and second, the impact depends on the way in which competencies circulate.

The first part of the paper forms a conceptual framework revealing the circulation and anchoring of competencies. We show, in particular, that the traditional approaches oriented towards mobility of the factors only apply to special cases, and that these are not conducive to understanding today's transformation within migratory flows. This typology, although presented at the beginning, in fact emerged during the research. It should therefore be considered as a result of the confrontation between empirical findings and conceptual work during all the research and not as an *a priori* intellectual construct.

In the second part, we draw parallels, using survey data from the historical evolution of three RPSs in Switzerland (watchmaking, micro-technology and

publicity/marketing) on the one hand, and from the evolution relating to ways in which competencies circulate and migrants become integrated, on the other. These three sectors are representative of current changes within production systems. In fact, watchmaking mobilises both traditional areas (marketing, design, etc.) and new ones, thus bringing it closer to the model of industrial districts; micro-technology is evolving rapidly thanks to developing technologies, and evolving in forms modelled on techno-poles; finally, publicity and marketing activities are characteristic of metropolitan systems.

In the third part, we synthesise the results obtained in order to reveal the relation between the circulation of competencies and the dynamics of RPSs in the form of a table. We notably discuss these results in relation to the local system of training and research.

Finally, in conclusion, we return to the necessity of moving from the paradigm of mobility and localisation to that of the circulation and anchoring of competencies, in order to develop new theories on migrations and on regional development.

1. Circulation of Competencies and Regional Anchoring

1.1. Two approaches to regional development

Today, we can pinpoint two major models of regional development that correspond to two approaches to migrations.

On the one hand, there is development based on the attractiveness of the region for companies, labour and capital. Attractiveness is characterised by localisation factors. This approach, based on the *mobility* and the *localisation* of production factors, has dominated economic study of migrations to date. In this perspective, development takes place because a source region presents characteristics that are inferior to those of a target region, whether in terms of salary or availability of employment. Migration thus appears as the *correction of an imbalance* that is essentially *quantitative.* In fact, moving to one area from another reduces the differences between factors that take the same form (salary level for example), but have different values depending on the area.

On the other hand, regional development can be seen as the *transformation* of an RPS thanks to *innovation*. Competitiveness on a global level is acquired by developing *regional production systems* specialising in a certain sector, technique or type of product or service. These RPSs do not maintain their advantage thanks to lower costs, but rather thanks to their capacity for making their specialised competencies evolve dynamically and autonomously (following their own logic) as a result of integrating new knowledge. In such a perspective, migrations are not seen as correcting an imbalance between a source and target region. Migration makes it possible to *maintain the competitiveness and coherence of an RPS*, while

allowing competencies to circulate, combine and develop because they confront one another. It is thus the *qualitative* articulation that becomes the decisive factor. To grasp this aspect, the notion of *competence*[1] becomes a central issue. In fact, in an environment that is becoming more and more uncertain, the technical division of labour that has characterised production within most industrial sectors for fifty years is showing a tendency to be replaced by a *cognitive* division of labour. Companies are favouring the constitution of coherent units that place the emphasis on competencies. "Through this modification to the nature of the company's activities, it is the very principal on which the division of labour is based that is renewed. The principle of the division of labour thus appears to be in the process of sliding from a logic of technology and yield towards a logic of competencies and apprenticeship" (Moati and Mouhoud 1994: 52). Thus, the dynamics of companies generate new needs for competency or call for a recomposition of the available competencies (Flynn 1993). This transformation is even more evident within activities that are considerably exposed to technological changes. To date, very little research has been done in order to understand how RPSs identify and mobilise competencies that have been developed elsewhere. Most research emphasises the specific characteristics of local know-how (such as in the industrial district approach) or the coherence between the training/research system and the companies (on the model of "techno-poles").

1.2. Typology linking the circulation of competencies and regional development

In this section, these two approaches to regional development and migrations (quantitative in terms of costs and qualitative in terms of anchoring competencies) are combined in order to construct a typology of forms of anchoring and mobility.

It is worth noting here that this typology was drawn up during the research, in parallel with fieldwork. It is not the result of abstract theoretical thinking. Short examples are provided for each of the cases. Nevertheless, as it hinges largely on knowledge of the case studies, the typology can only be fully understood when referring to the empirical research, of which various examples are provided.

Tarrius (1996; 2001) developed the notion of circulatory territories in order to show the diversity of forms of mobility and of migrants' relations with the different places through which they circulate. Starting from that notion, we describe the complex contribution of migrants to regional and local development with two narrowly linked processes. *Circulation*, on the one hand, characterises the movement of people and of their competencies from a source region towards a target region. *Anchoring,* on the other, is the way in which these people will become inserted within the firms that hire them. To give an example, certain

[1] Competence is a pertinent combination of formalised knowledge, techniques, know-how, attitudes (for example the knowledge of practices within a specific professional milieu), intuition, reflexes and habits. Competencies can exist only in an active way, as they are linked to activities, and "in situ", i.e. within a specific local working context.

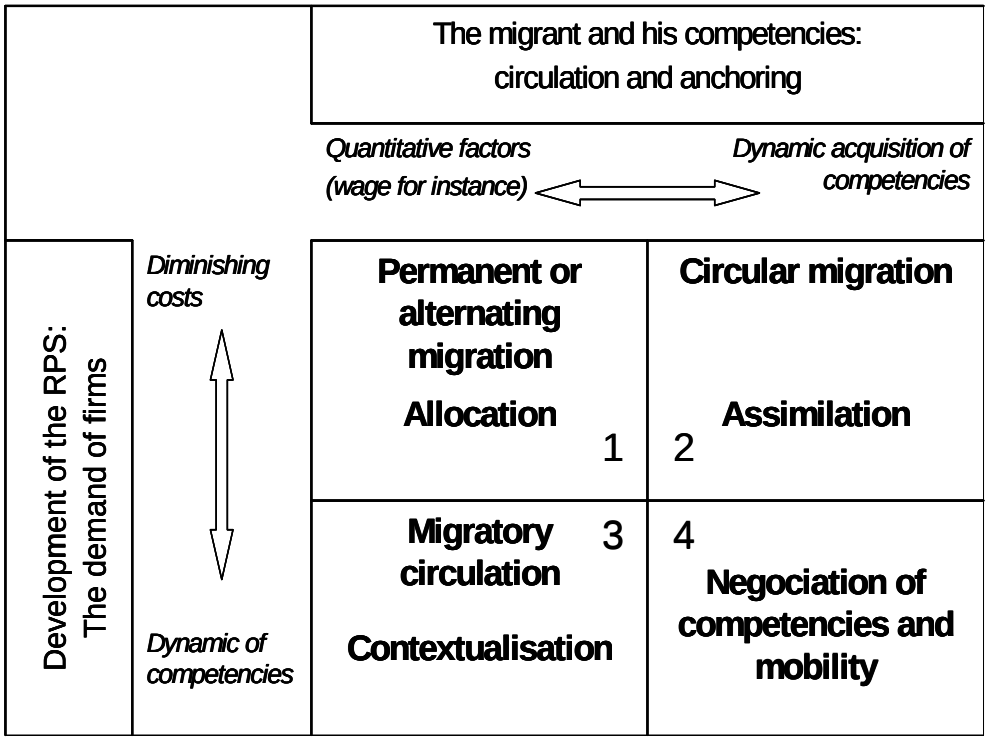
migration movements can be explained essentially in terms of wage differentials. Circulation and anchoring here will be very different from those movements caused mainly by the perspective of improving the competencies of individuals or of the job providers. In the first case, variations in wages may provoke the reverse movement. Anchoring will be weak. In the second case, anchoring will depend on learning processes. Understanding migrations also implies an understanding of the different modalities of circulation and of the anchoring of competencies (Figure 1) that characterise the relation between one migrant and the RPS that receives him or her. In a schematic way, we oppose *quantitative motives* (mainly wages and costs) to *qualitative motives* (learning and development of competencies) for circulation and anchoring.

Migration moreover consists of an encounter between an *individual* and a position offered by a *firm*.

From the viewpoint of the individual who changes location, is migration linked to the acquisition of new professional competencies, or is it mainly motivated by wage considerations? The *horizontal axis* makes this distinction. In general terms, two distinct consequences can be expected within an individual professional migration. Either it allows an individual to obtain a salary that is more interesting than that of the source region (because the employment possibilities or the salary rates are better in the target region), or the migration is considered to be "professionally beneficial", i.e. it offers the migrant new areas of competency. The quantitative aspect of the question, consisting of asking what is the salary differential induced by mobility, offers only a limited explanation and represents one of the extremities of the individual axis.

From the point of view of firms, and more generally of the target RPS, is the aim to associate specific competencies in order to adapt to technological and market developments, or rather to reduce costs thanks to an immigrant labour force cheaper than that obtained locally? The *vertical axis* takes this question into account. On the one hand, the company strategy mainly consists of cutting its costs in order to remain competitive. Schematically, such strategies may be thought to rely on the production of stable goods and techniques, few organisational changes, few innovations and little learning. Hiring immigrant workers, which is less expensive than hiring locals, makes it possible to achieve this. On the other hand, the strategy of a firm can be oriented towards differentiation and learning in order to stay competitive. In such a case, innovation is crucial and it is necessary to integrate new competencies in technologies and products. Hiring migrants who will bring new and/or specific competencies may help in this respect. It is then possible to distinguish four cases.

Figure 1: Typology of Modalities of Circulation and Anchoring of Competencies within an RPS



Source: Authors' elaboration.

1.3. Allocation of competencies by cost: permanent or alternating migration (Case 1)

The first case presents instantaneous adaptation. The immigrant is first of all defined as having to adapt to an existing position, a little like a piece in a jigsaw puzzle. If such jobs are more often than not intended for unqualified workers, an identical form of anchoring can also exist for those who are more highly qualified. The transfer of competencies that are recognised or implemented within the source context into a post-migratory context depends on the technical and cultural proximity of the pre- and post-migratory contexts. Following this logic, the company does not seek to acquire competencies, but merely to make efficient use of the competencies available from the labour force working there. In such cases, where the anchoring factor is the cost, we speak of *allocating* competencies.

From the viewpoint of geographical and professional mobility, this allocation corresponds to permanent migration, or at least alternating migration (i.e. more or less regularly repeated migrations from the same source region towards the same target region). Seasonal workers are included in this category, because most immigrants who arrived in the Swiss labour market between 1950 and 1970 are

seasonal workers who later settled in the country. This type of geographical mobility, i.e. a "one-way ticket", corresponds to the great majority of those who came to work in Switzerland, and has been the case for approximately thirty years.[2] It is a form of migration largely determined by the levels or conditions of work between the source and target regions.

The profile of those who migrate is thus typical of what is usually termed "immigrants" within European countries.

1.4. Acquisition of competencies: circular migration (Case 2)

In the second case, awareness of immigrant status may lead individuals to bring about a repositioning in companies of the target region. Immigrants, if they are capable, may use a strategy of *acquiring local competencies* at the workplace or within training institutions. In the same way, if they are capable of distancing themselves from their immigrant status, they can play on their "difference" to set in motion, or create, competencies that would not have been recognised as such in the pre-migratory context (unremarkable in the source context and rare in the target context, such as linguistic competencies). In this second case, linguistic or other home-grown competencies can be mobilised by immigrants to participate directly in defining "competency". For them, this case corresponds to a form of professional *assimilation*, a process at the end of which the competencies of the migrant totally fit within the local mix, even if some components of those competencies issue from the context of origin.

From the immigrants' point of view, this case represents a geographical and professional mobility oriented towards qualification: the objective is to acquire new competencies (usually readily available in the labour market of the target region) in order to return and capitalise on these in the source region (where these competencies are supposedly considerably less easy to find and thus constitute an advantage to those who master them). This kind of mobility includes a circuit followed by migrants in order to develop their competencies and eventually return to their region of origin. In opposition to a simplistic treatment of permanent migrations, which was often considered from an economic point of view as a total break with the country of origin, such migratory movements are increasingly known as *circular migration* (Dupont and Dureau 1994), or *brain circulation* (Gaillard and Gaillard 1997; 1998).

1.5. Contextualisation of competencies: migratory circulation (Case 3)

The third case – that of *contextualisation* of the competencies of migrants within the target firm - is different to the first two in that it is the company that evolves and seeks out *specific competencies* among migrants. The company, under pressure

[2] Even if alternating migration has been long maintained by migratory policy in order to restrict direct immigration (seasonal worker status, type A work permit), the automatic conversion of seasonal A permits into annual B permits constituted the basis of permanent migrations.

from the environment, becomes specialised and evolves according to blocks of knowledge centred around competencies. To do so, it seeks out competencies that are rare or non-existent locally at certain times. Migrants bring such competencies with them, and these competencies are implemented, and contextualised, within the company. The anchoring factor of the migrant is thus the diffusion of individual competencies in the target context. However, although these competencies may correspond to what the employer is seeking at a given moment, nothing makes it possible to affirm that this situation is stable. In such a case, an employer may recruit someone with the competencies of interest, and may break the relationship rapidly if markets and technologies change.

Migratory circulation characterises the migrant with rare professional competencies, and who moves from one company to another depending on the needs of employers. This case corresponds to "transient" migrations (Findlay 1993) or migrations with a dynamic migratory space (De Tapia 1996; Dorai et al. 1998) or also what Gaillard and Gaillard (1997) termed "brain circulation". These are generally highly qualified migrants who move about within an international network of competencies, depending on the needs of the companies within this same network. They are usually *specialists* who possess rare competencies, or management-level employees within large concerns who are moved to affiliates abroad.

1.6. Negotiation of competencies and mobility (Case 4)

The fourth case deals with the principle of *negotiating competency and mobility*. In a changing environment made up of blocks of specialised knowledge, immigrants must constantly adapt their competencies. Here, notions of distancing and instrumentalisation take on their full dimension from both the immigrants' point of view and that of the company. Note that this rarely takes place on recruitment, but is more often the result of an evolution within working relations.

