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OECD Reviews of Higher Education in Regional and City Development

Amsterdam, Netherlands

SELF-EVALUATION REPORT

SEO Economisch Onderzoek

Directorate for Education
Programme on Institutional Management
in Higher Education (IMHE)

This report was prepared by SEO Economisch Onderzoek in collaboration with a number of higher education institutions in Amsterdam as an input to the OECD Review of Higher Education in Regional and City Development. It was prepared in response to guidelines provided by the OECD to all participating regions. The guidelines encouraged constructive and critical evaluation of the policies, practices and strategies in HEIs' regional engagement. The opinions expressed are not necessarily those of SEO Economisch Onderzoek, the OECD or its Member countries

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Amsterdam, november, 2009

Review of higher education institutions in Regional and city development

Self-evaluation report of Amsterdam

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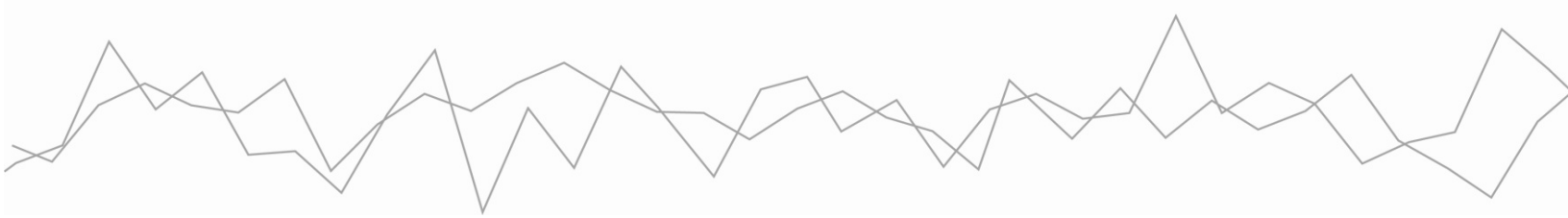
Theo Smid

seo economisch onderzoek



“De wetenschap dat het goed is”

SEO Economisch Onderzoek doet onafhankelijk toegepast onderzoek in opdracht van overheid en bedrijfsleven. Ons onderzoek helpt onze opdrachtgevers bij het nemen van beslissingen. SEO Economisch Onderzoek is gelieerd aan de Universiteit van Amsterdam. Dat geeft ons zicht op de nieuwste wetenschappelijke methoden. We hebben geen winstoogmerk en investeren continu in het intellectueel kapitaal van de medewerkers via promotietrajecten, het uitbrengen van wetenschappelijke publicaties, kennisnetwerken en congresbezoek.

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LIST OF ACRONYMS

ACE	Amsterdam Center for Entrepreneurship
ACS	Amsterdam Center of Conflict Studies
ACTA	*Academisch Centrum Tandheelkunde Amsterdam*
AGSS	Amsterdam Graduate School of Science
AHK	*Amsterdamse Hogeschool voor de Kunsten*
AIM	*Amsterdamse Innovatiemotor* (Amsterdam Innovation Motor)
AMA	Amsterdam Metropolitan Area
AMC	*Academisch Medisch Centrum Universiteit van Amsterdam* (Academic Medical Center University of Amsterdam)
AMSI	Amsterdam Centre for Service Innovation
AMS-IX	Amsterdam Internet Exchange
ARWU	Academic Ranking of World Universities
AUC	Amsterdam University College
AWT	*Adviesraad voor het Wetenschaps- en Technologiebeleid* (Advisory Council for Science and Technology Policy)
BKT	*Bureau Kennistransfer UvA* (Bureau Knowledge Transfer UvA)
BOOT	*Buurtwinkel, Onderwijs, Onderzoek en Talentontwikkeling*
CASE	Center of Amsterdam Schools for Entrepreneurship
CCAA	Creative Cities Amsterdam Area
CIS	VU Center for International Development
CNV	*Christelijk Nationaal Vakverbond* (Federation of Christian Trade Unions)
COROP	*Coördinatie Commissie Regionaal OnderzoeksProgramma*
CPB	*Centraal Planbureau* (Netherlands Bureau for Economic Policy Analysis)
CWI	*Centrum voor Werk en Inkomen* (Center for Work and Income)
DALY	Disability Adjusted Life Years
DSF	Duisenberg School of Finance
EPO	European Patent Office
FNV	*Federatie Nederlandse Vakbeweging* (Federation of Dutch Labor Unions)
FP7	Seventh Framework Programme
GDP	Gross Domestic Product
GVA	Gross Value Added
HBO	*Hoger Beroepsonderwijs*
HEI	Higher Education Institution
HAVO	*Hoger Algemeen Voortgezet Onderwijs* (Higher General Continuing Education)
HvA	*Hogeschool van Amsterdam*
INHolland	*Hogeschool INHolland*
IP	Intellectual Property
IPA	Intellectual Property Act
IPR	Intellectual Property Rights
IVM	*Instituut voor Milieuvraagstukken* (Institute for Environmental Studies)
KKA	*Kenniskring Amsterdam* (Knowledge Circle Amsterdam)
KIA	*Kennisinvesteringsagenda* (Knowledge Investment Agenda)
KNAW	*Koninklijke Nederlandse Akademie van Wetenschappen* (Royal Netherlands Academy of Arts and Sciences)
KVK	*Kamer van Koophandel* (Netherlands Chamber of Commerce)
LNV	Ministry of Agriculture, Nature and Food Quality
LSBU	London South Bank University

LSCA	Life Sciences Center Amsterdam
MBO	*Middelbaar Beroepsonderwijs* (Middle Level Vocational Education)
MKB-Nederland	*Koninklijke Vereniging Midden- en Kleinbedrijf Nederland* (Royal Association MKB Nederland)
NFTA	*Netherlands Film and Television Academy*
NISB	Netherlands Institute for Systems Biology
NKI	*Nederlands Kanker Instituut* (Netherlands Cancer Institute)
NVAO	*Nederlands-Vlaamse Accreditatieorganisatie* (Netherlands-Flanders Accreditation Organization)
NWO	*Nederlandse Organisatie voor Wetenschappelijk Onderzoek* (Netherlands Organization for Scientific Research)
OCW	Ministry of Education, Culture and Science
PAO	*Platform Arbeidsmarkt en Onderwijs* (Platform Labor Market and Education)
PRES	*Platform Regionaal-Economische Structuur* (Platform for Regional Economic Structure)
RAAK	*Regionale Aandacht en Actie voor Kennisdeling*
RELATE	Research Network for International Economics, Logistics and Technology
RIS	*Regionale Innovatiestrategie* (Regional Innovation Strategy)
ROA	*Researchcentrum voor Onderwijs en Arbeidsmarkt* (Research Center for Education and the Labor Market)
ROC	*Regionaal Opleidingscentrum* (Regional Education Center)
SBIR	Small Business Investment Research Regulation
SEA	Strategic Agenda for the Economic Domain
SER	*Sociaal-Economische Raad* (Social Economic Council)
SKE	*Subsidieprogramma Kennisexploitatie* (Subsidy Programme Knowledge Exploitation)
SKO	*Stichting Kennisontwikkeling HBO*
SME	Small and Medium Enterprises
STW	*Technologiestichting* (Technology Foundation)
THES	The Times Higher Education Supplement
TNO	Organization for Applied Scientific Research
TTO	Technology Transfer Office
UAS	University of Applied Science
UvA	*Universiteit van Amsterdam* (University of Amsterdam)
VMBO	*Voorbereidend Middelbaar Beroepsonderwijs* (Preparatory Middle Level Vocational Education)
VNO-NCW	*Verbond Nederlandse Ondernemingen-Nederlands Christelijk Werkgeversverbond* (Confederation of Netherlands Industry and Employers)
VSNU	*Vereniging van Nederlandse Universiteiten* (Association of Universities in the Netherlands)
VWO	*Voorbereidend Wetenschappelijk Onderwijs* (Preparatory Scientific Education)
VU	*Vrije Universiteit* (VU University)
VULA	VU Law Academy
VUmc	*Vrije Universiteit medisch centrum* (VU University medical center)
WO	*Wetenschappelijk Onderwijs* (Scientific Education)

EXECUTIVE SUMMARY

Aim and scope of this study

This report forms the contribution of the Amsterdam region to the OECD reviews of higher education in regional and city development. In the period 2008-2010 the OECD is executing a second round of reviews of 15 regions world wide. The aim of these reviews is to study the contribution of higher education and research to regional and city development. The background of this question is that in order to be competitive in the globalizing knowledge economy, the OECD countries need to invest in their innovation systems at the national *and* regional levels. Traditionally, the emphasis in innovation and educational policy has been on national goals or on the pursuit of knowledge with little regard for the surrounding environment. This is now changing. There is a growing awareness that higher education institutions must do more than simply educate and research. The impact they are making in the world starts at their doorstep and concerns their own city or region. To be able to play their regional role the higher education institutions must engage with others in their regions, provide opportunities for life long learning, collaborate with the business community to boost innovation and contribute to the development of knowledge-intensive jobs with added value to the community at large. This has implications for all aspects of these institutions' activities – teaching, research and service to the community and for the policy and regulatory framework in which they operate.

How can higher education institutions live up to this challenge? The OECD reviews aim to explore policy measures and institutional reforms that can help them do so. The report on the first round of reviews in 2005-2007 provided many suggestions for improvement (see OECD, 2007b). The second round of reviews deepens the analysis by including city development as a more explicit theme and offers a new set of regions world wide the opportunity to undergo the process of self-reflection and peer review aimed at improving the contribution of higher education to regional and city development.

For each region, the review is made up of three steps. The starting point for the review is a self-evaluation report drawn up by the region. For this report the OECD has provided a set of guidelines indicating which questions should be answered and how the answers should be formulated (in terms of style and contents). The second step consists of a visit of a peer review team which interviews the main regional stakeholders and conducts research on the basis of the self-evaluation report. Thirdly, the findings of the peer review committee are communicated to the region in an advisory report. Finally, the general lessons of all reviews are brought together in a separate OECD study.