Negotiated mobility describes cases in which both immigrants and the professional context in which they exist draw benefit from mobility. Cases linked to internal migrations within a company may enter into this category (see, for example, Pierre 2003). Within large companies whose labour force is present in several countries or even on several continents, international migration may form part of a career plan negotiated between employee and employer. Mobility is negotiated and controlled by the company. It allows individuals to improve their competencies by gradually gaining access to various positions within the group employing them. Such career paths may also take place among different companies, where the person concerned follows a strategy for acquiring competencies within an international network of companies active in similar sectors. Note that in this type of case, migration is rarely permanent: it is part of what we shall call an "individual training circuit", a little like circuit training within sport. The objective is to test the individual's competencies by favouring the acquisition of new competencies. This method used

by companies is fruitful for individuals: and by confronting those in new situations, it contributes towards developing their professional experience.

To summarise, this typology takes into consideration new forms of anchoring and of the circulation of competencies, while integrating the traditional forms of migration. In fact, in Case 1, the approach to the phenomenon is based on a characterisation of the allocation of competencies, and is restricted to noting whether there is a correlation between supply and demand for competencies at a precise point in time. The three other cases bring new dimensions to the subject. First, they bear in mind the *dynamic* process of anchoring individuals by the company, or of the individual's acquisition of competencies. This dynamic aspect also takes into consideration the various temporal aspects of circulating competencies, ranging from brief stays to permanent migration. Second, this typology stresses the difference between quantitative anchoring (as a result of costs or salary) and qualitative anchoring (innovation and the acquisition of competencies). *We can thus understand not only how migrations can correct certain imbalances in the labour market, but also the way in which the circulation of competencies allows regional production systems to acquire the competencies that are crucial for their adaptation to changes within technologies and in the markets.*

2. Changes within Three Regional Production Systems

This section applies the typology developed above to three RPSs in western Switzerland: watchmaking, micro-technology and communication. These three sectors have the advantage of covering a large extent of the current economic changes taking place. In fact, watchmaking mobilises both traditional areas of competency (micro-mechanics) and newer ones (marketing, design, etc.), thus bringing it closer to the model of industrial districts. However, after a period of major innovative activity, this system has been progressively integrated within international groups. Micro-technology is a relatively new industry that is evolving rapidly along with changes in technology. These activities are mainly developing from training and research centres, on the techno-pole model. Finally, and under the heading "communication", we group together publicity, marketing and design activities. These services are relevant to numerous sectors of activity, and are characteristic of metropolitan systems.

The empirical part of the study is based on several research projects carried out by the same research group at different periods. The first was a survey on the integration of migrants in small and medium firms and their impact on innovation (Berset et al. 2000). It concerned the watch industry, the micro-technologies industry and communication services, and consisted of interviewing migrants about how their lives and jobs developed over time, how their competencies evolved and how they became integrated within their present position. Complementary interviews were systematically carried out with managers of the same firm in order to understand the links between, on the one hand, migrants and their competencies

and, on the other, innovation and changes in the firm. Moreover, demands were made about the perception and eventually company policy towards these competencies. In total, seventy-four interviews were held. Other older surveys about the transformation of the same RPSs in Switzerland, carried out by the same authors, are also used. The most important one was dedicated to the dynamics of competencies in industry (Crevoisier et al. 1996). Approximately one-quarter of the interviews made within this survey nearly ten years previously had immigrants as their subjects. Other research works were devoted to gaining a more general understanding of the evolution of production systems (Corroleur et al. 2000; Crevoisier 1993*b*), thanks to which it became possible to establish links between micro-observations made within firms and regional dynamics.

2.1. Watchmaking between 1950 and 1970: the "immigrants" lead to more rigid production structures

2.1.1. Structural evolution

Between 1950 and 1970, the general context was one of stability in products and technology, of ongoing growth in demand, and of a labour force shortage. New arrivals in companies started at the bottom rung of the ladder, carrying out simple tasks for which a maximum of a few weeks' training was necessary. Their competencies were those inherent to the position they held, internal to the company and handed down in a hierarchic way by the workshop foreman.

2.1.2. Forms of insertion for migrants: the "immigrants"

The "immigrants" were set to work in standardised jobs, and the competencies they required were handed down by their hierarchic superiors within the company. The possibility of taking on foreign workers, basically from Italy and Spain, allowed the companies and their production levels to grow. This led to a marked drop in average qualifications, and to the organisation of work becoming more rigid.

The work was mainly unskilled and required few qualifications. The individuals within this category thus conformed to productive structures marked by great stability. Their insertion mainly concerned linguistic and cultural adaptation within a working team where the objective was the homogeneity of its components and attitudes. What counted even more was adapting to "in-house" production methods that could only be acquired within a given company.

2.1.3. Forms of mobility: permanent migration

In the case of Switzerland, the vast majority of those sharing this type of professional insertion are nationals from Latin countries (i.e. Italy, Spain and Portugal) who, after migrating, took the decision to settle in the target region for a long period, at least until their retirement. Given this past or present project to become permanently settled, the migrants' desire to become integrated was strong

in both social and professional spheres. Adaptation responded to a professional obligation, while also taking on a strategic dimension, i.e. that of the learning of a language and behavioural norms: assimilating them was considered to be a socio-professional investment.

Most such immigrants were unskilled workers. At the outset, it was mainly men who immigrated, but over time, a certain stabilisation of this population took place. Reuniting families in Switzerland also allowed the mobilisation of a female labour force. This migration – initially seen as temporary – thus became permanent.

Immigrants active in watchmaking are relatively numerous (approximately 40 per cent of the labour force). Most of them arrived in Switzerland without any training in the watchmaking sector, but found work there and received their training "on the job". Geographical migration, and the constraints linked to an unfavourable economic environment in the source region, preceded professional mobility.

2.1.4. Impact of migration: more rigid structures develop

During the 1960s, the watchmaking RPSs became increasingly organised and rigid. This led to rapid standardisation, an increase in the division of labour and, above all, a marked decline in workers' qualifications. Until 1970, recruiting foreign workers made it possible for companies to grow. However, this growth led to the *productive structures becoming more rigid:* the low cost of foreign labour favoured postponing the time during which new investments should have been made. In fact, it was less costly in the short term to handle an increase in growth by hiring workers than it was to invest in more efficient equipment. In the long term, however, this facility became a trap and led to the industry falling behind the times on a technological level.

2.2. Watchmaking between 1982 and 1990: the "specialists" create new markets

2.2.1. Structural evolution

During the 1980s, watchmaking first underwent a major crisis and then a repositioning in the market, thanks to the development of products linked to fashion and luxury. From a product that told the time, a watch became a status symbol. This change, which made it possible to save the industry and then to make Swiss watchmaking successful, took place via the integration of competencies in the areas of marketing, design and communication: aspects that had hitherto been absent within the region and the sector. From this point on, it was the market and customer relations that dictated the products, technologies and working methods, including production workshops. The change in perspective was considerable.

2.2.2. Forms of insertion of migrants: the "specialists"

The absence, or in any case the insufficient amount of competencies in design, communication and marketing in the watchmaking RPS was to heighten the need for foreign specialists, who would bring with them not only technical competencies but also an awareness of consumer requirements in the major export markets. In addition, the innumerable different styles, technologies and materials used – that characterised the sector – called for foreign technical specialists at various points in time.

2.2.3. Forms of mobility: "migratory circulation"

Watchmaking companies called upon numerous specialised competencies in the areas that they did not master and that were lacking or rare within the region. At the outset, anyway, this was a case of migratory circulation in the sense that calling upon these specialists only took place at certain times: for example when setting up a publicity campaign, designing a new collection, or introducing techniques for working a particular material. With time a certain number of these competencies, although not needed regularly, nevertheless became central to the development of the RPS. This was particularly true for design and for publicity and marketing. The development led to a certain number of foreign specialists settling in the region, meaning that the migration of such experts became permanent.

2.2.4. Impact of migrations: creation of new markets

The contribution of new competencies and the linking of these to existing know-know took place partly as a result of immigrating specialists in these sectors. The possibility of attracting these competencies, plus the interest shown by these specialists in the watchmaking sector as it deployed its activities, meant that this RPS could be reorganised to a considerable extent. The change in the sector's activities required linking up with international networks in the sectors of design, publicity and marketing, with which the region had had no connections in the past. On the production side, the circulation of competencies led to rapid access to very diverse technologies that could create the product in various forms, thus allowing the product to evolve with fashion (as for example the use of different materials).

2.3. Watchmaking since 1990: "trans-nationals" provoke loss of autonomy

2.3.1. Structural evolution

The renewal of the watchmaking industry and the impressive growth in its profits aroused the interest of both national and international investors. If we take the development of the Swatch Group – which bought up numerous watchmaking companies – as an exception, virtually all other companies in the watchmaking industry have been bought by international industrial conglomerates and financiers.

In parallel, the luxury, mechanical segment within watchmaking has developed on the basis of local competencies.

2.3.2. Forms of insertion of migrants

In this context, the profile of the immigrants has once again changed considerably: it is now a question of managers delegated by a concern's headquarters to manage local companies. We could call them "transnationals", i.e. those at director level, heads of departments, etc. with a high level of professional competency in terms of diplomas and experience. The management competencies they bring with them are simply put to work in a local context. They usually have the language of the company headquarters as their working language (French, Italian or English).

In the mechanical, luxury segment, immigrants for whom watchmaking is a passion and who wish to acquire these competencies have come to Switzerland. Their anchoring process took place via a post-migratory training period within the region. Several institutions offer such courses.

2.3.3. Forms of mobility

Managers employed by multinational firms often come from abroad and tend to move on to other regions and countries after a certain number of years. In fact, a period spent in a different country is part of the career path for employees of such concerns. This is migratory circulation in the sense that for those who occupy these positions, the time spent in such an RPS is a phase to be completed before returning to occupy a more senior position at headquarters or in more central regions.

Concerning the immigrants who are attracted by the mechanical, luxury sector of watchmaking, we can speak of circular migration as their primary objective is usually to obtain training in the host region in order to return to their source region. However, for several of those interviewed, this return led to professional failure so they returned and settled permanently in the region.

2.3.4. Impact of migrations: loss of autonomy of subsidiaries of large groups

The impact of the arrival of foreign managers and their competencies within the watchmaking RPS represents a decline in terms of all higher-level, specialised tertiary positions in the region. In fact, management competencies are no longer worked out and dealt with "on the spot", as was the case previously, but are now imported and re-exported without this having any considerable impact on the region. Managers attribute services with high added value (design, marketing, legal advice, etc.) to centralised services or headquarters. This increased spatial division of labour questions the local capacity to develop such new products and technologies. The evolution suggests an increasing and exclusive concentration on manufacturing functions.

Within the luxury, mechanical sector, the fact that the immigrants follow local training has made it possible to reproduce local know-how, for which the demand is extremely high.

2.4. Micro-technology

2.4.1. Structural evolution

Micro-technology can be characterised by the combination of several types of technology, and mainly micro-mechanics, micro-electronics, optics and materials sciences (Maillat et al. 1995). Cameras, sensors of all types, measuring apparatus for numerous types of medical equipment such as endoscopes, etc. are typical micro-technology products. Centred on an evolution of technology rather than a stable ensemble of products, this RPS maintains its competitiveness by combining new technologies resulting from several areas of research (optics, micro-electronics, micro-mechanics, information technology, etc.). Those at the centre of companies within this RPS are above all multi-disciplinary engineers who have followed specially adapted training for this sector, which has evolved rapidly since the beginning of the 1980s because micro-electronics and computer science considerably challenge the traditional RPS of the region centred on micro-mechanics. So-called "micro-technology engineers", able to combine these technologies in order to produce miniaturised and mobile devices, have been trained.

2.4.2. Forms of insertion of migrants: the specialists

However, specialists in areas that are combined – such as advanced micro-electronics – are often recruited abroad. In fact, they cannot be trained "on the spot" because of the small size of the RPS and of the very diversity of these specialities. Their anchoring in the companies and in the region's research centres thus corresponds – at least at the outset – to the integration of new competencies that make it possible for the products and technologies to evolve.

2.4.3. Forms of mobility: migratory, possibly permanent circulation

The recruitment of these specialists is directly carried out abroad, by means of advertisements in specialised publications or via a network of relationships. Individuals thus migrate because of their competencies. They are hired by local companies that at first have relatively precise expectations. However, these expectations evolve considerably if the specialists concerned "make themselves a place" in the company or region. If they do not, they can leave again to offer their competencies elsewhere.

Permanent migration: in micro-technology companies, mobility within both the foreign labour force and that of Switzerland is relatively low. Foreigners hired for competencies that exist locally are generally those with unrestricted work permits,

meaning that geographical migration is, in professional terms, permanent in most cases.

2.4.4. Impact of migrations: development of a combined-type technology industry

The impact of these migrations is considerable in the micro-technology RPS. In fact, this system could not be maintained without the regular renewal of advanced competencies that are combined within the RPS. They therefore have a significant impact on the technologies and products of the company, and thus to some extent they play a contributory role towards the development of such an industry.

2.5. Communication

2.5.1. Structural evolution

Services for publicity, marketing and communication entail numerous competencies that are halfway between the commercial, artistic and information technology professions. Like other services to companies, publicity and marketing underwent appreciable development as of the mid-1980s. It is a sector typical of metropolitan centres. Its competitiveness basically depends on two elements. First, it depends on the attention paid to variations of attitudes among consumers and the capacity to anticipate tastes and fashion. Second, information and communication technology plays an essential role, and this sector is currently undergoing rapid change. Generally speaking, the competencies of individuals play a greater role in structuring this activity than do material investments. The articulation of competencies around coherent companies and production systems is thus meaningful.

2.5.2. Forms of insertion of migrants: acquisition and contextualisation

Keeping an ear to the ground regarding markets often means translating tendencies developing elsewhere into a national context. This *contextualisation* often takes place via the circulation of those active in the major national and international centres for publicity and marketing. This geographical circulation allows them to acquire an awareness of social, cultural and linguistic variations in the market. Regarding the evolution of technology, this sector is a primary user of new information and communications technologies. It is particularly important to be at the "cutting edge" from this point of view. Here, too, circulation makes the rapid *acquisition* of new competencies possible.

2.5.3. Forms of mobility: circular migration

The distinction between permanent migration and circular migration questions many existing notions of migratory and professional projects. These projects are, however, those that generate uncertainty for the researcher, either because a project can be frequently subject to modifications or, at times, because no such project

exists. Migratory circulation, which generates a circulation of competencies, corresponds – for the individual – to a permanent migratory status. This situation remains exceptional within watchmaking and micro-technology, but corresponds fairly well to a certain idea of the mobility of competencies in the communication sector.

Migratory circulation: Mobility is very highly regarded within companies in the communication sector. The creative aspects of professional activity within the sector – even if they are not the most important elements for all types of activity linked to communication – mean that here, mobility is recognised as a strategic competency. In communications, we are dealing with a branch in which competition and competitiveness come into play among all companies in the market, independently of their size. The "quality of the individual" therefore takes on considerable meaning here. Companies therefore attempt to exchange employees, thus allowing a certain circulation of competencies yet without running the risk of losing these individuals.

2.5.4. Impact of migrations

The communication sector cannot function without a significant and international circulation of competencies. At a period when the same products are sold in numerous countries, communication makes it possible to adapt them to the characteristics of local consumers. In this context, migration cannot be dissociated from the sector's evolution. It is by migration that innovation takes place. Innovation consists of translating competencies developed elsewhere into a local context.

3. Circulation of Competencies and Regional Dynamics

The changing RPS and the forms of circulation and anchoring described in the previous section can now be synthesised. This study shows that it is possible to establish a relationship between these two variables (Table 1). A connection thus exists between the evolution of the RPS and the forms of circulation of competencies encountered therein. We do not know whether or not these forms of mobility have reinforced the competitiveness of these systems. In fact, an RPS calling upon a migrant labour force can be considered either as a mark of dynamism or as a means of avoiding more difficult problems such as investing in the workforce. Two examples illustrate these points: one can be seen in the way that an RPS is influenced by migrations; the other is the impact of migrations on the local training system.

Table 1: Forms of Circulation of Competencies and Structural Changes within Three Swiss RPSs

RPS and period	Type of migrant	Circulation and anchoring of competencies		Structural change
		Type of mobility	**Type of anchoring**	
Watchmaking 1950–1970	Immigrants without qualifications	Alternating, then permanent migration	From the lowest positions; no competence required at the entrance; learning on the job	Drop in average qualifications. Structures became more rigid; lack of incentives for training
Watchmaking 1980–1990	Specialists in design/marketing	Migratory circulation	Integration and diffusion of new competencies	Reorganisation of the RPS around these new competencies. Repositioning of products with higher added value
Watchmaking 1990–2000	Transnationals, managers hired by foreign large companies	Migratory circulation; steps in careers oriented towards headquarters located in more central regions	From the top, No diffusion of competencies towards the rest of the RPS	Integration within international companies; loss of higher tertiary functions in favour to central regions
	Immigrants looking for watchmaking competencies	Circular, then permanent migration	Entrance via the lowest positions in the local labour market, then assimilation via training in an institution	Reproduction of local competencies thanks to local training system
Micro-technology 1990–2000	Specialists with technological competencies not available in Switzerland	Migratory circulation that may become permanent	Allocation or contextualisation	Maintaining local competitiveness thanks to the rapid combination of diversified competencies. The local research system allows new combinations
	Immigrants without qualifications, unskilled wives of migrants	Permanent migration and regrouping of families	Allocation	Lower costs within unskilled assembling operations
Communication 1999–2000	Specialists, creative experts	Migratory circulation	Acquisition and contextualisation Major, rapid diffusions	Continuous movement of the RPS around these new competencies. Repositioning of services within high value added sector

*Source***:** Authors' elaboration.

3.1. Effects of migrations on RPS structures

Current economic evolution consists of establishing a new international division of labour. The opening of national economies is bringing with it an increase in the international division of labour and a recentring of the production from each country towards a limited number of traded goods and services. For countries with high incomes, this recentring is taking place more often via innovation than via cost competitiveness. When we place this economic change in parallel with migratory flows, we are tempted to establish a succession. In fact, during the 1960s, the call for foreign labour was aimed at expanding the industrial sectors within a context of shortage of labour, technological stability and mass production. The characteristics of the immigrant labour force that interested receiving countries at the time were availability and the capacity to carry out predetermined tasks. In such a system, immigrant labour was not a driving force behind economic evolution, but simply constituted the extra fuel necessary to make the machine run faster. However, and with time, this system became dependent on the extra fuel, and the fact of deferring investments led to structures becoming more rigid (Stalder et al. 1994).

Today, competencies have become a much more central issue. As innovation becomes more crucial, access to a very broad and diversified international labour market appears as an important trump card. The "quality" of the individuals is becoming decisive, as is the capacity of companies to capture, mobilise and orient these competencies. In such a context, the circulation of competencies via migration plays a much more central role than it did in the past. Switzerland by no means possesses all the competencies necessary for adapting its activities or for the advent of new sectors. A country that offers comparatively high wages offers not only the possibility of finding the competencies its firms are looking for, but also incites them to imagine what they could produce thanks to those capabilities that they can mobilise. It opens up new development avenues.

This study has led to a better understanding of the role of migration in three sectors representative of the current changes in activity. In watchmaking, a traditional sector but one with a high innovative capacity, based to a large extent on micro-mechanical know-how, immigrants bring with them new, strategic competencies in the areas of design or marketing. These are competencies that were crucial to the evolution of the sector during the years 1985–95. As the sector identified the opportunity to develop in that direction, immigrants, especially from France and Italy, were attracted to it, thus making it possible to articulate these competencies – new for the region at that time – with the traditional local know-how (Crevoisier 1993*a*). In the area of manufacturing, on the other hand, immigrants still occupy unskilled positions. Often, moreover, they complete additional training in Switzerland and hold positions similar to those occupied by locals. In micro-technology, an area that is evolving rapidly and where training and research is carried out in several countries, the circulation of competencies plays a much more central role. The capacity to acquire specialised labour with capacities complementary to those found in Switzerland is a driving competitive force within

the sector. Finally, in design, publicity and communication, the circulation and integration of competencies is often the key to accessing markets, which are becoming more and more international.

While traditional immigration during the years 1950–70, which inspired the theory of production structures becoming more rigid, was based on the substitution capacity between new investments (source of uncertainty) and foreign labour (less costly and more flexible), a contrary situation exists today. The emphasis is now on complementary aspects between existing and developing activities and the necessary competencies to make production structures evolve. Immigration at the end of the 1990s became more a factor for the evolution and modernisation of productive structures, thanks to innovation. However, we must avoid a simplistic dichotomy here. The immigration of workers with few or no skills continues today, and services numerous sectors of the economy (hotels, restaurants, health sector, etc.). Generally speaking, however, the current role of immigration in economic activities is today much more of a driving force than in the past, and thus clearly goes beyond the traditional patterns.

3.2. Effects of migrations on local training systems

Work on the national or regional innovation systems highlights the complementary aspects between economic activities and training and research systems. Nevertheless, these approaches mainly consider functional correspondences between training and research activities and firms. The issue of the labour market and labour mobility is generally not addressed. How does the circulation of competencies revolve around these questions? It seems clear that it is not possible, today, to train individuals in all the competencies needed by a competitive RPS. In fact, the area of training implies high fixed costs. Moreover, certain competencies may be essential for an RPS, without the number of employees being high. Even within the framework of a national economy, it is difficult to meet every need. In Switzerland, therefore, linguistic divisions within the country constitute a serious obstacle to sufficient specialisation of training sources at national level. The French-speaking area of Switzerland, where our study was carried out, has a population of only 1.2 million! Calling upon specialists trained abroad thus appears to be essential.

To what extent does a trade-off exist between setting up a regional or national source of training and attracting foreign specialists? In fact, companies are to an increasing extent seeking rare competencies that they can mobilise rapidly. They regularly exert pressure to obtain the necessary work permits. What should be the attitude of the state? Should it allow immigration or finance new types of training for nationals? Different elements must be taken into account: the types of competency required, the durability of the demand, the capacity of the companies to pay salaries for qualified nationals, etc. Moreover, there is an emerging need for increasingly specialised higher education, which in turn requires more and more

specialised curricula at both national and international levels. The circulation of students should also be taken into consideration.

This phenomenon of attracting qualified migrants is reinforced in Switzerland by the high general level of salaries, which makes it possible to bring in almost anyone. In less wealthy regions, we can see the opposite phenomenon developing: here, it is only possible to set up sources of training for specialists, as it is impossible to attract them from elsewhere … and those who are trained in this way are then tempted to emigrate towards countries where they receive better remuneration for their competencies!

4. Conclusion

Today, the change in the nature of borders and the falling costs for transporting goods, capital and personnel have considerably affected the changes within the RPS. In a context "... marked by the intensification of exchanges in general and of spatial mobility, groups of professional immigrants appear as a privileged group within current, new social and spatial dynamics" (Marotel 1993: 2). But how can we define the impact of these migrations on spatial economic dynamics?

The neoclassical approach to regional growth is based on the attractiveness of the wages of the region. Migrations correct imbalances in the labour market. This means seeing the issue from the viewpoint of individuals, independently of their environment, who are consequently able to choose the region where they wish to settle of their own accord. Basically, however, this approach can be equated to thinking that economic agents have their "heads in the clouds". From those "clouds" they observe various regions, each possessing a certain number of factors that distinguish them from the others in the eyes of these agents. This is the constitution of a "market" where the regions to choose between are on display and where moreover the choices can be regularly reviewed. The interest of such an approach is one of micro-economics: admittedly, it attracts our attention to the decision-making process regarding possible alternative choices about the localisation. Its main limitation, however, is that it implies considering attractiveness as a short-term aspect based mainly on individual decisions and not as a historical and spatial construct.

For this reason, in order to enrich migration studies, it is necessary to move beyond the paradigm of *attractiveness and mobility* of individuals to that of *anchoring and circulation of (more collective) competencies*, the latter being broader that the former. The RPSs are the result of the interaction of individuals, companies and the areas in which they are located, over time. The question is no longer "what region offers the best factors for localisation?" but "how are these RPSs constituted and how do they evolve?" The RPSs have a history and are characterised by relations that have been built up or broken down over time (Crevoisier et al. 1996). The individuals and the companies within an RPS are engaged in the production of the resources and needs of the local society. Thus, *understanding migrations also*

implies revealing the needs generated by the dynamics of the RPS, and the possibilities that can be opened up by the mobilisation and anchoring of competencies generated elsewhere.

Such a perspective makes it possible to formulate new research questions. First, is there now a relation between the dynamics of the RPS and the circulation of competencies via migration? This paper offers various elements that indicate that this is indeed the case. Flynn's study (1993) also follows this approach, and shows how interregional migrations allowed the region of Lowell (United States) to move from a traditional industrial structure towards the development of new activities. In fact, the technical change was possible thanks to the immigration of various categories of workers (highly qualified or unskilled) that were progressively grafted on to the labour force already in place. Restructuring this region (changing technologies, new products, creation of new companies, etc.) was therefore possible thanks to highlighting and making use of competencies from elsewhere.

This leads to the second question that can be raised: do the dynamics of an RPS create a call, a demand for competencies generated elsewhere, or is it the possibility of attracting competencies that incites local companies to change? This second question is essential in order to understand the impact of measures such as the free circulation of persons within the framework of the European Union: does this liberalisation facilitate changes within an RPS, or is it the driving force behind them?

Note

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The Limits and Possibilities of Ethnic Entrepreneurship: The Case of ICT Firms in Sweden*

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This study explores the limits and possibilities of ethnic entrepreneurship by looking at ethnic entrepreneurs in the Swedish ICT sector. The focus is on why and how people with immigrant backgrounds enter the high-technology workforce. I discuss how ethnicity, discrimination or "outsider" status shape business development and whether ethnicity influences the hiring of co-workers. "Ethnic resources" sometimes provide transnational corporate links among co-ethnics, but "class resources" are often decoupled from systems to extend ethnic employment. Ethnic and class resources, together with outsider status, can promote entrepreneurial options. Yet not all firms value ethnic resources as opposed to class resources when recruiting employees. Consequently, it is often difficult to find ethnic entrepreneurship generating many qualified jobs for workers of immigrant background.

This study explores the limits and possibilities of ethnic entrepreneurship as a means of promoting social inclusion among workers of immigrant background. I explore cases of ethnic entrepreneurs working in the Swedish information and communications technology (ICT) sector, investigating three principal questions. First, why and how do those with immigrant backgrounds enter the high-technology workforce? Second, what is the importance of their ethnicity, discrimination or "outsider" status in establishing such businesses? Third, to what extent does ethnicity become a reason for hiring co-workers? This study finds that "ethnic resources" sometimes provide a means for creating transnational links among co-ethnics, but that "class resources" tied to university study, work experience and social capital accumulation are often decoupled from systems to extend ethnic employment. One conclusion is that factors such as immigrants' outsider status and managerial assessments of the relative worth of ethnic groups' social and human capital, as opposed to "ethnic resources", place limits on the ability of ethnic entrepreneurship to employ many immigrants in qualified jobs within the Swedish ICT sector.