This document forms the self-evaluation report of the review partners in the Amsterdam region. The partners taking part in this review are the Vrije Universiteit Amsterdam, the University of Amsterdam, the Hogeschool van Amsterdam, Hogeschool INHolland, the City community of Amsterdam, the Chamber of Commerce and ING-Bank. SEO Economisch Onderzoek was asked to write the self-evaluation report on behalf of these partners. For practical purposes, a sounding board was formed with representatives from all participating organizations. This project team was chaired by the regional coordinator for Amsterdam, prof. dr. P. Nijkamp from the Vrije Universiteit. Mr. M. Draisma of the Vrije Universiteit Amsterdam acted as liaison officer and contact person for the region.

Conclusions

A main purpose of this report is fact finding. It reports many details concerning the interaction between the higher education sector in the Amsterdam metropolitan area and other stakeholders

such as regional authorities and the business community. Together these organizations form the main pillars for the social, economic and cultural development of the region. The facts collected are subsequently used in the analytical part of this report, which consists of three SWOT-analyses covering the contribution of higher education in Amsterdam to (1) regional innovation, (2) employment and knowledge skills and (3) social, cultural and environmental development.

The main finding of these SWOT-analyses is that higher education is an important driver for the region's prosperity and well-being, but that the 'fruits' of higher education are not used in the most optimal way. The higher education institutions in the Amsterdam region offer high quality research and infrastructures which should be used in a more profitable way. In particular, it can be used more consistently to boost the competitive strength of the metropolitan area. There are few weaknesses which cause the Amsterdam region to fall back compared to its peers in the world economy. However, there are also few strengths which give Amsterdam a leading position in the world. Notable examples are its internet and digital infrastructure and specific parts of the cultural complex in the Amsterdam area. If the metropolitan area wants to succeed in becoming one of the leading global business gateways of the world, more needs to be done. In particular, the region needs to excel in more areas than the digital infrastructure and the higher education institutions are the linking pin to achieve this goal.

The policy agenda needed to improve the contribution of higher eduction institutions to the region's development can be summarized in terms of the following four challenges:

The *first* challenge is to give all the initiatives for increased innovation which are currently blossoming in the Amsterdam region sufficient 'focus and mass'. Without these qualities the now emerging innovative clusters will fail to generate the added value to the regional economy which is expected from them. The ICT and Life Sciences clusters are probably farthest in achieving this aim, but for the sustainable development cluster this is unsure. The challenge facing the partners in the Amsterdam region is to focus more clearly on what they want to achieve as a common goal. This starts with a common agenda instead of the three or four separate innovation strategies which currently dominate the scene. The bottom-up approach has greatly worked in getting many innovation coalitions off the ground. In the next phase of development it may be time for a turn to a more top-down approach of public leadership (including the HEIs) for making the coalitions more effective.

The *second* challenge concerns a precondition for reaching focus and mass: the region needs to attract more R&D-investment. There is a lot of first class scientific research in the region, but this abundance somehow does not materialize in high R&D-investment in the business sector in the Amsterdam metropolitan area. This indicates that the relationships between the HEI-sector and the business community need to be tightened. This is partly a matter of making the research agenda of the HEIs more demand driven. The traditional view of HEIs is developing research programs on the basis of their own scientific strengths and interests and the national research funding mechanism hardly forces them to change tactics and focus more clearly on community needs. Recently founded facilities like the TTOs, the Science Park Amsterdam and colloborate initiatives like the Amsterdam BioMed cluster and the Duisenberg School of Finance indicate that the HEIs are working to achieve a turnaround. But more is needed to boost innovative capacity as a general quality of the region and that requires stronger demand driven incentives for research and education.

The reverse side of this coin is that the business community in the Amsterdam area needs to operate more proactive when it comes to finding the right knowledge partner for innovation. The Amsterdam HEIs have much to offer in terms of knowledge and skills and the local business community needs to be much more aware of the added value of collaboration. There are new

institutions in place such as *Kennispoort Amsterdam* which forms an interface between the knowledge institutions and the corporate sector. This may improve the access for firms to the knowledge base at HEIs. But such initiatives will fail to have impact when businesses do not in first instance feel the urge and necessity to innovate their production processes and product lines and seek assistance from the HEIs to do so. It is here that the corporate sector in the Amsterdam metropolitan area can make more progress than is currently the case.

The *third challenge* is to establish effective regional learning systems as a means to counter negative social effects from a divided labor market, favoring the opportunities for the higher educated but with bleak prospects for the lower end of the labor market. The HEIs are already taking steps to build more effective regional learning systems, but the coalition supporting such systems should be broadened and must for example include the business community, intermediary organizations in the labor market and social security organizations. As a side effect, this may help promote the cause of life-long learning which also benefits from more effective regional learning systems.

The *fourth challenge* is to adopt an integrated approach to the labor market. In the city of Amsterdam urban sprawl reduces the growth of labor supply and in its track that of employment opportunities. The difficult housing market in the city combined with the mounting problems of commuter traffic may deepen these effects of urban sprawl. This poses a serious threat to the competitive position of the economy in the whole metropolitan area in the mid and long term. It also undermines the contribution of the HEIs to regional development due to the risk of a human capital flight. Such risks require close monitoring. How do the demand and supply of higher education develop in the region? What is the labor market position of higher education graduates? These are developments which the HEIs should monitor more closely in order to safeguard their positions. The HEIs should be aware of the options open to them to improve their quality as national and international talent magnets. In addition, coalition formation is called for to effectively tackle the bottlenecks which hinder the development of the regional knowledge-based economy.

These four challenges provide input for a regional action plan for the Amsterdam metropolitan area placing HEIs centre stage. This agenda should try to promote increasing returns of scale in the region, which can be achieved by establishing close ties between emerging technologies in promising economic sectors such as the life sciences and the ICT-sector. In addition the opportunities for non-technological innovation should be boosted which for Amsterdam are abundantly found in the cultural complex. Culture and education are two of the key factors for turning Amsterdam into a talent magnet of national and international importance. All stakeholders in the region should recognize the added value of the attraction of the region for knowledge intensive businesses, highly educated workers and talented scientists. The action plan for the region must include measures to maximize the attraction force of this magnet, perhaps in the form of a pact or convenant between all parties concerned. The HEIs in the Amsterdam area should take a lead in establishing those ties, but it also requires the cooperation of the business sector and stresses the importance of valorization and entrepreneurship. Concerning this latter aspect it is of the highest importance that Amsterdam not only becomes the city of teaching and learning, but also the city of entrepreneurship it once was.

1. OVERVIEW OF THE REGION

1.1 Introduction

This chapter gives a bird's eye view of the Amsterdam metropolitan region. Key issues that will be discussed are:

- The position of the Amsterdam metropolitan region in an (inter)national hierarchy of cities and regions;
- The demography of the metropolitan region;
- The industrial/employment structure of the Amsterdam region and the labor market position of higher education graduates;
- Distinguishing social and cultural characteristics of the region;
- The structure of central, regional and local government in the region.

Section 1.2 discusses the geographical situation of the Amsterdam metropolitan region as well as its position in an (inter)national hierarchy of cities and regions. Section 1.3 presents some key demographic figures. Section 1.4 focuses on the economic and social base of the metropolitan region. Important issues are the industrial/employment structure of the region and how this relates to higher education provision. Finally, section 1.5 discusses the governance structure of the Netherlands and the Amsterdam metropolitan region in particular.