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While many have studied ethnic entrepreneurs in relatively unqualified jobs or less advanced sectors, there are fewer studies of ethnic entrepreneurs in high-technology sectors (particularly in Europe). If ethnic entrepreneurship has been criticized for reproducing a new low-wage service class, then it is useful to explore the barriers towards linking ethnic entrepreneurship to quality jobs. Entrepreneurship among qualified immigrant entrepreneurs appears to generate relatively few qualified immigrant jobs, however.

1. Entrepreneurial Job Quality

Critics of ethnic entrepreneurship in Sweden, such as the policy analyst Hedi Bel Habib, see it as potentially producing a class of individuals "who in fact earn much less" than immigrants holding regular jobs (Bel Habib 2001, cited in Slavnic 2004: 6). A longitudinal register covering all individuals older than 16 living in Sweden found that Swedish immigrant entrepreneurs "have substantially lower incomes than employed immigrants and only marginally higher levels of disposable incomes compared to the unemployed when other background variables are held constant" (Hjerm 2004: 739).

Therefore the quality of work, rather than just employment, is a key question for evaluating ethnic entrepreneurship. The discourse surrounding social inclusion, however, often sidesteps the larger question of equality (Levitas 1998). Some Swedish policy-makers have ignored the possibility of high-technology ethnic entrepreneurs. They tend to define ethnic entrepreneurship as employment in less-qualified or service-sector jobs, with the business press providing a more nuanced view (cf. Skarin 2002). Many focus on entrepreneurship as an employment generator rather than as a means for promoting equality: "On the macro level, entrepreneurship amongst immigrants has been seen to contribute to decreasing levels of unemployment as well as creating and sustaining economic growth" (Hjerm 2004: 741). Economic equality, however, depends on broadening the number of ethnic workers in *qualified jobs*. A survey of 173 Kista Science City ICT companies in 2003 (46 per cent response rate) found only 8.3 per cent of employees had ethnic backgrounds. Most ethnic employees (71.6 per cent) worked at companies that were neither start-ups nor spin-offs (Feldman 2006).

2. Ethnic Entrepreneurship in Qualified Jobs: Turning Outsiders into Insiders

2.1. Overview

Ethnic innovative entrepreneurs have immigrant backgrounds, using their technical knowledge when establishing businesses. As outsiders, such potential entrepreneurs may be alienated from key resources necessary for qualified jobs. They can use "ethnic resources" tied to their immigrant background but also require "class resources" based on university study and contact networks (cf. Light

and Gold 2000). Consequently, outsiders will somehow have to gain resources in the form of power (political capital), knowledge (human capital) and contacts (social capital) available to insiders. Political capital corresponds to the decision-making power that comes from "being your own boss" via entrepreneurship. Human capital corresponds to technical and entrepreneurial skills. Social capital corresponds to the contacts useful for accessing customers, knowledge and work experience. Entrepreneurial possibilities and access to such capital can be promoted by "bridging" systems, ethnic resources, and other means available to growing firms, especially through access to financial capital.

2.2. Political capital, outsider status and entrepreneurship incentives

The outsider status of qualified immigrant entrepreneurs is "overdetermined". It is shaped by the exclusion that innovators *and* immigrants can face from ethnic majority managers' power. There are two reasons why such potential entrepreneurs often need the political capital or decision-making power that comes from owning one's own firm. The first corresponds to the potential tensions between innovators and the financial managerial powers above them. By becoming entrepreneurs, engineers gain managerial power to support innovations or business ideas neglected by their employers (Feldman 1999). The second reason is that discrimination, ethnic difference or outsider status create barriers to acceptance and advancement, if not employment (Lindbeck and Snower 2001). To the extent that discrimination exists and is accompanied by a restricted labour market, what happens to more qualified persons with immigrant backgrounds? In Sweden, as many self-employed immigrants have higher education and "have jobs that are below what would be expected given their level of education and competence … the cultural or the traditional parameters lose much of their significance for an explanation of self-employment among immigrants" (Kamali 2003: 231).

A study of immigrant self-employment in the United States found that "although foreign-earned human capital is usually not highly valued in the host labor market, immigrants successfully use this human capital to achieve business ownership" (Sanders and Nee 1996: 231). Self-employment provides a means of "valorising" (or realizing the full value of) educational credentials received abroad. Outsider status can trigger ethnic entrepreneurship because of discrimination or the ways in which immigrants are received by established groups who are "insiders". Insiders often gain economic advantages in the labour market when outsiders are excluded, translating into social exclusion (Lindbeck and Snower 2001). Nevertheless, "people who are socially 'marginal' – either because they are still young, or because they are social outsiders – may prove more creative, because they do not fully subscribe to the dominant value system" (Hall 1998: 17).

2.3. Human capital, social capital, education and work experience

The human capital of immigrants provides a potential base for qualified ethnic entrepreneurship in Sweden. A study of immigrant entrepreneurs in 2000 found that almost 31 per cent had more than three years of university or college study. The share having any kind of higher education was 46 per cent for immigrants and 42 per cent for non-immigrants. These results are "opposite to the common understanding that immigrants, starting their own business, would be less educated than Swedes" (Brundin et al. 2001). Nevertheless, these capacities are not sufficient for certain forms of entrepreneurship or employment.

Insiders have important assets in the form of knowledge and contacts necessary for immigrant outsiders' professional and entrepreneurial development. While many Swedish immigrants may be "highly qualified" (some having more university training than Swedes) the level of formal qualifications of both immigrants and non-immigrants may be less important than the *quality* of human capital or knowledge and contacts acquired when it comes to establishing a high-technology business. Especially in high-technology firms, the required quality has several aspects.

First, it is often based on work experience rather than formal learning. Labour markets are changing such that future chief executives "need to take charge of their own career development because companies are less likely to groom entry-level professionals for lifetime careers". Management experts argue that companies increasingly expect new hires to know more about business (White 2005: A9). A study of immigrants arriving in Sweden during the late 1980s that explored their conditions in 1995 found that differences in education influenced the probability of being employed less than did work experience in Sweden (Rooth 2000).

Second, the required human capital is often based on long service in applied activities at a firm (or series of firms). One study of US high-technology start-ups showed that the founding technology was linked more to "development in contrast with research work". Advanced education around Master's level was important for technological development, as was "long employment at a 'source' organization" (Roberts 1991: 283). Another study shows "the stock of information and knowledge that underlies profit opportunity by a nascent entrepreneur is not the result of deliberate search efforts." Rather, "this informational substructure" evolves "unintentionally during paid work histories" (Vaessen 2003). Engineers and innovators learn not only by doing but also by making use of the resources of established firms to gain exposure to potential applications, technologies, and observing functionality in experiments paid for by the employer. There is a mutually dependent relationship between learning and access to resources (Feldman 1999).

Third, the knowledge acquired is often heterogeneous and diverse. One part of this principle is that engineers often move from being "specialists" to "generalists" as they advance through a firm (Lazonick 1991). Diverse sets of knowledge are

required for entrepreneurs because of the nature of entrepreneurial human capital. Employers engage in various roles corresponding to diverse functions such as purchasing from suppliers, arranging for financial capital, and fostering technological development (Marshall 1961: 297).

Finally, such diverse sets of knowledge can often only be acquired in large firms. While there may be innovative advantages and disadvantages to small and large firms alike, often knowledge developed in expanding small firms was acquired in a larger firm. The wide array of knowledge bases within a large firm creates advantages for later firm formation (Eliasson 1996: 125). Universities can provide such knowledge, however, when they provide a connection to development work (Feldman and Klofsten 2000).

Immigrants are often alienated from certain kinds or quantities of social capital (or contacts), a key resource for business development. This affects the extent to which immigrant outsiders become insiders or successful entrepreneurs: "the personal network of the owner-manager is the most important resource upon which he or she can draw in the early days of the firm's development" (Ostgaard and Birley 1994: 281). A study of technology-based new firms concluded that "by fostering social capital within the firm and in external relationships, significant benefits can be achieved for the firm's knowledge base and international growth" (Yli-Renko et al. 2002: 279). The extent to which a person has an outsider status may reduce possibilities for entrepreneurship. One view is that within Sweden "many immigrant entrepreneurs have business backgrounds, are ambitious, and want to develop as well as educate themselves. They have broad social networks with their compatriots, but not as broad as the business networks that native-born Swedes have" (Najib 1999: 79; cited in Slavnic 2004: 4). An analysis of 2,600 foreign-born small-business owners found that the contact base of certain groups, such as those from the Middle East, was less centred on Swedes than co-ethnics (Nutek 2005). In less-qualified jobs, European immigrants' social capital and networks have proved useful (Kloosterman et al. 1998).

2.4. Bridging systems

The acquisition of human and social capital tied to work experience at qualified jobs depends on various "bridging systems". Integration requires that excluded groups understand and incorporate elements of dominant groups' culture (Godfrey 2003), find bridges into mainstream work that bypass the "risks" or prejudices of potential employers, and receive support from champions (Feldman 1999) or contacts who provide access to knowledge and other resources. Culture bridges are key because: "the acquisitions of individual job skills, i.e. skills which have an existence independent of the context in which they are displayed, is dependent upon the success of [a] socialization process … in which the individual accommodates himself to the work group and learns to conform to its norms and mores" (Piore 1973: 253–54). Swedish immigrants' qualifications have been undervalued in professional occupations such as engineering, in part because

accepting such credentials is viewed as risky (Aerts et al. 2003). Perceived risks can be reduced by building bridges between outsiders and incumbent managers through networks. These can link recruited workers to workplaces through personal contacts or "referrals", usually those already working at a firm (Waldinger 1998). The problem of risks (or prejudice that assesses risks such as "foreign credentials") can be sidestepped within firms' having a business philosophy favouring diversity (cf. Zachary 2003).

Universities act as bridges into firms through their reputation and by providing short-term internships that involve a less-risky way to assess and employ people. The university's role in facilitating contacts, employment and residency permission may be more important than its role as a skill provider. In the United States, many engineering jobs do not require a Ph.D. Rather, the university becomes more important for social capital and gaining insider status. Foreign students use study as a stepping-stone to an employment permit: "it puts them in physical proximity to employers, they make industrial contacts through their professors, etc." (Matloff 2000: 71).

3. Methodology

This study is based on three detailed cases of ICT firms in Stockholm, with a supplementary analysis of two additional ICT companies in Sweden. Each of the five companies selected was headed by an immigrant entrepreneur. Two of these firms were based in Kista Science City, a subregion of Stockholm including a science park and ICT University linked to the Royal Institute of Technology and Stockholm University. All interviews were conducted in 2005. Entrepreneur names are pseudonyms. Like most case studies, the focus is on "how" and "why" questions.

4. Case I: Fazel's Small-Scale Enterprise

4.1. Background and company description

Fazel is the head of a consulting and software design firm located in the Kista Science City region. He was born in Iran in 1955 and emigrated to Sweden in 1979. He has lived with a Finnish woman since the early 1980s. His five-year-old firm represents the continuation of another firm. Fazel's only co-worker is a "native Swede". His firm has remained small because of financing problems and his inability to gain early-stage resources via advanced standing in a university or large firm.

4.2. Outsider status and entrepreneurship incentives

Fazel has not been able to overcome the constraints of his immigrant, outsider status. Rather, he has negotiated this by becoming an entrepreneur. Fazel explained problems in negotiating Swedish culture as follows:

> I have never felt discriminated against during these years I have been in Sweden. But I think it has been difficult to be in communication with [Swedes] … to have a contact with them … You can talk with them, but it's not enough. It is very important that you have the feeling that they will listen to you and you can have contact with them. This was very difficult.

These cultural differences mean that it could take him perhaps twice as long as a native to learn about or establish a connection with an "ethnic" Swede. Among the barriers is the way he uses the Swedish language and his expressing certainty about his ability to do a job. He feels proficient in Swedish, but explains that some customers prefer him to say "I think I can do a job" rather than simply saying "I can do a job".

In job interviews, for example at Nokia, Fazel has not felt that potential employers regarded what he said as important or interesting. When selling a product, however, Fazel can establish a connection and has credibility. It is easier to establish an income-generating relationship with Swedes as an entrepreneur than as an employee. He can demonstrate his ability through specific projects. Nevertheless, he thinks that it would be easier if he were Swedish. As an entrepreneur, he gains what amounts to "project employment", where his customer/employers can take reduced risks in "hiring him" for a job. Moreover, by working as an outsider and entrepreneur, he does not have to worry as much about establishing a connection to the way in which Swedish "ethnic culture" is represented and circulated within the firm. In such cases, the product is delivered, money is taken and he is "finished with them". The amount of interaction and the need to adjust or establish a connection with Swedish "ethnic culture" is reduced.

4.3. Sources of social and human capital

Fazel was not able to establish a foothold in the university or corporate worlds tied directly to the ICT sector when establishing a number of firms. On the university front, he faced a series of problems. He entered Sweden as a guest student. From 1979 to 1986, he took courses at Stockholm University and Uppsala University. He studied Swedish during his first year at Stockholm University. He then began studying economics at Uppsala University, but could only do so for one term. He had come from the Islamic Republic of Iran shortly after the revolution. Like many other Iranians who came to Sweden, he had friends who were in prison or had been murdered, making it difficult for him to concentrate on his studies or do much work during his first few years in the country. He eventually studied national economy but later had to find work. He lacked appropriate student financing and without either employment or studies he would have been forced to leave Sweden. Initially, he did not have permission to stay in Sweden based on being a political

refugee and was required to show financial support for his studies based on monies received from Iran. He could not obtain such funds and ended up having to work. In sum, Fazel's studies were disrupted by the trauma of the Iranian revolutionary aftermath and his need to work. These factors precluded graduate study and the accumulation of advanced technical knowledge and contacts there.