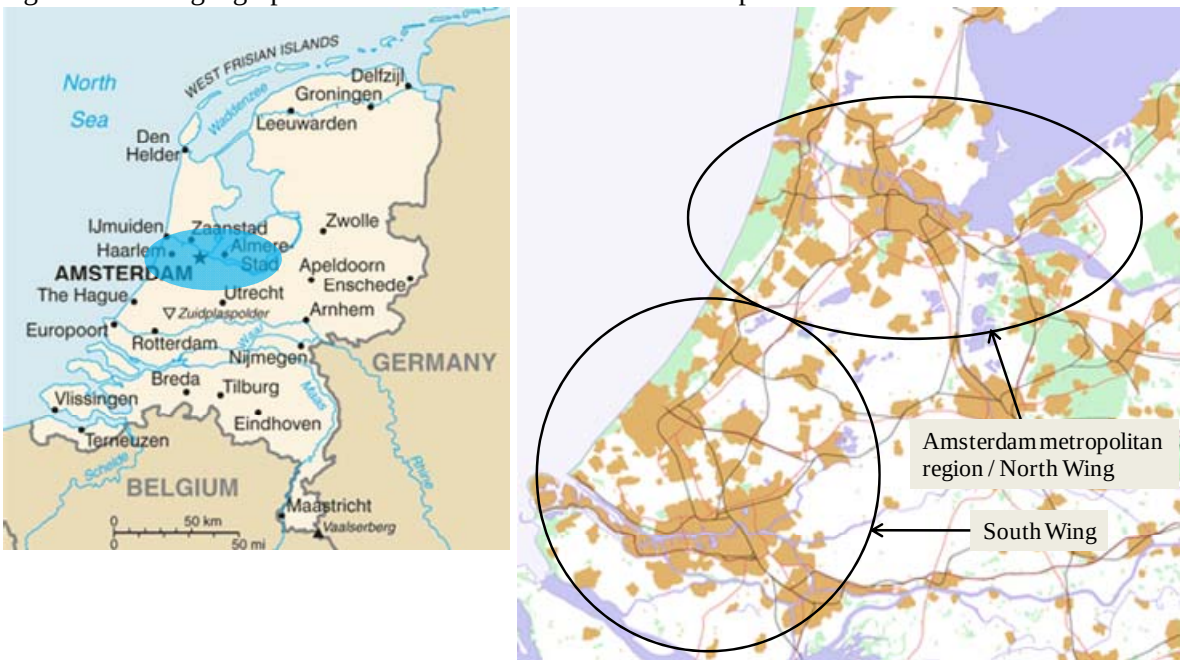
1.2 The geographical situation

1.2.1 Location of the Amsterdam metropolitan area

The Amsterdam metropolitan area (*Metropoolregio Amsterdam*) is located in the Western part of the Netherlands and roughly covers the area from Zeevang to Heemskerk, from the Haarlemmermeer to Uithoorn and from Hilversum to Almere. The Amsterdam metropolitan area is the new governance term for the *Noordvleugel* (North Wing) of the Randstad (Regiegroep Noordvleugel 2040, 2008). The Amsterdam metropolitan area (or North Wing) is the Northern part of the Randstad area, whereas the Southern part of the Randstad is called the South Wing and is centered around the cities of Rotterdam and The Hague. Both wings cover a surface that is larger than a city-region, but do not fall within the boundaries of a province and may stretch beyond its borders depending on the geographical definition used (OECD, 2007a: 173). There is no common demarcation of either wing; indeed, several definitions as to which cities and municipalities are included in the respective wings exist (ibid: 173). That the definitions of the wings are fluid is also demonstrated by the fact that Utrecht originally used to belong to the North Wing, but no longer does so as it decided to leave the North Wing co-operative arrangement (platform) (ibid: 173). The central government, however, still uses a definition of the North Wing that includes the area Utrecht-Amersfoort as well (MinEZ, 2009b: 4). In the remainder, however, we will follow the definition of North Wing/Amsterdam Metropolitan region as formulated by the *Regiegroep Noordvleugel 2040* (i.e. without Utrecht and Amersfoort).
Similar to the North Wing, the Amsterdam metropolitan area is a collaboration of regional and local authorities in the Northern part of the Randstad. Currently the Amsterdam metropolitan area includes the capital city of Amsterdam as well as 35 surrounding municipalities located in the provinces of Noord-Holland and Flevoland. The following local authorities are members: Aalsmeer, Almere, Amstelveen, Amsterdam, Beemster, Bennebroek, Beverwijk, Blaricum,

Bloemendaal, Bussum, Diemen, Edam-Volendam, Haarlem, Haarlemmerliede-Spaarnwoude, Haarlemmermeer, Heemskerk, Heemstede, Hilversum, Huizen, Landsmeer, Laren, Muiden, Naarden, Oostzaan, Ouder-Amstel, Purmerend, Uitgeest, Uithoorn, Velsen, Waterland, Weesp, Wijdemeren, Wormerland, Zaanstad, Zandvoort, Zeevang, the provinces of Noord-Holland and Flevoland, and the city region of Amsterdam. Annex A gives a picture of the municipalities that make up the Amsterdam metropolitan area. The Amsterdam metropolitan region has 2.2 million inhabitants, which amounts to roughly 13% of the total Dutch population. About 747,000 people are living in the city of Amsterdam.

Figure 1-1: The geographical location of the Amsterdam metropolitan area



Source: CIA World Factbook (2009), O+S Amsterdam (2007a)

The Amsterdam metropolitan region serves as an important gateway for goods and services. It includes one airport, *Schiphol*, which takes the 12th place among international airports in terms of passenger travel (Airports Council International, 2008). Schiphol airport experienced a total passenger flow of 47.4 million passengers in 2008 (Schiphol Group, 2009). A vast network of highways connects the Amsterdam metropolitan area with the rest of the Netherlands as well as the further European hinterland. The harbor of Amsterdam is the second-largest (after Rotterdam) of the Netherlands and the 4th port of Europe. It had a throughput of 85 million tons of goods in 2007 (Port of Amsterdam, 2007). The Amsterdam metropolitan region is also easily accessible by train. The city of Amsterdam is geographically close to the three other major cities of Rotterdam, Utrecht and The Hague, which are all located within a distance of 75 kilometers. Furthermore, international intercity trains to major cities in Germany, Belgium and France leave from Amsterdam and Hilversum. A high-speed railway (HSL-Zuid) which directly connects airport Schiphol to Rotterdam and Antwerp will enter into use in 2009. Due to this high-speed railway, one can travel to Antwerp in one hour, to Brussels in 1 hr and 37 mins and to Paris in 2 hrs and 57 mins. Hannover can be reached in 4 hrs and 21 mins and Berlin in 6 hrs and 11 mins. The municipality of Amsterdam is also developing a number of large infrastructural projects in and around Amsterdam itself. Amsterdam is building the Noord/Zuidlijn, a subway connection between the North and South of Amsterdam. It is also renovating the Wibautas, which connects

the southEastern part of Amsterdam to the inner city. Amsterdam is also planning on building a new tunnel beneath the river IJ, which will connect the North of Amsterdam with the city center. Despite all these new projects, the road traffic in and around Amsterdam is very congested. Traffic jams are very common on the highway A10 (which runs around the city) and the Coentunnel (which connects the North to the city center). The Amsterdam metropolitan area also has a highly developed digital infrastructure. The city of Amsterdam takes the 1st place among European cities in terms of internet traffic (Euro-IX, 2008). The aggregated peak traffic through Amsterdam's internet exchange points amounted to 441 gigabits per second, thereby constituting slightly less than 25% of the total European data traffic.

1.2.2 The Amsterdam metropolitan area in perspective

Table 1-1 shows the position of the Amsterdam metropolitan region in a national hierarchy of urban regions in terms of gross regional product and population size. The urban regions included in the table, except for the Amsterdam metropolitan area itself, are defined according to the COROP-classification. This classification follows the principle that each urban region has a 'core' (for instance a city) as well as a surrounding area which economically depends on it. The Amsterdam metropolitan region spans an area that is larger than the COROP area that pertains to the Amsterdam region. It thus covers multiple COROP areas. Data on the gross regional product of the Amsterdam metropolitan area are not available, so this is replaced by the gross regional product of the greater Amsterdam region which is part of the COROP classification. With a regional domestic product of EUR 61.7 billion in 2006, the greater Amsterdam region is the largest economic region in the Netherlands. Furthermore, with a population of 1.2 million it is also the second-largest region (after the Groot-Rijnmond region) in terms of the number of inhabitants. The Amsterdam metropolitan region is also one of the most densely populated regions in the Netherlands. Groot-Amsterdam also outstrips the Netherlands as a whole when it comes to GDP per capita and GVA per capita (see Annex C, table C-1 and C-2). The gap in GDP per capita and GVA per capita between Groot-Amsterdam and the Netherlands is even increasing over time.

Table 1-1: The Amsterdam metropolitan region in a national perspective

Region	Gross regional product (billion EUR) (2006)	Population (2008)
Groot-Amsterdam (CR)*	**61.66**	**1,222,305**
Groot-Rijnmond (CR)	48.44	1,360,610
Utrecht (CR)	46.1	1,201,350
Agglomeratie 's-Gravenhage (CR)	28.43	784,405
Zuidoost-Noord-Brabant (CR)	23.72	729,887
West-Noord-Brabant (CR)	21.78	609,544
Noordoost-Noord-Brabant (CR)	20.97	631,183
Overig Groningen (CR)	20.19	370,249
Arnhem / Nijmegen (CR)	19.5	699,966
Zuid-Limburg (CR)	18.49	610,868

* Due to the lack of data on the level of the Amsterdam metropolitan region, the gross regional product presented in the table is for the geographically smaller greater Amsterdam region (consisting of the COROP areas Amsterdam, Overige agglomeratie Amsterdam, Edam-Volendam e.o. and Haarlemmermeer e.o.)

Source: Statistics Netherlands Statline (2006a), Statistics Netherlands Statline (2008a)

In an international perspective, the greater Amsterdam region takes the 53rd place in the hierarchy of European regions according to the size of regional domestic product (see Annex C, table D-3). In terms of its economic size, the greater Amsterdam region is comparable to the Münster region (Germany) and the Brussels region (Belgium). In terms of population, the Amsterdam metropolitan area takes the 191st place. In this respect, the Amsterdam metropolitan region is comparable to regions such as Midtjylland (Denmark) and Dorset and Somerset (United Kingdom).

According to the European Cities Monitor 2008, the city of Amsterdam takes the 6th place after London, Paris, Frankfurt, Brussels and Barcelona, in a hierarchy of 34 European cities (Cushman & Wakefield, 2008: 9). In terms of a list of pull-factors for businesses, Amsterdam scores high on the factor "languages spoken", for which it is the second-most attractive city (after London) in Europe. On all the other pull-factors, Amsterdam takes lower places in the hierarchy. It scores lowest on the factor "availability of office space" (17th place). On what is considered the most important pull-factor for businesses, "availability of qualified staff", Amsterdam ranks 5th. A recent report from the Boston Consultancy Group, however, shows that over the last 15 years Amsterdam has lost its competitive edge against several other European cities such as Barcelona, Berlin and Madrid (BCG, 2008: 26). Particularly in terms of accessibility, crime and air pollution, the international position of Amsterdam has worsened. The municipality of Amsterdam aims to counter this trend by bringing the city back into the European top 5 of most attractive business locations. With the project *Amsterdam Topstad*, the municipality tries to improve the international reputation of Amsterdam by emphasizing its key characteristics: creativity, innovativeness and trade spirit. It also wants to attract more international visitors by organizing new events. Other key priorities are to further strengthen the local economy as well as improving the international business climate. The municipality also runs an "Investor Development" programme. This programme is established to prevent that important national and international companies move their activities elsewhere and to stimulate these companies to expand their investments in the Amsterdam region. In order to achieve this aim, the municipality of Amsterdam gives more direct support to businesses, for instance by appointing a business relationship manager for the 300 most important foreign and the 50 most important national companies.