Fazel became an ICT entrepreneur to valorise his professional status. He was not successful in finding work relevant to his economics training after sending out several job applications (with 10 per cent replies to his letters but no resulting job). He decided to work in the emerging computer industry, which then created growth opportunities and required less formal qualifications. Fazel sold computers, wrote programs, trained personnel, and worked as a computer consultant. He was never employed at a large established ICT firm where he could gain access to specialized technical or managerial skills.

4.4. Bridging systems

A customer helped Fazel to establish his first firm. In 1986, a Swedish manager at a computer delivery firm asked Fazel if he had the finance he needed to establish one of his business projects for computer training. Fazel explained that he did not, because he could not secure a bank loan. He also lacked computers for demonstration models. The manager loaned Fazel 30,000 crowns without any security and gave him two computers. Fazel stayed in contact with this man over a six-month period, during which he demonstrated his capacity for hard work. After six months, Fazel was able to repay the loan and the use of the computers. Fazel used his own business to sell the manager's computers, thereby promoting the products of his "champion". The Swedish importer essentially used Fazel's storefront as a distribution channel. Fazel's firm was part of a vertical distribution system tied to the company headed by his Swedish "champion" in the delivery firm, but Fazel did not actually work for this firm.

4.5. Ethnic resources

Potentially, Fazel's use of ethnic resources could be a key to growth. He has developed websites for customers and internally as part of his firm's development initiatives. One major project is the establishment of a website for buying and selling products for the international Iranian market (including the Iranian diaspora). In April 2005, he had worked for two years developing this project. The long development time reflects the fact of the firm having only two full-time employees. This small size in turn is based on a lack of capital. The Iranian market includes over 68 million people living in Iran, plus several million with Iranian backgrounds living in Europe and the United States. About one in four Iranians with college education work outside Iran. Iran's telephone and broadband systems are not well developed, making it easier to develop internet websites in Sweden.

Fazel was unable to find many co-ethnics or ethnic co-workers who could provide him with a bridge into the kinds of research and development knowledge that facilitated a large-scale breakthrough. At one point, however, he joined forces with another immigrant because as outsiders they both needed cooperation with someone else to organize work. He set up a firm together with a Pakistani immigrant who was the instructor of a computer course he attended. After two years, their partnership ended when the instructor continued his work in a training company. A friend introduced him to his current co-worker and partner. This "native Swede" was valued and hired based on his specific technical knowledge and personal chemistry.

One intervening variable that may influence ethnic resources in recruitment is growth potential based on the ability to attract external financing. Fazel's ventures with both Iranian firms and the Iranian market have been constrained by a capital shortage. He estimates that if his company secured more financing, then perhaps 50–70 per cent of new employees would be Iranian.

5. Case II: Ozhan's Software Start-up

5.1. Background and company description

Ozhan and his parents were born in Iran. He runs a software start-up enterprise based in Kista Science City. Born in 1963, Ozhan moved to Sweden to study in 1987. Like Fazel, he emigrated to Sweden at the age of 24. Ozhan was less affected by the worst traumas associated with post-revolutionary Iran, however. One reason was that he was not connected to the circle of people politically involved in opposing the religious right who came to dominate Iran. Ozhan was less a political refugee than Fazel. Also, unlike Fazel, Ozhan's firm has been successful in getting European Commission and Swedish Government financing. The company is built upon an extension of the "smart card" business into the market for "machine readable travel documents". It has a core group of about six partners and one of these, like Ozhan, has an Iranian background.

5.2. Outsider status and entrepreneurship incentives

Ozhan believes that he was a victim of discrimination while working at a large ICT firm in Stockholm. The managers there initially doubted that he could cope with one of the assignments, thinking it was too difficult for him. He was able to do the job, however, in a much shorter time than his managers thought possible. He did not find this large ICT company very supportive of his ideas.

Ozhan describes his outsider status vis-à-vis the ICT firm in three ways. First, despite quickly solving a key technical challenge when working there, he was unable to gain the confidence of a key supervisor. Second, more importantly, one of his key supervisors told the dozen or so potential employers where he later

applied for work that they should not hire him. Third, this same manager told Ozhan that "we can't have more like you working here". As Ozhan was a high performer, he and others took this to mean that the manager did not want "more immigrants" working there.

5.3. Sources of social and human capital

Ozhan first worked in the interior decorating business in Iran and later took over his father's radiator firm when he died. There he gained valuable experience as an entrepreneur. In Sweden, he began to study Swedish in a government-run programme, and later decided to study engineering. He went to the prestigious Chalmers Institute of Technology in Gothenburg, receiving an M.Sc. Through an internship, he contacted Ericsson in 1996–97. After Ericsson, he worked in the Netherlands as a consultant and software assembler for a large firm. Later he was project manager and developer for Saab in the UK, Germany and Switzerland. His last job before founding his own company was for the "parent company" (which had 400 employees). At the end of 2002, the company he founded had its shares publicly traded.

While his Iranian-based skills were useful, far more important was his work experience with large Swedish firms. In particular, the "parent company" helped to expose Ozhan to very specialized bodies of knowledge that would be useful in the later development of his own firm. His business idea developed in this "parent company", yet the parent did not want to focus on the sector of the business that Ozhan had prioritised. He saw future directions for the market that others either did not see or did not wish to emphasise because they were not considered part of their core business area. Ozhan worked on this idea in his spare time before establishing his own business. Other sources of critical development knowledge included university studies and learning through each new business where he worked. The diversity of markets and sizes of these companies taught him about the advantages and disadvantages of various business models. Knowledge acquisition was also built on expert employees and consultants, as well as partner organizations, having knowledge of their respective country's visa and passport requirements.

5.4. Bridging systems

Ozhan was aided by various forms of "bridging" systems such as the internship that helped him to enter Ericsson. He argues that his path to integration has been helped by being very conscious of Swedish cultural codes and by gaining proficiency over time in the Swedish language. In both, he was aided by his Swedish-born wife. In addition, once his business ideas gained credibility, Ozhan gained legitimacy as an entrepreneur. His credibility was extended with each new successful competition for support from external financiers. In some cases, his "native" Swedish partners (particularly one senior colleague now working for him) helped to smooth the way in various meetings. In addition, Swedish colleagues have helped him with nuances of the Swedish language that might be useful in the

business. His understanding of Swedish culture also aided Ozhan in his university studies, where he worked with both Swedish and foreign students. This pattern was unusual as foreign students worked mainly with each other.

5.5. Ethnic resources

The international nature of Ozhan's business and its focus on local knowledge of practices in specific countries means that diversity among employees has been useful. Even though few staff have ethnic backgrounds and foreign partners have been added, Ozhan and another Swedish-based employee have used their knowledge of Farsi to break into the Iranian market. This employee, a friend from Ozhan's youth, is the only other Swedish-based employee having an ethnic background. Ozhan has sought to hire employees with the best skills and contacts and these have tended to be "native Swedes". In the world of ICT start-ups, the emphasis is on a core of highly qualified engineers and marketers. The number of engineers with non-Swedish backgrounds is relatively limited and that of marketers may be even more limited.

6. Case III: Ahmed's Computer-Consulting Firm

6.1. Background and company description

Ahmed was born in Bangladesh in 1949 and emigrated to Sweden in 1976. He was a graduate in mechanical engineering from one of the best universities in Dhaka (Bangladesh) and was an engineer before emigrating. His wife was born in Sweden. Ahmed heads a consultancy company, established in 1987, that helps other companies to recognize the benefits of IT for their business. The company primarily sells services, not hardware. Some software is sold off the shelf, but all companies have customized applications. The company helps its customers to build such software. In 2005, it employed about fifty staff, making it the most successful, as well as the oldest, case profiled here. Ahmed's service-focused consultancy business sidestepped the need to gain external financing, i.e. unlike product-oriented firms it did not require much start-up capital.

6.2. Outsider status and entrepreneurship incentives

The "general perception" among his fellow foreign students when Ahmed was at Sweden's Royal Institute of Technology (Kungliga Tekniska Högskolan – KTH, Stockholm) was that even if he obtained a Master's degree, he would end up working in the subway system (an employer of many immigrants). Ahmed ignored such warnings because his approach was very pragmatic: "my first goal was to get the degree, the next goal was to get a job". Ahmed advanced into a relatively senior position at his first Swedish employer, Sandvik, by changing jobs and getting special assignments from superiors. This large firm created opportunities through such a diversity of projects and managers. Yet, Ahmed still faced a "glass ceiling"

(promotion barriers tied to ethnicity). A colleague told him that he would "never be president of a large company in Sweden". Ahmed recognized that discrimination prevented him from becoming the head of a large, conservative industrial Swedish firm. His ambition led him to think in terms beyond his present occupational standing, i.e. he felt that he would not "spend his whole life" with that company and would do something else. When he was trying for one senior job, a superior told him it could take ten to fifteen years to be promoted. Ahmed concluded that he "could not be the top guy" at a company employing 20,000 staff. After all, he had been told it would take him a decade to move up within the firm. Senior management had tipped their hand, letting it be known that he was being held back. Alternatively, it could be said that Ahmed's ambitions were greater than the company could fulfil. Another senior manager viewed him as a technician and did not believe that with his immigrant background he could be a "leader". Even though top managers were friendly, they did not conceive of him as being one of them in future.

Ahmed does not feel alienated from Sweden, however: "I never think about … that I'm an immigrant … It was not in my mind that I was an immigrant in my business life." When he worked for various firms at Sweden, he did not focus on being a foreigner or any discrimination he faced. Today, it is "much easier to communicate with a Swede than a Bengali person", although there are still things that he does not understand in Sweden.

6.3. Sources of social and human capital

After graduation in Bangladesh, Ahmed worked at an oil refinery. He received training in Yugoslavia, living there for a year and working for two companies. He then began to think about studying for a doctorate in an English-speaking country. He met some students, however, who said that Sweden was "a paradise". His good grades in Bangladesh and ability to market himself helped him to get a place at the Stockholm-based KTH, where he received an M.Sc. While his present company's business activities more closely corresponds to Ahmed's prior work experience than his university studies, one area where his education was essential was in helping him to become a manager. This role was new to him and his university studies prepared him to do basic research to learn new things. In addition, his industrial engineering training involved economic and management studies.

By working at a series of companies, Ahmed was able to gain the necessary experiences and skills to establish his own company. Through learning by doing, he gained knowledge. At Sandvik, Ahmed's job involved work with technical consultants concerned with the production process. While he never dealt with external customers, he gained skills in networking by marketing his skills to managers and departments *within the firm*. Ahmed started his job in the industrial engineering department when the boss there was on leave, leading to questions about who he would report to and what he would do. Then, Ahmed was told to introduce himself to various managers throughout the department.

As an industrial engineer, Ahmed put himself in the position of being of service to other managers in the firm, for example by marketing himself. After meeting several managers who thought nothing new had to be done, Ahmed found one who was interested in assessing whether a production process was actually profitable. Ahmed asked him when he wanted the work completed and after a long pause was greeted with the answer, "no production engineer has ever asked me this question before". Ahmed worked his way up the firm in this way, doing valuable work for important staff members and establishing a good reputation through various projects. He also gained consultant skills through this process.

At Datalogic, Ahmed met a number of valuable customers that he could make his own. Thus, work experience not only provided human capital in selling services and learning various technical skills, but also access to potential customers (economic capital). In summary, in some cases the links between the firms he worked for and the ICT sector were less important than the ability to gain contacts and generic business skills.

6.4. Bridging systems

At KTH, most foreign students did their Master's thesis work at the university. Instead, Ahmed picked a private company. This choice helped him to gain business contacts. He found an internship position at Sandvik. One lower-level manager did not believe that Ahmed could do the job by himself, but a more senior manager believed that he could handle the job. In fact it lasted only three months and was "not a big deal", yet it helped him to gain formal employment within the company. At Sandvik, Ahmed made inroads despite a recession because he developed a proposal for radically improving efficiency. At that time his "Swedish was awful" so he asked a manager's help in formulating a proposal in better language. The company became interested in him because, while his immediate superiors did not like his proposal, many other managers did.

Family connections provided Ahmed with an introduction to the benefits of the consultant occupational niche. One of his wife's sisters was married to a founder and head of a consultancy firm employing thirty to forty staff. Ahmed learned that the manager "had a nice life".

6.5. Ethnic resources

In the beginning, Ahmed's company was attractive to new employees because it had fewer rules. Part of the reason may have been that as an immigrant and novice, he was unfamiliar with all the bureaucratic procedures that usually dominate Swedish firms. Being an immigrant, he was relatively new to the Swedish business world. This novelty in turn created an incentive to come up with a bonus system to attract employees from more established firms. It was a business decision to use the bonus system but as a non-established entrepreneur he had to be more innovative.

Today, none of his employees has an immigrant background. After seven years, he hired one Bangladeshi who stayed for only six months. That was the only "co-ethnic" who ever worked for him. The only other non-European immigrant worker, eventually made redundant, was from Morocco. Some other immigrants have a European origin. At the outset, he only wanted consultants "who had long track records and some customers [who] knew them" and to whom they could sell something. Unfortunately, there were few women or immigrants who fit these criteria. He "could not risk anything" and just "wanted people who were the best". Each new employee had their own contact network. Thus, as many immigrants have fewer contacts or social capital in the Swedish ICT world, they were unlikely to be hired.

7. Supplementary Cases

Mahmoud is an ICT entrepreneur born in Iran in 1967, who came to Sweden aged 20. He works in a three-person company in Kista involved in business systems that support broadcasting. He argues that the lack of contacts makes it difficult for immigrants to find employment in large firms. Like Fazel, he says that "it is difficult to get into the Swedish community". Even many of the professors and students at KTH view him as a "foreigner" and so it is difficult to make contact with them to develop business ideas or innovations. He now works with Swedes with whom he has worked before. One partner, with a Hungarian background, provided help as a consultant with technical expertise. This individual, like Ozhan's Pakistani partner, may have had the "outsider's" incentive to work with him. Mahmoud highlights the limited value of ethnic resources in the domestic market, arguing: "You need contact with Swedes in Sweden, so just having a group of immigrants start up a firm is difficult, unless your customer is in Germany or the US." In addition to language links, this explains why ethnic entrepreneurs have turned to export markets.

Hashemi, who was born in Iran in 1966 and came to Sweden in 1985, heads a fifteen-person company in Linköping, associated with a variety of areas in software development, hardware sales and business services. Seven of his employees have immigrant backgrounds, from countries such as Bosnia, Serbia, Russia and Senegal. The company's business philosophy explains why the company is so ethnically diverse. It also benefits from having Swedish workers. Yet, Hashemi explains that "if I have an opening and persons with two different backgrounds apply, one Swedish and one ethnic … if both have the same capacities and the same studies, then we prefer to hire the person with the ethnic background". He believes that "they have something extra", providing an advantage. This includes the possibility of providing support in different languages within Sweden, as well as design advantages. For example, the company has successfully introduced stock inventory software, building on practices found in Iran. Hashemi argues that immigrants might do better in the labour market using their foreign background in marketing themselves, rather than by saying that they are as good "as a Swede".

8. Conclusions

8.1. Outsider status, social capital and human capital

Highly qualified entrepreneurship can help to create opportunities for top managers and company founders who as immigrants are outsiders. The three major cases discussed reveal entrepreneurs who at different points in their careers were outsiders. In Fazel's case, however, his early history of problems in maintaining a university foothold and the need to work to maintain his residency alienated him from the human and social capital available in educational and work spheres. In contrast, Ozhan and Ahmed were both able to gain valuable technical knowledge of a specialized nature and contacts in the university and corporate world. Ozhan and Ahmed also gained knowledge about business strategies from their various jobs. Ahmed's case especially highlights details about how such resources are accumulated. Ozhan was less affected than Fazel by the traumas caused by political repression in post-revolutionary Iran because of his social background and distance from active political opponents of the regime. In some ways, Ahmed and Hashemi's outsider status became an advantage in promoting alternative business models that helped their firms to grow. In our major cases, alienation from Swedish corporate culture (or discrimination) led immigrants to establish their own firm, but Ozhan and Ahmed were able to gain access to employment in established firms and therefore the diverse resources of large Swedish enterprises. In recruitment, many ethnic entrepreneurial managers believe that ethnic resources do not outweigh the need for specialized human capital and contacts, which they associate with "native Swedes". Some managers saw special advantages in hiring native Swedes, others in hiring immigrants. These choices are influenced by business philosophy, assessment of ethnic capabilities, and the legacy of prior exclusionary processes that reduced immigrants' capacities. When immigrants establish highly qualified companies, however, the advantages of ethnicity are usually less important than specialized, firm-specific, insider knowledge and contacts. Given its relatively advanced ICT sector and insider networks, work experience and training within Sweden was often far more important for establishing ICT businesses than that gained in home or third countries.

8.2. Bridging systems

For Ozhan and Ahmed, the university was a key bridge into the resources of large firms, with the internship a central structure allowing the leap from university to corporate worlds. Fazel was not in the university system long enough to gain full access to this bridge. Fazel has a Finnish partner, whereas Ozhan and Ahmed are married to Swedes. This gives the latter two certain advantages. Ozhan and Ahmed had more success in negotiating Swedish cultural codes than Fazel, while Ahmed's partner gave him access to a social network that exposed him to the benefits of consulting. Key champions supported both Fazel and Ahmed in their careers. In Fazel's case, the champion was a key customer, whereas Ahmed's supporters not

only included customers but also employers who allowed him access to large firms' learning space, technical knowledge and contacts.

8.3. Ethnic resources

All cases except Ahmed benefited from ethnic resources. Fazel and Ozhan, the entrepreneurs of Iranian background, have each sought to use the large-scale Iranian market as a key source of business growth. Yet the ability to exploit such ethnic resources or capital is itself contingent upon the ability to secure financial capital. Unlike Ozhan, Fazel has received no formal grants from lending agencies. Ahmed's consultancy-based projects were in essence self-financing (with advantages over Fazel in gaining customers based on work at other firms). In all three firms, the premium placed on specialized knowledge and contacts did not lead directly to employing co-ethnics except insofar as partnerships were forged with companies directly tied to the Iranian market (or individuals with Iranian language skills and understanding). Ahmed is highly tied to the Swedish market, with no business focus on "co-ethnics". In contrast, Hashemi's business philosophy favours hiring immigrants, as he believes ethnic resources are as critical as Swedish contacts. He does not attach special value to minutely specialized skills. Fazel's financing problems and outsider status prevent him from hiring more employees, many of whom would have immigrant backgrounds.

8.4. Other conclusions with policy relevance

Ozhan argues that, given their share of the population in Sweden, immigrant entrepreneurs are over-represented in low-skill businesses and under-represented in high-skill businesses. The range of experiences Ahmed gained in switching among different firms could not easily be replaced or duplicated by an incubator programme unless it built upon the "experience spaces" gained in various jobs and tasks. While some useful support programmes help ethnic immigrants with language, mentors and complementary skills (such as business-plan preparation), they do not provide access to the kind of specialized knowledge, networks and contacts usually required in highly qualified businesses such as ICT firms. ALMI, a government-financed development organization, has provided such contacts to ethnic entrepreneurs, including Ozhan. Yet a precondition seems to be his earlier ability to form bridges that many other immigrants could not. Managers' preference for specialized skills and social capital held by "native Swedes" when developing work teams often reproduces social exclusion in qualified ethnic entrepreneurship. As a result, incubator and mentor programmes must be complemented by more advanced professional networks. The government should subsidise sophisticated experience spaces and internships in cooperation with ethnic networks of university graduates, universities, businesses and trade unions. Otherwise, ethnic entrepreneurship even in qualified jobs will be of limited use in promoting social inclusion.

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OPEN FORUM

Cracks in the Wall of Multiculturalism? A Review of Attitudinal Studies in the Netherlands

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This article examines the seemingly widespread view that multiculturalism in the Netherlands is in jeopardy. Empirical studies are reviewed. Multiculturalism is supported more by Dutch immigrant groups than by Dutch mainstream society. Mainstreamers are neutral towards multiculturalism, strongly feeling the need for equal rights and opportunities for all ethnic groups but not willing to actively support multiculturalism in the Netherlands; moreover, they think that immigrants are insufficiently adapted to Dutch society. Whereas immigrants often favour cultural maintenance (notably separation) in the private sphere and adaptation (notably integration) in the public sphere, mainstreamers prefer assimilation by immigrants in both spheres. It is concluded that public attitudes towards multiculturalism have not undergone appreciable changes in the last five years and that the presumed deteriorated state of multiculturalism cannot be accounted for by the views of the public.

Multiculturalism is a dynamic and multifaceted concept. In the introductory article to a special issue of this journal, Rex and Singh (2003) argue that the concept of multiculturalism has covered various topics during the last sixty years, ranging from concerns about immigration in the 1950s and 1960s to the dangers of marginalised immigrant groups in the wake of terrorist attacks since 2001. Various (sub)disciplines such as sociology, culture theory, political philosophy and managerial perspectives have studied multiculturalism (Koenig 2003). Important topics of study have been corporate governance of multicultural societies, protection of civil rights in liberal societies, relationship between the public and private spheres, and delineation of management styles and principles that strike a balance between maintaining social cohesion and protecting individual freedom

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(e.g. Rex and Singh 2003; Tiryakian 2003). Much literature published in the last five years argues that multiculturalism is in an unhealthy state or even in crisis (e.g. Joppke and Morawska 2003). A combination of the permanent threat of terrorist attacks, the emphasis on the assimilation of immigrants and the failure to establish fully fledged multiculturalism policies are seen as indicators of serious problems.

Various definitions of attitudes towards multiculturalism can be envisaged. Jacobs (2004) emphasises the recognition of diversity and support for the protection of rights of all groups, while Siebers (2004) views it as "the multiplication of experienced difference" (p. 300). Tiryakian (2003) makes a distinction between "multicultural" as a demographic feature of modern societies and "multiculturalism" as an ideology (cf. Arends-Tóth and Van de Vijver 2003). This paper, focusing on ideology, defines multiculturalism as the acceptance of and support for the plural composition of a society; it refers to attitudes vis-à-vis the cultural diversity of the population (Berry and Kalin 1995, 2002).

Multiculturalism has become a sensitive topic in the Netherlands during the last few years. It is taken for granted that the "multicultural experiment" has largely failed and that Netherlands Government policies of the last three decades have been unable to achieve a state of integration and participation of all citizens (Penninx 2005). Jacobs (2004) voices an argument about multiculturalism that is popular nowadays: Multiculturalism policies are in a state of crisis in the Netherlands and support for multiculturalism has dwindled. Islam, particularly its fundamentalist aspects, is attributed a key role in this negative view on the state of the multicultural society in the Netherlands (Penninx 2005). This downturn is often associated with a series of major, negative events. The first was the attack on the Twin Towers of the World Trade Center in 2001, which due to its link with fundamentalist Islam became associated with problems of multicultural society in the Netherlands. The next events were the assassinations of the popular politician Pim Fortuyn in the run-up to parliamentary elections in 2002 and of the controversial director Theo van Gogh in 2004, who had made a short, critical film on the position of women in Islam. These events are viewed in the media as strongly impacting on the multicultural "climate" in the Netherlands. We concur that the public discourse has become more negative. However, the question remains whether the crisis in multiculturalism policies is matched by a reduction in support for these policies among the public. It is indeed demonstrated that our empirical studies do not at all support the seemingly received view that support for multiculturalism has strongly eroded in the Netherlands.

The paper has two aims. The first is to provide an overview of studies of multiculturalism in the Netherlands (mainly based on the work of our own research group). The second is to examine to what extent the presumed crisis in multiculturalism policies in the Netherlands is based on a lack of support among the public. The first section reviews models and studies on attitudes towards multiculturalism, and the second presents Dutch studies on the topic carried out by our own research group. Conclusions are drawn in the third section.

1. Attitudes towards Multiculturalism: Models and International Findings

Various Western governments, including that of the Netherlands, have embraced a policy of multiculturalism, usually as a response to the growing cultural diversity of the population. There are important commonalities among the multicultural policies that have been developed. Policies typically aim at (a) stimulating the participation of immigrants to mainstream society, (b) improving their social and economic position, (c) establishing equal rights, and (d) preventing and eliminating discrimination. The government now assumes a proactive role in this process. Policies aim on the one hand at restricting immigration and on the other hand at stimulating the integration of immigrants (e.g. by enforcing the acquisition of basic linguistic and cultural knowledge by immigrants).

Various taxonomies of multiculturalism policies have been proposed in the literature, usually defining anchor points along a dimension that ranges from total exclusion to total inclusion and accommodation of the specific needs of immigrant groups (Rex 1998; Tiryakian 2003). We discuss two examples. A currently popular taxonomy of multiculturalism policies has been developed by Bourhis et al. (1997; see also Barrette et al. 2004). Their Interactive Acculturation Model holds that there is a relationship between immigration and integration government policies and acculturation orientations of both the majority and immigrant communities. They define four state policies vis-à-vis immigration:

1. *Pluralist* (immigrants should adopt the public values of the host country, such as commitment to democratic ideals, but have guaranteed individual liberties in personal domains and receive state support for establishing activities aimed at maintaining the ethnic culture, e.g. Canada).

2. *Civic* (the same as pluralist, but without the financial support for cultural activities aimed at maintaining ethnic identity, e.g. the United Kingdom and the Netherlands in recent years).

3. *Assimilationist* (immigrants are expected to give up their own culture and adopt the culture of the dominant group, e.g. France).

4. *Ethnist* (there is an officially enshrined ideology as to who can and should be citizens of the state, based on ethnically or religiously exclusive terms, while other immigrant groups face more problems to obtain citizenship; examples are Aussiedler (ethnic Germans) in Germany and Jews in Israel). The four state policies are hierarchically ranked in their order of presentation here; there is an increase in pressure put on immigrants by the nation state to adopt the values of the main society and to leave less room for expressions of ethnic culture.

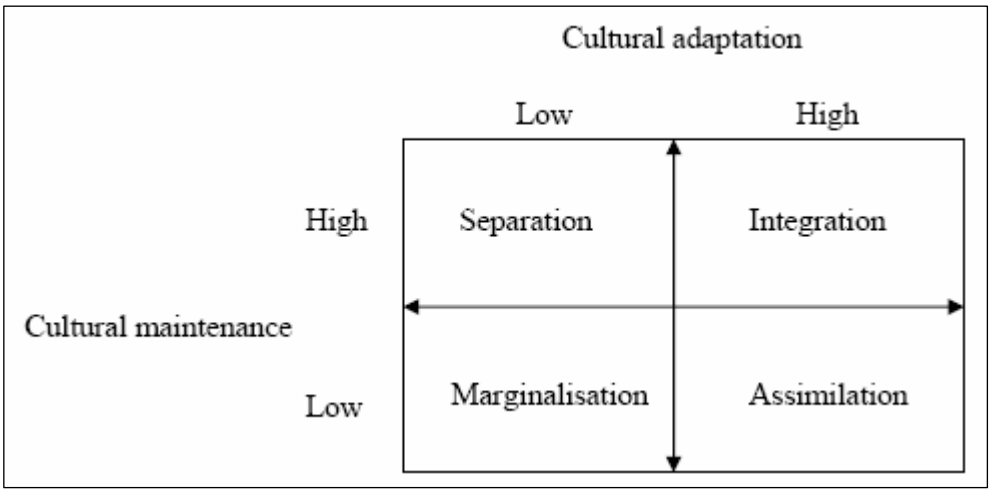
Until now, there have been very few studies in which all aspects of the Interactive Acculturation Model and their interaction have been addressed (e.g. Barrette et al. 2004). Studies on multiculturalism and acculturation preferences of immigrant and

majority groups have been carried out in a few countries (the next section describes some studies in the Netherlands in more detail). Studies in Germany (Zick et al. 2001), the United States (Citrin et al. 2001) and Australia (Ho 1990) show a neutral (indifferent) attitude of the majority group towards multiculturalism; a slightly negative attitude has been reported in Spain (Medrano 2005) and the United Kingdom (Heath and Tilley 2005). Data from Spain and the UK are based on the International Social Survey Programme in which the questionnaire emphasises the aspect of cultural maintenance by immigrants. As shown in our studies, cultural maintenance is the aspect of multiculturalism that is often least supported. Canada has been one of the few countries in which the majority group has been found to actively support a policy of multiculturalism (Berry and Kalin 1995). Furthermore, evidence suggests that majority group members in Germany and Slovakia want immigrants to give up their ethnic culture (e.g. Piontkowski et al. 2000; Zick et al. 2001). In contrast, we know from numerous studies in the literature that several immigrant groups in Europe do not want to give up their culture. Although these studies did not involve a direct comparison of the majority and immigrant groups, it is fair to conclude that the results point to a problematic or even conflictual relationship in terms of the Interactive Acculturation Model (see Bourhis et al. 1997).