1.2.3 The settlement structure

With a population of 747,093 the municipality of Amsterdam is the urban core of the Amsterdam metropolitan region. Another urban center is the municipality of Almere, which is located in the northeast of the Amsterdam metropolitan area and has 183,270 in habitants. Also the municipality of Zaanstad, which borders Amsterdam in the North and has a population of 142,863, is one of the urban cores of the region. The municipality of Haarlem, with a population of 147,640 and located in the West of the Amsterdam metropolitan region, is another urban center. A final urban center is the municipality of Haarlemmermeer, located in the South-West of the Amsterdam metropolitan area, with a population of 140,648. The Amsterdam metropolitan region is characterized by dense flows of traffic, which is mainly concentrated around the city of Amsterdam. On a daily basis, 189,000 people commute to Amsterdam to work and 89,000 inhabitants of Amsterdam leave the city to work elsewhere. The largest inflow of commuters stems from the cities of Almere, Zaanstad and Purmerend. About half of the Amsterdam metropolitan area inhabitants travel to work in Amsterdam by car. Of the people living in Amsterdam who have a job in the region, only one third uses a car to travel to work. Due to the

relatively bad accessibility of the inner city of Amsterdam and traffic jams in and around Amsterdam, most inhabitants of Amsterdam choose to travel by bike or public transport.

Closely related to the daily flow of commuters moving out of Amsterdam is the process of suburbanization. The Amsterdam region is facing a migration deficit for businesses in terms of the number of businesses as well as the number of individuals employed at those businesses (EZ Amsterdam, 2006). To counter this trend, the city of Amsterdam is heavily investing in the development of office space. Its largest and most prestigious project is the development of the Zuidas business district along the A10 highway in Southern Amsterdam. At this moment the Zuidas district has 270,000 m^2 of office space and provides for 30,000 jobs. Located on the Zuidas are mainly financial institutions and professional services firms, as well as VU University Amsterdam and VUmc medical center. In addition, the municipality also invests in the development of office space in other areas in Amsterdam, particularly in the boroughs Westpoort, Zuidoost and Noord. Estimates from 2005 indicate that the municipality of Amsterdam has created enough development capacity to increase the amount of office space with 56% if necessary. The boroughs Westpoort and Zuidoost are characterized by large business districts. The borough Noord is a hotspot for the creative industry, which accounts for a substantial share of the growth in business locations and employment there (TNO, 2004).

1.2.4 Location of Higher Education Institutes

The Amsterdam metropolitan region has a high concentration of Higher Education Institutions (HEIs). Most HEIs are located in the capital city of Amsterdam. The largest ones are the VU University Amsterdam, University of Amsterdam, Hogeschool INHolland and Hogeschool van Amsterdam. A number of higher education institutes have multiple locations in the Amsterdam metropolitan area: Hogeschool INHolland, Hogeschool van Amsterdam, Hogeschool IPABO, Hogeschool Markus Verbeek, Hogeschool TIO, Hogeschool Praehep, Stichting Hoger Onderwijs NOVI, Hogeschool Thorbecke and Hogeschool Haarlem. There is also the opportunity of distance learning. In 1984, the Open University of the Netherlands was established in order to offer adults a means of pursuing higher education without formal admission requirements and at their own pace, through distance education (MinOCW, 2007a: 68). The Open University may offer both HBO and university courses. HBO is the Dutch equivalent for University of Applied Sciences (hereafter UAS). Other popular institutes that offer courses at HBO or university level by distance learning are the Leidse Onderwijsinstellingen (LOI) and NCOI. Like the Open University, they often do not demand a particular educational background from their students.

Table 1-2: Higher Education Institutions in the Amsterdam metropolitan region

Institution	City	Type of HEI	Institutional type
University of Amsterdam	Amsterdam	University	Multi-sector
VU University Amsterdam	Amsterdam	University	Multi-sector
Hogeschool van Amsterdam	Amsterdam, Almere	UAS	Multi-sector
Hogeschool INHolland	Amstelveen, Amsterdam, Diemen, Haarlem and Velsen	UAS	Multi-sector
Gerrit Rietveld Academie	Amsterdam	UAS	Mono-sector (arts)

Amsterdamse Hogeschool voor de Kunsten	Amsterdam	UAS	Mono-sector (arts)
Hogeschool IPABO	Amsterdam, Almere		Multi-sector
St. Amsterdamse Balletacademie	Amsterdam	UAS	Mono-sector (arts)
Hogeschool Markus Verbeek	Alkmaar, Almere, Amsterdam, Haarlem and Zaanstad	UAS	Mono-sector (business administration)
Hogeschool TIO	Amsterdam, Haarlem	UAS	Mono-sector (hospitality and tourism)
Hogeschool Praehep	Amsterdam, Almere, Haarlem and Zaanstad	UAS	Mono-sector (economics)
Stichting Hoger Onderwijs NOVI	Amsterdam, Almere and Zaanstad	UAS	Multi-sector
Hogeschool Thorbecke	Amsterdam and Haarlem	UAS	Mono-sector (economics)
Hogeschool Haarlem	Haarlem and Amsterdam	UAS	Multi-sector

Source: IB-Groep (2009)

1.3 The demographic situation

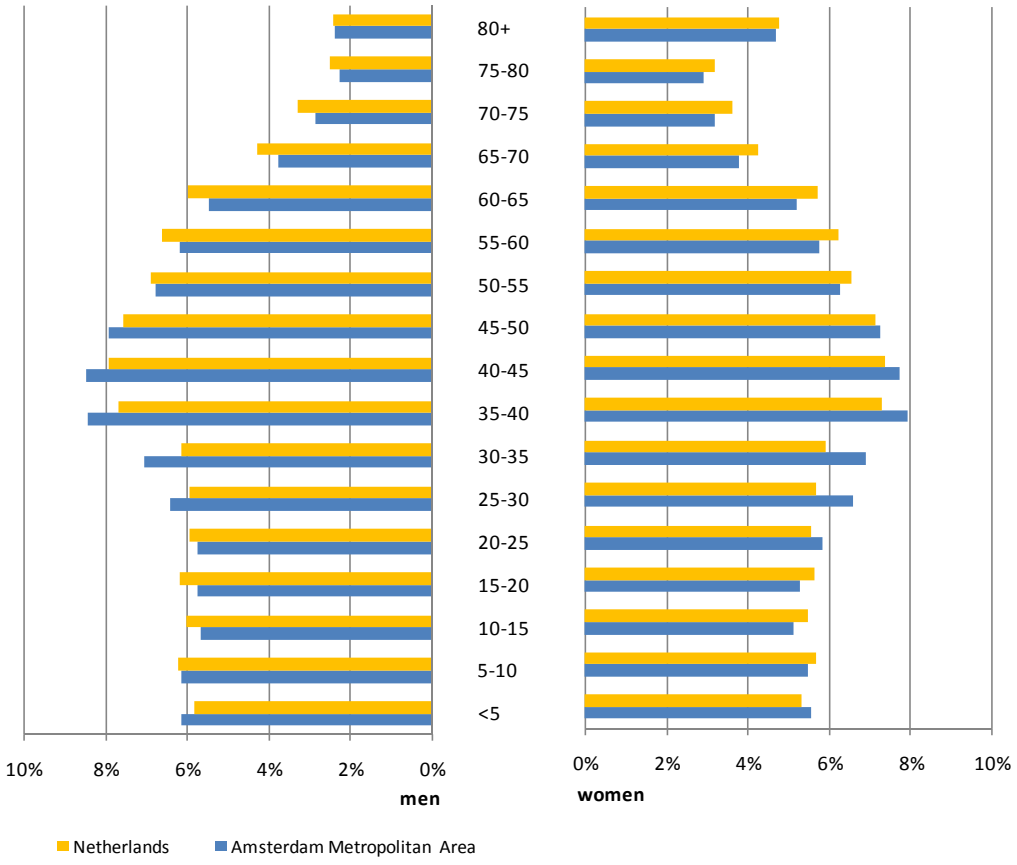
1.3.1 Age structure and migration

The age structure of the inhabitants of the Amsterdam metropolitan area, as shown in Figure 1-2: Population by age and genderFigure 1-2, indicates that the percentage of individuals of age 25-50 exceeds the Dutch average, whereas most of the younger (5-20) and older (50-80+) cohorts are underrepresented compared to the national average. One reason is the presence of the city of Amsterdam, which is the place where many people choose to work or study. Another reason is that municipalities such as Almere and Haarlemmermeer have relatively new housing, which attracts many young families. The Amsterdam metropolitan region faces a stronger population growth than the rest of the Netherlands. In 2007, the population of the Amsterdam metropolitan area increased by 14,000 people, which is mainly attributable to high birth rates. The fastest growing municipality was Amsterdam, which had a population increase of 4,209. This is the continuation of a trend visible for years now, although the pace of population growth fluctuates strongly over time. Other strong population growth is found in the municipalities of Almere (a growth of 2,346) and Haarlemmermeer (2,393).

The net migration rate of the Amsterdam metropolitan region from foreign countries as well as from other parts of the Netherlands has varied strongly over the last two decades (Figure 1-3). The net migration rate from foreign countries has been positive over most of these years, except for 1995, 1996, 2005 and 2006. In 2006, the net migration rate was at its lowest level of the last two decades: -6,300. The net migration rate from other parts of the Netherlands shows equally strong variation over the last twenty years, although it is smaller in absolute value than the foreign net migration rate. The domestic net migration rate has also been positive for most of the years, except for the period 2000-02. In 2007, the net migration rate in the Amsterdam

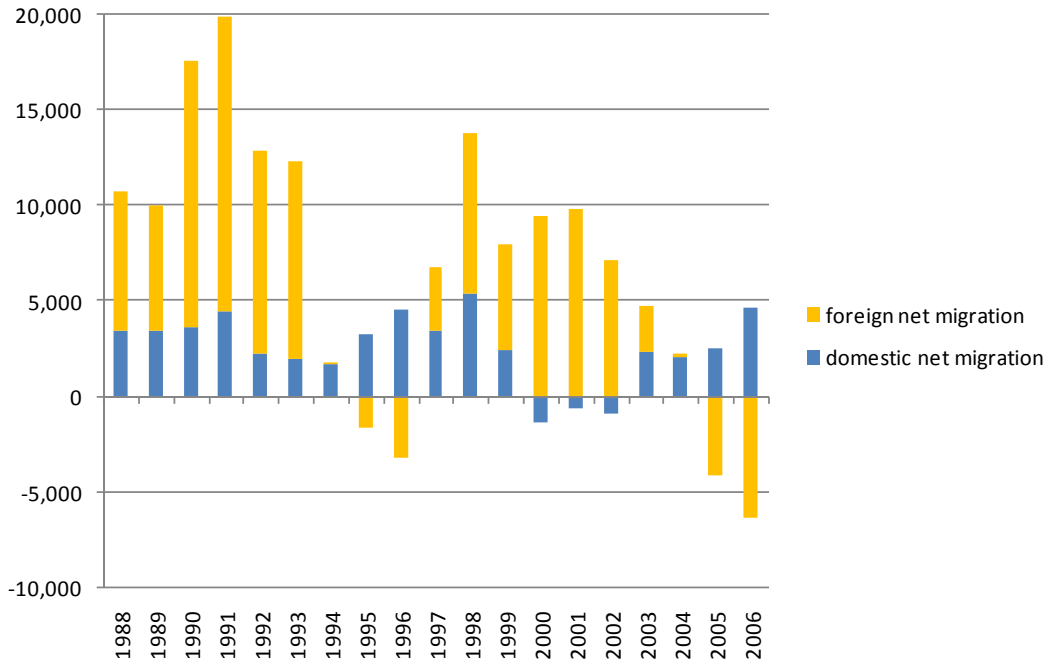
metropolitan area exceeded that of other parts of the Netherlands by 4,200 people. With regard to the near future, projections indicate that the population of the Amsterdam metropolitan region will grow faster than the aggregate Dutch population. It is expected that the number of inhabitants of the Amsterdam metropolitan area will increase by 202,000 over the years 2008-2025, which is an increase of 9.3%. The fraction of non-Western foreign Dutch nationals (in Dutch *allochtonen*: people who are born in a foreign country or who have at least one parent who is born in a foreign country) living in the Amsterdam metropolitan area is almost twice as high as the Dutch average, although there are large differences between the different municipalities. The highest percentage of non-Western foreign Dutch nationals can be found in Amsterdam (34.6%) and Almere (26.1%). In general the share of non-Western foreign Dutch nationals is higher in the large municipalities as compared to smaller ones. The lowest percentages can be found in the small rural municipalities, where the share of non-Western foreign Dutch nationals is generally below 5%.

Figure 1-2: Population by age and gender



Source: Statistics Netherlands Statline (2008b)

Figure 1-3: Net migration rates



Source: O+S Amsterdam (2008a)

1.3.2 Levels of deprivation

The income earned by the inhabitants of the Amsterdam metropolitan region is higher than the Dutch average. The average income for spending was EUR 13,700 in 2005, whereas the Dutch average in the same year was EUR 12,700. There are relatively few households in the Amsterdam metropolitan area which are living on a low income. The share of households in the Amsterdam metropolitan region which belongs to the lowest 10% earners of the Netherlands exceeds the Dutch average only in the municipalities of Haarlem and Amsterdam. Among the large municipalities, Amsterdam has the highest share of households belonging to the lowest 10% earners. This higher level of deprivation is caused by the relatively large fraction of small households in Amsterdam: 51% of all households in 2005 were composed of only one person and 8% were single parent households. A final reason for the relatively high levels of deprivation in Amsterdam is that, as in other large cities, it has neighborhoods with large concentrations of socially and economically disadvantaged people.

1.3.3 Health and wellbeing

The two most important causes of death in the Amsterdam metropolitan area are cardiovascular diseases and neoplasms (such as cancer) They accounted for 29.6% and 29% of all deaths in 2006, respectively. This is slightly lower than the Dutch average. There is, however, a great degree of heterogeneity between different municipalities in the causes of death. In Almere, where relatively few elderly live, 33.1% of deaths were attributable to neoplasms, whereas only 27.1% was caused by cardiovascular diseases. In Amsterdam, however, cardiovascular diseases are the dominant cause of death: they account for 29.4% of all deaths and neoplasms for 27.3%. More than 7 out of 10 inhabitants who are four years or older and live in the Amsterdam metropolitan

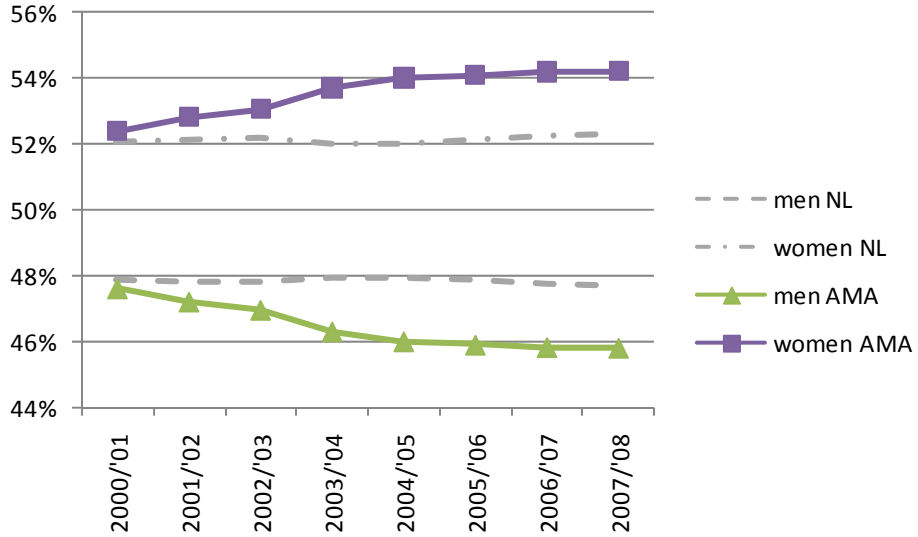
region suffer from one of the following malaise complaints: tiredness, headache, sleeplessness, pain in muscles or joints and back pain. The prevalence of these malaise complaints is particularly high in the region of Amsterdam (74.7%) and Flevoland (75.3%). By comparison, the occurrence is much lower in the more rural regions of Zaanstreek-Waterland (70.2%) and Gooi en Vechtstreek(72.8%). The prevalence rate in the Netherlands as a whole is 71.6%.

An issue closely related to health and wellbeing is sport. Due to the lack of data on the level of the metropolitan region, the following statistics are given for the city of Amsterdam. In 2006, almost two-thirds of the Amsterdam population was playing a sport at least once a month. In 2008, the municipality has developed a policy plan that aims to increase the share of sports players to 70% before 2012. For children, this plan expresses the ambition that at least 80% of the children has to play a sport once a week and 50% twice a week. Children in primary schools are currently the most active in sports: almost 75% of the children of age 6-12 years participate in sports at least once a week. For the age group 13-17 years, this share is reduced to 68%. Adolescents with a Moroccan or Turkish background in the age group 6-18 years are less active in sports than their peers: their participation rates are 61% and 57%, respectively, compared with an average of 72% for the other adolescents. Participation in sports is particularly low amongst Moroccan girls. While more than 7 out of 10 Dutch girls is a member of a sports club, for Moroccan girls this is only 2 out of 10. Participation in sports is also highly correlated to educational level; amongst the higher educated inhabitants of Amsterdam, participation in sports is 3,6 times higher than amongst the lower educated. The municipality of Amsterdam tries to achieve its aims through schools, for instance by appointing more gym teachers and promoting after-school sports activities.

1.3.4 Participation in higher education

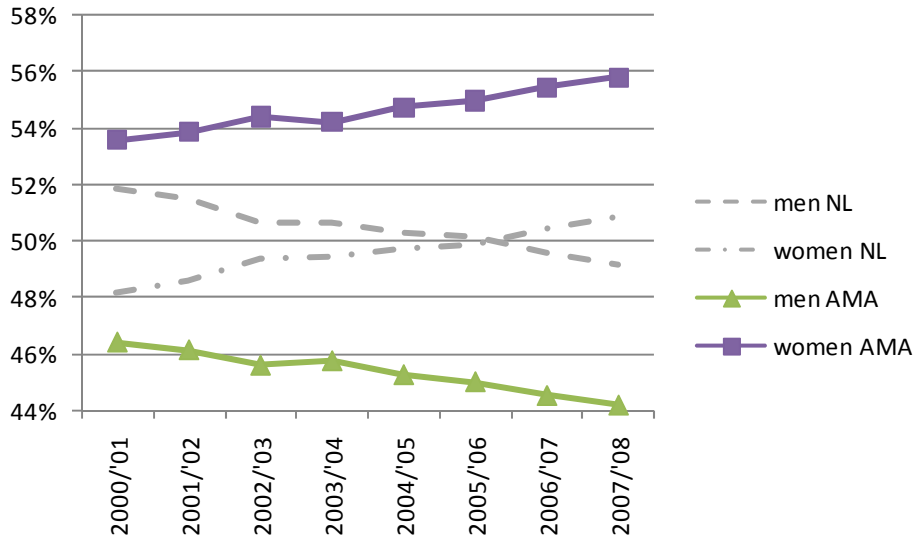
A total of 84,960 students were enrolled at higher educational institutes in the Amsterdam metropolitan area in the academic year 2007-2008. Figure 1-4 shows the share of men and women living in the Amsterdam metropolitan area (AMA) studying at UAS (in the Amsterdam metropolitan area and beyond). There is a pronounced shift visible over time in the representation of men and women at UAS. Even though women were already better represented at UAS than men at the beginning of the century, their share in the student population has even increased. In the academic year 2007-2008, 54.2% of the UAS students from the Amsterdam metropolitan area were female. Whereas the share of women at UAS has remained more or less stable in the whole of the Netherlands, in the Amsterdam metropolitan region we see that female participation in higher education has increased much more strongly than in other parts of the Netherlands. In the Amsterdam metropolitan area, women are thus increasingly outperforming men when it comes to participation at UAS. Figure 1-5 shows the share of men and women living in the Amsterdam metropolitan area (AMA) studying at research universities. The position of women at research universities has improved significantly over the last couple of years as well. In the academic year 2007-2008, the share of women at research universities was 55.8%. The striking difference with the developments we see at UAS is that the percentage of women at research universities was already higher than the Dutch average at the beginning of the century. Over time, the increasing share of women at these universities in the Amsterdam metropolitan area more or less mirrors the development in the whole of the Netherlands. Hence, the gender gap (in this case to the benefit of women) at research universities was not only worsening in the Amsterdam metropolitan area, but in the Netherlands as a whole. By comparison, at UAS the gender gap worsened in the Amsterdam metropolitan region, but it did not in the Netherlands as a whole.