Before describing Dutch studies on multiculturalism, a brief detour in psychological acculturation is needed. Studies of attitudes towards multiculturalism tend to draw conceptually on acculturation models. The current most popular model of psychological acculturation (defined as the psychological consequences of prolonged contacts of cultures; see Graves 1967; Redfield et al. 1936) has been developed by John Berry (e.g. Berry and Sam 1997; see also Arends-Tóth and Van de Vijver 2006*a*, 2006*b*). The model assumes that an immigrant has to deal with two questions. The first involves cultural maintenance: "Do I find it important to maintain positive relationships with my original culture?" The second question originally involved the perceived need to establish relationships with the mainstream culture (Berry and Sam 1997) but is now often broadened to include adaptation to mainstream society (Arends-Tóth and Van de Vijver 2006*a*, 2006*b*; Bourhis et al. 1997): "Do I find it important to maintain a positive relationship with other cultures and the mainstream in society?" In both questions the relationships can involve a wide variety of life domains, such as personal relationships with co-ethnics, adherence to the religion of the ethnic culture, wearing clothing of the ethnic culture at or outside private spheres (e.g. headscarves), eating dishes from the original culture and following the daily news in the country of origin. Assuming for simplicity that both questions can be answered only with "yes" or "no", a combination of the two answers yields four acculturation orientations (Figure 1). Integration amounts to the combination of maintenance of the original culture and adaptation to the host culture (biculturalism). this is the acculturation orientation preferred by most immigrants. Separation (also labelled segregation or exclusion; Figure 1) is the orientation in which immigrants maintain good relationships with their ethnic culture and do not find it important to adapt to the host society. This strategy is often preferred in cultural enclaves such as China

towns. Assimilation is the opposite pattern, in which immigrants fully adapt to the mainstream society and gradually lose their ties with their ethnic culture. Refugees who do not have large groups of co-ethnics in the host country sometimes opt for this strategy. Finally, marginalisation (also labelled individualism; Figure 1) refers to the orientation in which immigrants do not find it important to have good relationships with either group. In practice, this orientation is usually not a matter of deliberate choice but a consequence of reactions to and from other ethnic groups. For example, marginalised Moroccan youth in the Netherlands do not hold their ancestral culture in high esteem but they also feel unaccepted by mainstream society. Compared with the other acculturation orientations, marginalisation shows the strongest relationship with negative outcomes such as depression, substance abuse and delinquency.

Figure 1: Acculturation Strategies in Berry's Model



Source: Arends-Tóth and Van de Vijver (2003).

2. Studies from the Netherlands

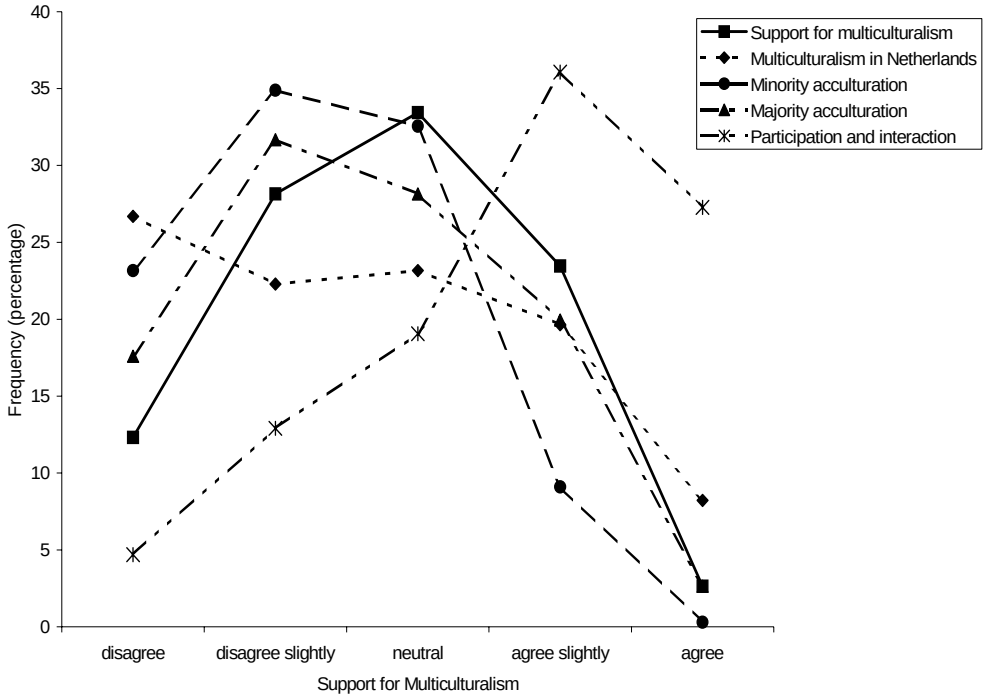
According to Berry and Kalin (1995), various conditions have to be met in order to accomplish and maintain multiculturalism in society. There should be the right mixture of diversity (respect for the uniqueness of all cultures) and unity (social cohesion and feelings of belonging to the wider, plural society). There should be support for the ideology of multiculturalism, which means that there should be contact between ethnic groups and that everybody should approve of cultural maintenance by immigrant groups. Furthermore, the society should be tolerant towards all ethnic groups and free of discrimination, and all cultural groups should have positive attitudes towards each other. Finally, all individuals should feel attached to the wider society.

We have collected data about the attitudes towards multiculturalism and acculturation orientations among mainstreamers and immigrants in various studies during the last five years. Four of these are discussed here in more detail. The first two studies addressed the views on multiculturalism by majority group members, while the last two compared the views of the majority group and immigrants. Breugelmans and Van de Vijver (2004) were interested in support for multiculturalism in Tilburg, a city of slightly less than 200,000 inhabitants (of which 15 per cent are foreign-born or have at least one foreign-born parent). Dutch mainstreamers were recruited from three neighbourhoods that differed in average income and percentage of immigrant population (the latter two variables are negatively correlated at neighbourhood level). Mail survey questionnaires were sealed in a blank envelope with prepaid return envelope included, and delivered to 1,500 randomly chosen households (500 per city district), of which 341 were returned (23 per cent). Comparison of the characteristics of the participants (age, gender, level of education and employment) with the demographic statistics of Tilburg and the individual city districts showed no notable deviations, which suggests that our sample is representative of the Tilburg population in terms of demographic characteristics. An instrument (self-completion) was developed. The 28 items were formulated as statements and followed by a 7-point Likert scale ranging from totally disagree (–3) to totally agree (+3). Items were based on questions used in the Multicultural Ideology Scale (Berry and Kalin 1995), the multicultural attitude survey by Ho (1990), the Quick Discrimination Index (Ponterotto et al. 1995) and a scale to assess attitudes towards cultural diversity and pluralism by Stanley (1996). The instrument covered four domains of multiculturalism: attitudes towards multiculturalism in Dutch society (e.g. "I feel at ease when I am in a city district with many immigrants"); attitudes towards the acculturation strategies of minority groups (e.g. "I think that immigrants should learn to speak proper Dutch"); attitudes towards acculturation strategies of the majority group (e.g. "I think that Dutch schools should think more about the cultural background of their pupils") and attitudes towards equal societal participation and interaction between majority and minority groups (e.g. "I think that immigrants and mainstreamers should have equal rights"). A letter stating the nature and purpose of the study and the institutes responsible for the study accompanied the questionnaires. Participants were requested to return the questionnaires using the anonymous return envelopes.

There were three salient findings. The first was the strong unidimensionality of the scale. The 28 items all measure the same underlying attitude (which was measured with a high reliability of 0.92). The second finding was that the mean score on the items for the sample was close to the midpoint of the scale. This indicates that the sample showed on average a neutral attitude towards multiculturalism. Furthermore, as shown in Figure 2, the distribution of scores followed the well-known bell-shaped (normal) curve. The form of the curve does not at all correspond to the view that opinions regarding multiculturalism in Dutch society are polarised and that there is a group of opponents and a group of proponents. It appears that people with more outspoken attitudes are more vocal about their views

or receive more exposure in the media. The third salient finding involved the domain specificity of attitudes towards multiculturalism. More specifically, the curve of attitudes towards equal societal participation and interaction between majority and minority groups did not follow the inverted U-shape of the other domains. It is the domain with the strongest endorsement. This suggests that exclusionist or racist positions were not endorsed by many respondents. However, cultural pluralism was also not seen as a valuable asset of Dutch society and there was little inclination to invest effort in facilitating minority integration. Age and gender were unrelated to these attitudes, but participants who were better educated and lived in more affluent neighbourhoods with fewer immigrants tended to show slightly more support for multiculturalism.

Figure 2: Frequency of Attitude Scale Scores for Support for Multiculturalism (Solid Curve) and the Four Domains (multiculturalism in the Netherlands, minority acculturation efforts, majority acculturation efforts, equal societal participation and interaction)



Source: Breugelmans and Van de Vijver (2004).

The second study (Schalk-Soekar and Van de Vijver 2006) extended the first in that a larger sample from five Tilburg neighbourhoods was included (n = 1,285) and measures of both multiculturalism and related concepts were used. Mail survey questionnaires were sent to 5,000 households (1,000 per district). The city council

of Tilburg delivered addresses of representative Dutch majority members living in the city to Tilburg University. Participants were requested to take part (voluntarily and anonymously) in this study and to return their questionnaire by mail using a post-paid return envelope. The response rate was 25.7 per cent. A slightly adapted form of the scale of the previous study was used to which two multiculturalism subscales were added. The first, Multiculturalism Advantages Subscale, involved items such as "It is good for the Netherlands to learn from the various cultures that are living in this country". The second, Multiculturalism Disadvantages Subscale, contained items such as "It is bad that the unity of the Netherlands will be lost because of the cultures of immigrants". It was found that adding these new scales did not affect the dimensionality of the scale. The overall scale remained unidimensional (with a value of 0.95, the reliability was again very high), replicating our finding that multiculturalism comprises several aspects that are strongly related. Various other related constructs were also examined:

- Social norms about perceived threat (an example of an item on the scale is: "Most people in my social environment think that city districts with many immigrants are less safe").

- Cultural maintenance (e.g. "Immigrants should pass on their own language to their children").

- Behaviour adaptation (e.g. "Immigrants adapt very well to Dutch society").

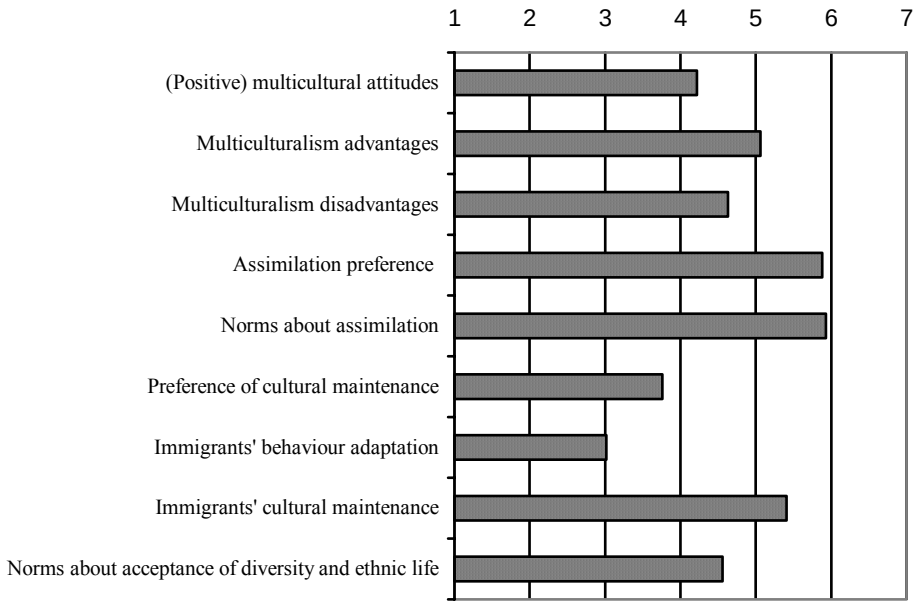
- Norms about acceptance of diversity and ethnic life (e.g. "Dutch majority group members ought to approve that immigrants speak their own language when they are together").

- Assimilation preference (e.g. "Immigrants should raise their children according to the Dutch way");

- Norms about assimilation (e.g. "Immigrants really ought to give up their own culture more").