Figure 1-4: UAS students by gender



Source: Statistics Netherlands Statline (2008c)

Figure 1-5: University students by gender

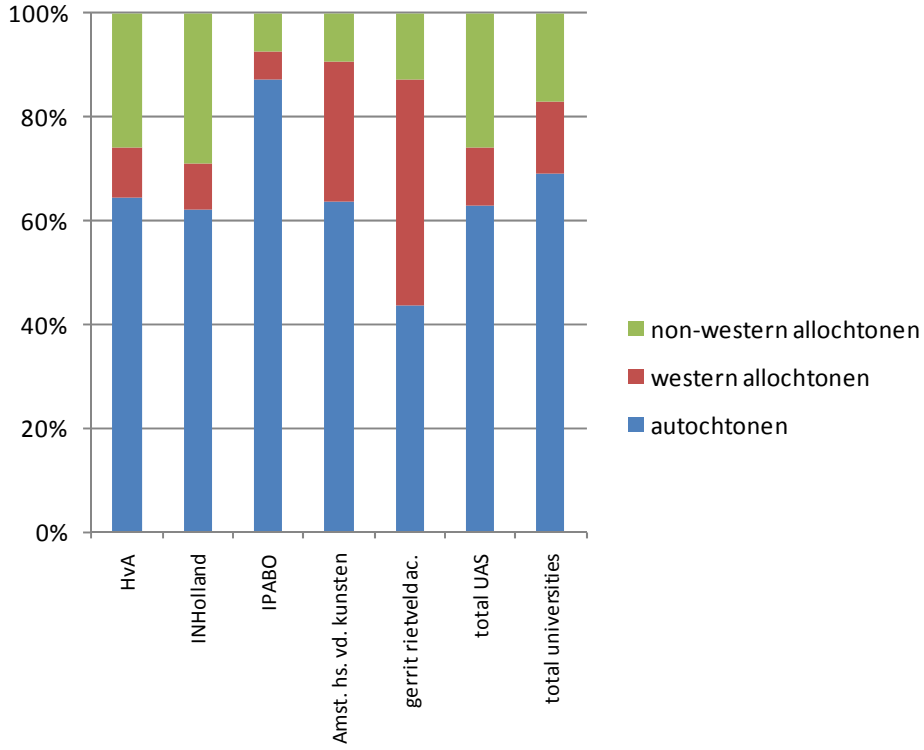


Source: Statistics Netherlands Statline (2008c)

The majority of students studying at higher education institutes (in the Amsterdam metropolitan area and beyond) are Dutch nationals (people who are born in the Netherlands and whose parents are also born in the Netherlands) (Figure 1-6). At the UAS, 63% of the students are Dutch nationals. At research universities this number is even higher: 69%. However, also Western foreign Dutch nationals and non-Western foreign Dutch nationals constitute an important social group at the higher education institutes in the Amsterdam metropolitan region. The share of non-Western foreign Dutch nationals is higher than that of Western foreign Dutch nationals at both UAS and research universities. At UAS, the percentage of non-Western foreign Dutch nationals is 26% and at research universities this is 17%. It is significant that non-Western foreign Dutch

nationals are better represented at the UAS than at research universities. The reverse picture arises when we look at Western foreign Dutch nationals. This group is better represented at research universities (they represent 14% of all students) than at UAS (11%). Among HEIs located in the Amsterdam metropolitan area, the ethnic composition of the student population varies considerably. For the two largest UAS in the metropolitan region – the Hogeschool van Amsterdam and the Hogeschool INHolland – the ethnic composition of the student population is more or less equal with a large share for the *autochtonen*. However, it should be noted that this situation is changing rapidly (see Chapter 4.5.2 for further analysis). The UAS that offer educational programmes in the field arts – the Gerrit Rietveld Academy and the Hogeschool voor de Kunsten – are characterized by a higher share of foreign students as well as foreign Dutch national students (*allochtonen*).

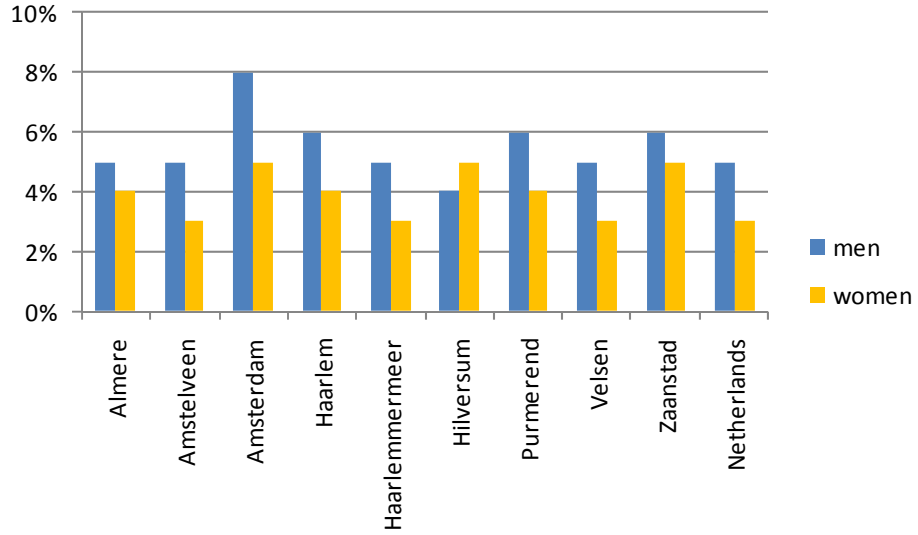
Figure 1-6: Higher education students by social group (2007-2008)



Source: O+S Amsterdam (2008a), HBO-raad (2008a)

One development that worries policymakers in the Amsterdam metropolitan region is the relatively high dropout rate at the secondary education and secondary vocational education levels in some municipalities. Especially in the relatively large municipalities such as Amsterdam, Haarlem, Purmerend and Zaanstad the dropout rates are much higher than the Dutch average. Amsterdam is performing worst with respect to male dropouts from secondary education (VMBO, HAVO and VWO) as well as secondary vocational education (MBO): the male dropout rate there is 8%. This dropout rate is considerably higher than the Dutch average, which is 5%.

Figure 1-7: Dropouts secondary education and MBO



Source: Statistics Netherlands Statline (2006b)

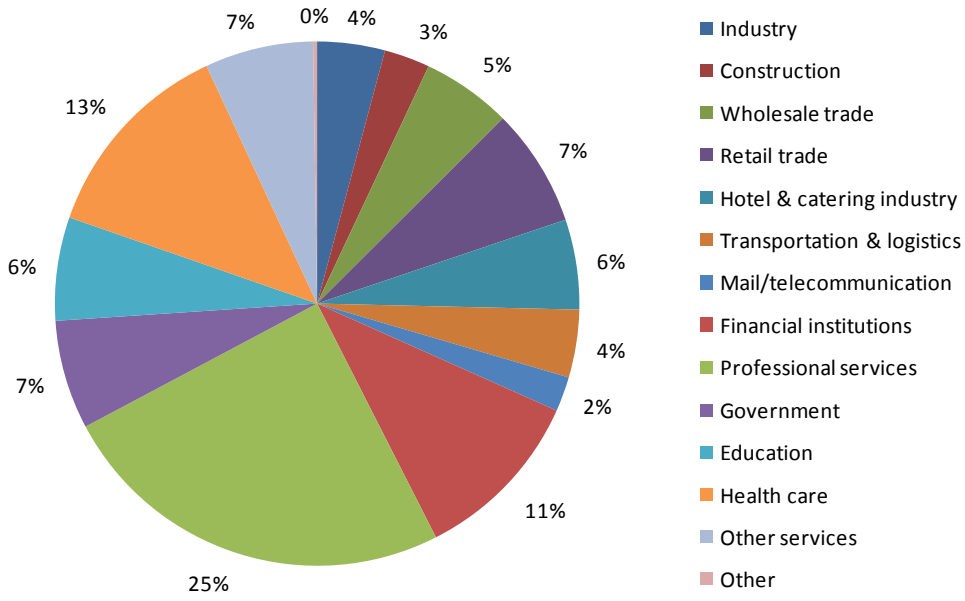
1.4 The economic and social base

1.4.1 Overview

The economic structure of the Amsterdam metropolitan area is largely determined by the city of Amsterdam, which functions as a key hub for international trade. Due to its position along waterways and close to the North Sea, Amsterdam has always been a city highly focused on trade. Until the 19th century the economy of Amsterdam relied on importing and exporting raw materials and food. Because of its strategic position, Amsterdam became a stacking market where products from the North and South were stored, processed and sold. Along with the growth in trade other lines of business developed as well: cartography, printing, and banking and insurance. With the industrial revolution of the 19th century, Amsterdam became an important hub for the transit of raw materials. Amsterdam still heavily relies on its harbor and airport Schiphol as a source of wealth and stimulus for economic growth. In the 1980s and 1990s, it began to focus on city renewing and recovery of the economy. The municipality developed the Zuidas business district. Located between the city and Schiphol, the Zuidas functions as an important business hub. Newly developed offices and businesses such as the Amsteltoren, the World Trade Center and Teleport now dominate the skyline of the Zuidas. Amsterdam also aims to be an attractive city for high-tech companies and new media ventures. Over the last few years, the city developed into a prominent IT-cluster and currently has the highest concentration of IT companies in the Netherlands. As Figure 1-8 shows, the economy of the Amsterdam metropolitan area is nowadays highly oriented towards the tertiary sector. The financial and professional services sector is, according to size, the most important sector for the Amsterdam metropolitan region and in Amsterdam alone, this sector is generating about 150,000 jobs. Within the professional services sector of the metropolitan region, the creative industry is particularly gaining in importance. The number of jobs in the creative industry has been increasing with a yearly average of 4% over the period 1996-07, compared with a yearly average growth of 2.5% in total employment over the same period. In 2007, there were a total of 89,750 jobs in the creative industry in the metropolitan region, with a total value added of EUR 3.4 billion (which is 38% of the total country-wide value added in the creative industry) (O+S Amsterdam, 2008a: 15-22). The city of Amsterdam is