Mean scores on the scales are presented in Figure 3. Means of 4 refer to a neutral score, scores lower than 3 to salient disagreement – a large effect according to Cohen (1988) – and score above 5 to salient agreement. The global mean of multiculturalism again pointed to a neutral attitude. Participants endorsed both the positive and negative aspects of multiculturalism. The scale dealing with behaviour adaptation by immigrants yielded the lowest scores, indicating that the majority group found immigrant groups ill-adapted to Dutch culture. The strong preference for assimilation and norms about assimilation is consistent with this finding. To summarise, participants saw both advantages and disadvantages to multiculturalism and, on average, did not have strong feelings about it although they would like to see much more adaptation by immigrants.

Figure 3: Mean Scores on Multiculturalism and Related Scales



Note: 1 = totally disagree and 7 = totally agree (all scales have a midpoint of 4 = neutral, undecided)

Source: Schalk-Soekar and Van de Vijver (2006).

A final analysis addressed the relationships between background variables (age, gender, level of education and percentage of immigrants living in the neighbourhood) and attitudes towards multiculturalism. Age showed a weak, negative relationship, which has also been found in Israel (Lewin-Epstein and Levanon 2005) and the United Kingdom (Heath and Tilley 2005). The age effect is not easy to interpret; it may be due to an intrinsic age effect (we know from developmental psychology that younger people tend to be more open than older people) or to the fact that the younger generation has grown up in a culturally heterogeneous society whereas the older generation grew up in a largely monocultural society. Women were found to be more in favour of multiculturalism than were men. These two relationships were not found in the previous study. The discrepancy may be a consequence of the much larger sample size in the current study (so that smaller correlations are significant). Furthermore, in line with the previous study, people who are better educated and those who live in neighbourhoods with fewer immigrants tend to show more endorsement of multiculturalism. The relationship of education was (again) much stronger than the relationship of neighbourhood.

The third study (Arends-Tóth and Van de Vijver 2003) involved members of both the majority group (n = 1,565) and Turkish (mainly first-generation) immigrants (n = 185) in order to compare their attitudes on multiculturalism. The Dutch

participants were members of a telepanel of a research centre in the Netherlands (CentERdata), which is assumed to be a fairly good representative sample of the mainstream population. They fill in a questionnaire about various research topics using a personal computer every two weeks. The Turkish–Dutch participants were approached using a variety of network sources, including different organisations and institutions of the Turkish–Dutch and government agencies in the southern part of the Netherlands. The response rate was 32.5 per cent. Our sample was quite similar to the Turkish population of the country in terms of age, gender and employment status; the only difference was that our sample was somewhat higher educated than the Turkish population. An adapted version of the Multicultural Ideology Scale (Berry and Kalin 1995) was administered, as well as an inventory assessing acculturation orientations for the two groups (in the group of immigrants the questions referred to preferences, while in the majority group the questions asked for their preferences as to how immigrants should deal with the two cultures). The reliability of the instruments was adequate in both groups.

The findings of the two previous studies were replicated in that the majority group distribution showed a bell-shaped curve and had a mean close to the scale midpoint, indicating a neutral attitude towards multiculturalism. Analysis of the differences at item level revealed an interesting pattern. Items about supporting and helping minorities to maintain their own cultures showed the largest differences between the majority and the Turkish-Dutch participants; the latter group expecting more support and help. Furthermore, compared with the immigrants, Dutch mainstreamers agreed more with statements about disadvantages of a diverse society (e.g. weakening the country's unity) and less with statements about its advantages (e.g. being more able to tackle problems). Finally, the majority Dutch had a neutral view of the importance of their contribution to the success of multicultural society in the Netherlands, while Turkish-Dutch were more positive.

An important difference was found between the two cultural groups in their preferred acculturation strategies in private (customs and childrearing practices) and public (participation to public life, such as education, social contacts and language use) domains. Turkish–Dutch adults made a distinction between public and private domains: integration was preferred in public life and separation in private life. Both cultural groups agreed that in public domains, Turkish migrants should adapt to Dutch culture. In private domains there was no agreement at all between the views of the majority group and the Turkish–Dutch. This combination of preferences indicates a consensual relationship in public life and a problematic relationship in private life.

The last study (Schalk-Soekar et al. 2004) examined the question of whether majority group members have an adequate insight into attitudes vis-à-vis multiculturalism of immigrant groups as well as differences of these groups. The samples came from five cultural groups, Dutch majority group members, Surinamese, Antilleans, Turks and Moroccans (about 100 participants in each group). Two scales assessed attitudes about domains in which no contact is implied

between immigrants and mainstreamers ("non-contact domain"): Immigrants' Feelings of Comfort in Living in the Netherlands (e.g. question for immigrants: "Do you feel at home in the Netherlands?", question for majority group: "Do you think that migrants feel at home in the Netherlands?"); and Cultural Maintenance (e.g. "It is preferable that all immigrants give up their culture and habits and adapt to Dutch culture"). The other two scales assessed attitudes in domains that by definition imply more contact between immigrants and mainstream members ("contact domain"): Perceived Discrimination (e.g. question for immigrants: "Do you sometimes have the feeling that you are not welcome here?", question for majority group: "Do you think that immigrants sometimes feel that they are not welcome here?") and Dutch Involvement with Immigrants (e.g. "I think that most Dutch natives know little about the culture and habits of migrants"). In line with the hypotheses (derived from Allport's contact hypothesis, 1954), we found that Dutch mainstreamers more accurately know the views of immigrant groups in domains of mutual interaction and interest (perceived discrimination by immigrants) than in domains in which there is little or no interaction (feeling at home in the Netherlands) and that the differences in attitudes of both groups are smaller in a contact domain (Dutch involvement with immigrants) than in a non-contact domain (cultural maintenance by immigrants).

A remarkable feature of this study was the correspondence between the ethnic hierarchy (perceived by the majority group) and the experiences of the immigrant groups. Other studies in the Netherlands (Hagendoorn and Hraba 1989; Schalk-Soekar and Van de Vijver 2006) have shown that mainstreamers feel different social distances towards various cultural groups. Moreover, these different social distances have a special rank order. If we ask mainstreamers to what extent they feel related (or feel fewer differences) to various cultural groups, a fixed order emerges: Surinamese, Antilleans, Turks and Moroccans. The order seems to be very consequential for the immigrant groups; in Kleinpenning's (1993) words:

> On the basis of their characteristics, some groups might be placed "further" away from the in-group than others. These groups might also be evaluated more negatively than groups that have more characteristics in common with the in-group. A sequence of preference of ethnic out-groups emerges: the ethnic hierarchy (p. 28).

The importance of ethnic hierarchy was confirmed by the current study: Groups higher in the hierarchy (such as Surinamese and Antilleans) reported on average to feel more at home in the Netherlands, to perceive less discrimination, to have a less positive attitude towards cultural maintenance and to see the Dutch majority as more involved with immigrants. Groups lower in the ethnic hierarchy (such as Turks and Moroccans) reported on average to feel less at home in the Netherlands, to perceive more discrimination, to have more a positive attitude towards cultural maintenance and to see the Dutch majority as less involved with immigrants. Moreover, we also measured actual contacts with the majority group. The ethnic hierarchy had a major impact on actual contacts. Groups that are higher in the ethnic hierarchy report more frequent contacts with the majority group.

3. Conclusions

What can be concluded from this review of studies on multiculturalism in the Netherlands? The first and most important conclusion is that, despite what has been sometimes suggested in public discourse during recent years, majority group members have on average a neutral attitude towards multiculturalism. These findings are in line with most international studies in which neutral attitudes towards multiculturalism were found (Citrin et al. 2001; Ho 1990; Zick et al. 2001). Dutch majority group members strongly feel the need for equal rights and opportunities (and absence of discrimination), but they are not inclined to invest much in the multicultural nature of society (e.g. by learning from or acquainting themselves with one or more immigrant cultures). Members of immigrant groups tend to show more support for multiculturalism. They are prepared to invest more in it and expect the same from majority group members.

Our studies do not provide any support for the view that multiculturalism is in crisis. This conclusion stands in sharp contrast to the received view in public discourse in various countries and much literature in the social sciences on multiculturalism. At least two reasons can be envisaged for the observed divergence of views about the recent state of multiculturalism in Western countries. The first is that policy-makers and the public tend to focus on negative dramatic events and are susceptible to what is known in cognitive psychology as the availability bias. It is based on Kahneman and Tversky's work in the 1970s (e.g., Tversky and Kahneman 1974). They found that people tend to overestimate the frequency, likelihood and incidence of events that are easily accessible from memory. Shiraev and Levy (2004, p. 71) describe it as the "persuasive power of vivid events". Negative events such as 9/11 and the political murders in the Netherlands tend to colour the perceived state of multiculturalism. The survey questions we administered did not ask for the impact of these events but for more basic attitudes vis-à-vis the plural composition of Dutch society, which are presumably less affected by availability bias. The second reason is more substantive. Multiculturalism is studied from different scientific perspectives. It is in line with the multifaceted nature of the concept of multiculturalism that different perspectives will not always lead to convergent conclusions.

The second conclusion involves the stability of attitudes to multiculturalism. Since 2001 three events have taken place that have supposedly had a major impact on multicultural society: the attack on the Twin Towers in 2001, the assassination of Pim Fortuyn in 2002 and that of Theo van Gogh in 2004. All led to a backlash on race relations in the Netherlands (notably on relations between Muslims and the majority group). The data collections of our study took place both before and after September 2001. In October 2004 we repeated the study by Breugelmans and Van de Vijver (2004). Although not further documented here, we found the same results (Schalk-Soekar et al. 2006). So our studies suggest that basic attitudes towards multiculturalism show a remarkable stability among the Dutch population; after the initial upheaval following dramatic events which presumably led to some drop in support, attitudes seemed to return to their original levels.

The third conclusion involves acculturation preferences. There is consistent evidence that acculturation is a domain of potential conflict of the majority and immigrant groups. The first source of a conflictual relationship is the difference in preferred acculturation orientation. We find in all our studies that immigrants to the Netherlands prefer integration (followed by separation). The same has been found by other researchers (e.g. Phalet et al. 2000; Van Oudenhoven et al. 1998). However, majority group members tend to prefer assimilation (followed by integration) (Arends-Tóth and Van de Vijver 2003; Van Oudenhoven et al. 1998). This discrepancy often boils down to the argument that majority group members expect much more adaptation to their language and culture by immigrant groups, replicating findings in other countries (Piontkowski et al. 2000; Zick et al. 2001). A second and related source of conflict may be mutual misperception. Van Oudenhoven et al. (1998) found that Dutch mainstreamers thought that immigrants (Turks and Moroccans in their study) preferred a separation strategy, while these immigrant groups indicated that they preferred integration. We also found that, especially in non-contact domains, Dutch mainstreamers do not adequately know immigrant positions with regard to acculturation issues (Schalk-Soekar et al. 2004). A final source of discrepancy is the view on domain specificity. We find in our studies that immigrant groups draw a sharp line between public and private life in that they are more inclined to adapt to Dutch culture in public life and prefer to retain their original culture in private life. However, majority group members prefer an assimilation acculturation strategy by immigrants in all domains of life.

The fourth conclusion relates to the distinction between ethnic and civic conceptions of citizenship and nation (closely related to the distinction between *Kulturnation* and *Staatsnation* and between *jus sanguinis* and *jus soli*) (Brubaker 1992; Greenfeld 1992; Medrano 2005; Medrano and Koenig 2005). Heath and Tilley (2005, p. 120) give a short description of the distinction:

> Ethnic conceptions of the nation tend to place greater emphasis on bloodlines, ancestry and cultural assimilation, that is with ascribed characteristics that are more or less fixed at birth or during early socialisation. They are concerned with people having been born and brought up in a country and likely to be associated with weaker support for multiculturalism and higher levels of concern about immigration. In contrast, civic conceptions place greater importance on aspects such as respect for political institutions, possessing national citizenship and speaking the national language. These are potentially achieved characteristics and thus open to immigrants to acquire.

Medrano (2005) questions the utility of this distinction and argues that a Weberian distinction between more restrictive and more open conceptions of nationhood and citizenship is more fruitful. Our findings have a bearing on the discussion. In each of our studies, we found strong evidence that attitudes towards multiculturalism refer to a single underlying construct. Although the items in our instruments were not meant to measure support for either ethnic or civic aspects, the unidimensionality of our findings casts doubt on the usefulness of the distinction. Individuals differ considerably in their support for multiculturalism, but (lack of) support usually permeates all aspects of the construct. Therefore, we conclude that

the distinction between ethnic and civic citizenship and nations may be useful in understanding the history and current legal framework of multiculturalism in European countries, but it is less so in understanding individual differences in attitudes towards multiculturalism.

Multiculturalism policies have changed drastically in many countries in the last thirty years. The Netherlands is a good example (Parliamentary Inquiry Committee on Integration Policy 2004). With the wisdom of hindsight, one can say that the changes in policy only tangentially reflected societal changes. We know from research that acculturation processes take a long time. After immigration it can take a few generations before a stable state is achieved. Policy-makers work on a much shorter time scale. This limitation has an impact on what they can achieve. Social science may help to formulate realistic policy aims by informing policy-makers about various aspects of acculturation, such as the expected long-term outcomes. It is difficult to escape from the impression that policy-makers in the Netherlands work from the assumption that eventually all immigrants will fully assimilate into Dutch society. However, there is ample evidence from various countries that some immigrant groups (e.g. Chinese) have been able to maintain a high ethnic vitality and cultural maintenance across many generations. It is realistic to assume that the cultural heterogeneity of the Dutch population is not a transient but a stable feature. In our view, it is important that these insights are reflected in policies and that multiculturalism is seen as a topic that requires a multidisciplinary endeavour. Multiculturalism policies cannot deviate much from public attitudes and should start from a profound knowledge of these attitudes. Evidence-based policies require the concerted action of policy-oriented, management-oriented and behaviour-oriented sciences. The study of multiculturalism requires an adequate "management of diversity" of the approaches and findings of the various sciences studying this topic.

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