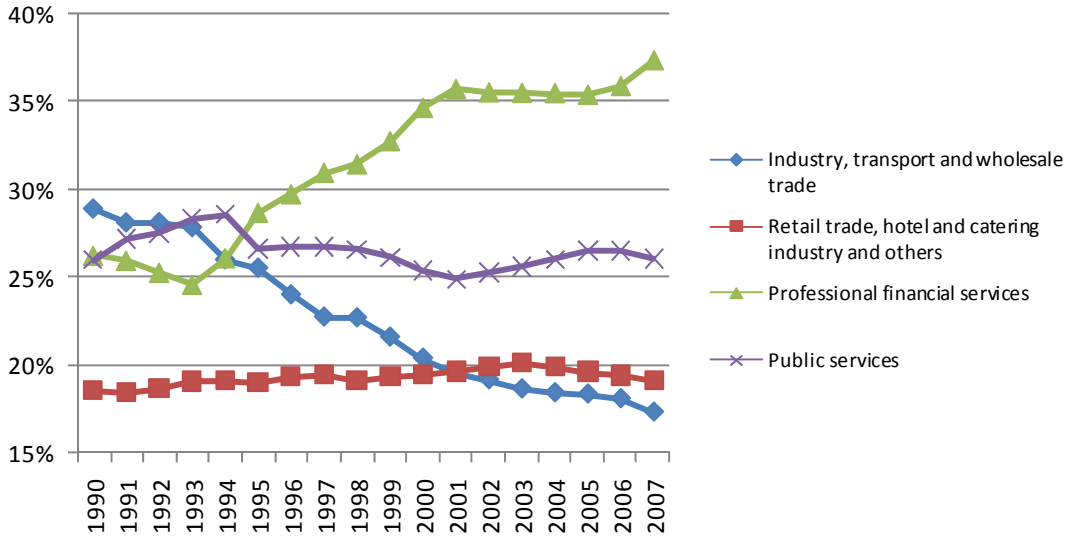
considered the financial capital of the Netherlands given the presence of the Dutch Central Bank, the head offices of ABN AMRO and ING Bank, as well as the head offices of dozens of foreign banks. Compared with other parts of the Netherlands, the tourism sector of the Amsterdam metropolitan area is an important pillar of the regional economy. Over 2007, the metropolitan region attracted 7 million hotel guests (O+S Amsterdam, 2008a). Figure 1-9 shows how the employment by sector in the city of Amsterdam has developed over the past 15 years. The most salient trends are the rise of employment in the professional financial services sector and the decline in employment in the industry, transport and wholesale trade sector. Finally, the ten largest employers in Amsterdam are depicted in Table 1-3. Besides government organizations there is a strong representation of the educational and financial sectors. Both the cities' universities (University of Amsterdam and VU University Amsterdam) as well as two major commercial banks (ING-Group and ABN AMRO) are amongst the ten largest employers in the city.

Figure 1-8: Employment in Amsterdam by sector



Source: Statistics Netherlands Statline (2008)

Figure 1-9: Employment in Amsterdam by sector (1990-2007)



Source: O+S Amsterdam (2008a)

Table 1-3: Ten largest employers in the Amsterdam metropolitan region (1 January 2007)

Rank	Name	No. of branches	No. of jobs	Sector
1	Municipality Amsterdam	187	16,400	Government
2	ING-Group	64	13,500	Financial sector
3	University of Amsterdam (incl. AMC)	90	11,500	Education/health care
4	ABN AMRO	40	10,200	Financial sector
5	VU University Amsterdam (incl. VUmc)	31	9,100	Education/health care
6	Police Amsterdam-Amstelland	32	5,700	Government
7	GVB (independent since 1 January 2007)	8	4,000	Transport
8	UWV	4	3,700	Government
9	Royal TNT Mail B.V.	15	3,100	Mail services
10	IBM/Lotus	5	3,000	Wholesale

Source: O+S Amsterdam (2007b)

Table 1-4 and Table 1-5 give an indication of the balance between small and medium-sized companies. Because the data is not available at the level of the Amsterdam metropolitan area, it is presented for the COROP-regions (Table 1-4) and municipalities (Table 1-5) for which data could be found. According to Table 1-4, the share of medium-sized companies (defined as having 100 or more employees) in the total number of businesses varies between 0.6% and 1% for the various regions of the metropolitan region. The Dutch average is 0.8%. When taking the Groot-Amsterdam region as a point of reference for comparison with the whole of the Netherlands, we can see that the share of very small companies (0-5 employees) and medium-sized companies lies below the Dutch average, whereas the share of companies with 5-100 employees clearly exceeds the national average. Table 1-5 shows how employees are divided over the various company sizes for a number of municipalities within the Amsterdam metropolitan region. Between 63.7% and 71.4% of the employees from the selected municipalities are working for medium-sized

companies, compared to the Dutch average of 64.6%. Except for Hilversum, all selected municipalities from the metropolitan region have a higher percentage of employees working for medium-sized companies than the Dutch average. Particularly in Amsterdam many people are working for the somewhat larger companies.

Table 1-4: Ownership structure companies by number of workers per business

	0-5	5-10	10-100	>100
Agglomeratie Haarlem	81.3%	8.9%	9.0%	0.9%
Zaanstreek	83.9%	8.0%	7.5%	0.6%
Groot-Amsterdam	80.2%	9.1%	10.0%	0.7%
Amsterdam	81.3%	8.7%	9.0%	0.9%
Overig Groot-Amsterdam	82.1%	8.5%	8.5%	0.9%
Het Gooi en Vechtstreek	79.7%	9.3%	9.9%	1.0%
Netherlands	**84.2%**	**7.7%**	**7.2%**	**0.8%**

Source: Statistics Netherlands Statline (2006c)

Table 1-5: Employees by size of business (%)

	1	2-10	10-50	>50
Almere	1.3%	8.8%	19.0%	70.9%
Amstelveen	2.7%	10.7%	18.3%	68.3%
Amsterdam	2.1%	9.5%	17.0%	71.4%
Haarlem	1.8%	10.3%	19.3%	68.6%
Haarlemmermeer	2.0%	11.0%	21.1%	65.9%
Hilversum	2.6%	12.7%	21.0%	63.7%
Purmerend	1.4%	10.4%	20.0%	68.5%
Velsen	1.7%	11.7%	20.7%	65.9%
Zaanstad	1.6%	10.3%	20.1%	68.1%
Netherlands	**1.9%**	**11.5%**	**22.0%**	**64.6%**

Source: Statistics Netherlands Statline (2005a)

1.4.2 Research & development

Table 1-6 shows the R&D expenditures in the province of Noord-Holland (which includes the Amsterdam metropolitan area) and the Netherlands. Data on the level of the metropolitan region were not available, so the province of Noord-Holland is used instead. The data indicate that R&D expenditures in Noord-Holland are below the national average for companies but above the national average for research-institutions. The aggregated R&D expenditures for Noord-Holland add up to approximately 1.38% of the regional domestic product (compared to 1.72% nation-wide). It should be noted that, in the estimation of R&D expenditures of universities in Noord-Holland, the ratio of R&D expenditures to the regional product is calculated for the year 2002, since more recent data are not available. What appears is that the lower fraction of GDP spent on R&D in Noord-Holland is not caused by the government sector and HEIs, but by the business sector. In terms of R&D-investment, HEIs in Noord-Holland are not far behind other institutions in the Netherlands and regional and local governments are even performing better than those in other parts of the Netherlands. Other indicators also give an ambiguous picture of the innovative strength of Noord-Holland in comparison with the Netherlands as a whole. The employment in

high-tech sectors is relatively high in Noord-Holland. The number of patents requested at the European Patent Office (EPO) in Noord-Holland lies substantially below the Dutch average. However, when looking at patent application data from the US Patent Office (USPTO) the number of patent applications per million of working-age is much higher than the Dutch average. This points out that the region specification that is used strongly influence the results.

Table 1-6: R&D expenditures

	R&D expenditures by type of institution (% of regional product)			
	Companies	Government	HEIs	Total
Noord-Holland (2002)	0.85%	0.26%	0.47%	1.58%
Netherlands (2002)	0.98%	0.24%	0. 50%	1.72%

* Data from 2002
Source: Eurostat (2008)

Table 1-7: Other indicators of innovative strength

	Employment in high-tech sector (% of total employees) (2005)	Number of patent applications to the European Patent Office (EPO) (per million of working-age individuals) (2005)	Number of patent applications to the US Patent Office (USPTO) (per million of working-age individuals)
Noord-Holland/ Amsterdam	4.3% (NH)	146.2 (NH)	733.2 (AMS)
Netherlands	4.1%	306.6	132.0

Source: Statistics Netherlands Statline (2005b), OECD (2006), USPTO (2009)

1.4.3 Social and cultural characteristics of the region

1.4.3.1 Social developments

From the 1970s onwards significant immigration to Amsterdam takes place from Suriname and Southern countries such as Turkey and Morocco. The result is that Amsterdam is now amongst the most culturally diverse cities of the world: 37% of the inhabitants belong to an ethnic minority group. The 'urban melting pot' which Amsterdam is becoming has its positive as well as negative sides. On the negative side, the labor market position of foreign migrants appeared to be very weak with high unemployment rates (even among the second generation), which led to increasing socio-economic and ethnic tensions in the city (Nijkamp, 2009: 1). On the positive side, Amsterdam witnesses a profound transformation based on creative cultures. This new orientation does not only provide a new dynamism for the city, it also has a symbolic value by showing the historical strength of these places as foundation stones for a new and open future (ibid: 2). Migrant entrepreneurs also form a significant part of the SME sector in Amsterdam and may hence be important vehicles for urban vitality (ibid: 6). Nowadays Amsterdam is swiftly transforming into a services oriented economy. Despite the current worldwide economic downturn, it has favorable growth prospects.

1.4.3.2 Regional identity

The extent to which people in the Amsterdam metropolitan area are linked by a common identity is very reminiscent of the way identity is experienced on the level of the Randstad. That is, there does not seem to be a common identity linking the people living in the Amsterdam metropolitan area. Instead, the regional identity is more closely linked to the city in which people live such as Amsterdam, Haarlem or Zaanstad (OECD, 2007a: 38). This lack of a strong identity beyond the city-region goes back to the 16th century when the foundations for the Dutch nation-state were laid, not so much out of a common identity, but out of common interests of otherwise competing cities (ibid: 38; Schama, 1987). This historical co-operative competition between cities could explain why common identity has been linked to the city and – to a lesser extent – nation, but not so much to the region. Since the Amsterdam metropolitan area is centered around Amsterdam, it is not surprising that much of the regional identity is shaped by the city more than anything else.

Unlike the Randstad or the Amsterdam metropolitan area, the *city* of Amsterdam has a distinct and firmly rooted identity. Amsterdam became the world's richest and most powerful city in the early 17th century, which is referred to as the 'Golden Age'. A combination of Protestant work ethic, which encouraged saving and investment and entrepreneurial spirit brought Amsterdam a period of unprecedented wealth. This religion-based culture found its most succinct expression in Calvinism, which inspires sobriety and simple living, and is still often used to describe one of the foundations of Dutch culture (Nijman, 1999: 151). Besides Calvinism, commercialism and frugality, 'tolerance' is another central ingredient of Amsterdam's historically grown culture. In its original meaning, this referred to the tolerance of diversity in the form of religious beliefs and national backgrounds (ibid: 153). In the final years of the 16th century, up to half of the city's population was foreign or of foreign extraction. Finally, another element of Amsterdam's urban culture that is often observed is 'egalitarianism'. This cultural trait, however, dates from the 1960s and 1970s when the Netherlands became a notable example of West European social democracy, with progressive laws on taxation, education, public housing, etc. While this also applies to the Netherlands at large, egalitarianism found a unique expression in Amsterdam through several anti-establishment movements (ibid: 154). In the late 1960s, Amsterdam was by far the most important place for student demonstrations, political upheavals, the sexual revolution, grass root activity, etc. During the 1960s, 1970s and 1980s, urban social movements such as the 'Provos', the 'Kabouters' and the squatters have played an important part in the changing image of the city, particularly inside the Netherlands.

Nowadays, the culture and regional identity of Amsterdam are largely the remnants of the 'Golden Age' in which it became a thriving city. On a national scale, it is the undisputed cultural center of the country, excelling with orchestras, ballet, stages, museums and galleries. Institutions such as the Royal Concertgebouw Orchestra and Rietveld Academy (arts) can be counted among the world leaders in their respective disciplines. Monuments and museums, which show the work of great Dutch painters such as Rembrandt and Van Gogh, draw large numbers of visitors each year. On an international scale, the aspect of Amsterdam's urban culture and identity that receives by far the most attention is 'tolerance' (ibid: 155). One of the effects of cultural globalization for Amsterdam has been the commodification of its identity as a tolerant place (ibid: 155). Amsterdam is first and foremost considered to be the city of freedom and liberal drugs policy. The Red Light District and coffee shops are popular among tourists. It is also considered by many to be the Gay Capital of Europe.

1.4.4 Labor market indicators

Table 1-8 compares the Amsterdam metropolitan region with the Netherlands as a whole on some key labor market indicators. Compared to the Dutch average, the population of the Amsterdam metropolitan area is characterized by a higher share of working-age individuals. The unemployment rate, however, is also higher in the Amsterdam metropolitan area. The metropolitan area nevertheless has a higher net participation rate, defined as the percentage of working-age individuals (15-65 years) that are actually employed. The population in the Amsterdam metropolitan region is clearly relatively higher educated: 38% of individuals aged 15-65 have earned a degree at either a UAS or a research university compared to 31.1% in the Netherlands as a whole. When looking at secondary education, the share of students who study at the HAVO level (graduation at this level grants entry to a UAS) is below the Dutch average. The share of students who study at the VWO level (graduation at this level grants entry to both UAS and research universities, but should essentially be seen as pre-university education) is clearly above the Dutch average. The Amsterdam metropolitan area thus performs better than the Netherlands as a whole when it comes to student enrollment for pre-university education. The dropout rate at secondary educational levels (VMBO, HAVO and VWO) as well as secondary vocational education (MBO) are substantially higher in some municipalities in the Amsterdam metropolitan region. In Amsterdam, for example, the dropout rate is 8%, which is considerably above the national average.

Table 1-8: Key labor market indicators

	Amsterdam metropolitan area	Netherlands
Between 15 and 65 years (2008)	68.9%	67.4%
Unemployment (% of working-age) (2008)	4.5%	4.1%
Net participation rate working-age (2006)	65.9%	64.5%
% of persons between age 15 and 65 with higher education (2006)	38%	31.1%
% secondary education students at HAVO level (2007-2008)	20.0%	21.7%
% secondary education students at VWO level (2007-2008)	29.8%	26.7%
Dropout rate from secondary educational and secondary vocational schools (2006)	8%*	5%

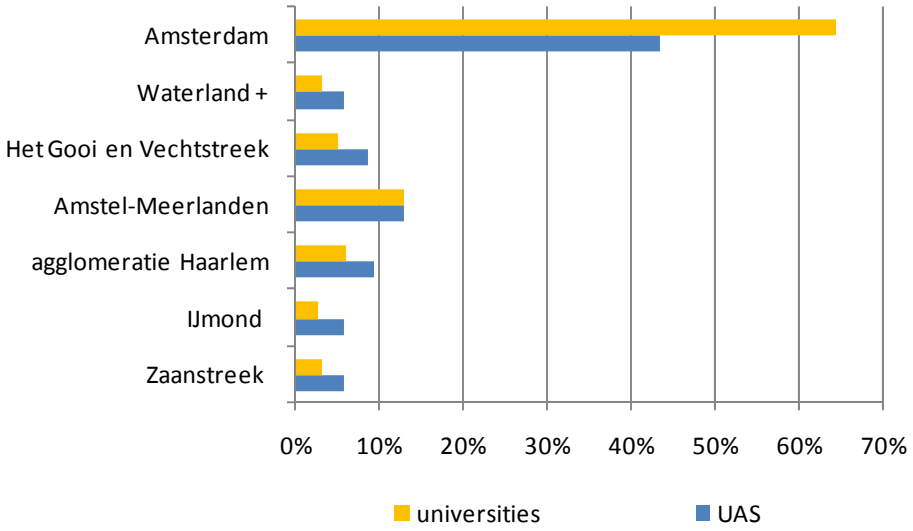
* Numbers are for the municipality of Amsterdam only

Source: O+S Amsterdam (2007), O+S Amsterdam (2008a), Statistics Netherlands Statline (2006b)

Because the two research universities and most UAS are located in Amsterdam, it is not surprising to find that the largest share of students from the Amsterdam metropolitan region is also living there (Figure 1-10). A more interesting observation is that more than half (57%) of all UAS students is living outside Amsterdam. This is partly explained by the availability of UAS in

the municipalities of Amstelveen, Almere, Haarlem and Diemen. However, also in Waterland, IJmond and the Zaanstreek regions, a higher percentage of students at UAS can be found. A possible explanation is that students at the UAS are living with their parents more often than students at research universities.

Figure 1-10: Higher education students by place of living



Source: O+S Amsterdam (2008a)

Table 1-9 presents the unemployment rate for the Groot-Amsterdam region (data on the level of the Amsterdam metropolitan region were not available) and the Netherlands. The Groot-Amsterdam region performed better than the national average on a number of key economic indicators over the last decade. Unemployment has declined sharply in the Groot-Amsterdam region (as in the rest of the Netherlands) due to labor market and social welfare reforms. Nevertheless, unemployment has been structurally higher in the Groot-Amsterdam region as compared to the Dutch average. Only in 2004 the unemployment rate was more or less the same as the national average.

Table 1-9: Unemployment (% of population aged 15-64)

	1996	2000	2004	2008
Groot-Amsterdam	8.7%	5.2%	6.4%	4.0%
Nederland	7.5%	3.8%	6.5%	3.9%

Source: Statistics Netherlands Statline (2008d)

1.5 The governance structure

1.5.1 Governance in the Netherlands

The Netherlands is a unitary state with three tiers of government: central, provincial and municipal with direct elections taking place for all three tiers. There are currently 12 provinces and 443 municipalities (figure for 2008, see CBS Statline).

The central government is responsible for macro-economic and social-distributional policies. It also collects the bulk of taxes (taxes on income, profits and capital gains, taxes on property, taxes on goods and services, etc.) and subsequently allocates large amounts of tax revenues to lower-level governments via targeted funds (called *Gemeentefonds* for the city communities and *Provinciefonds* for the provinces).

Provinces are responsible for the coordination of a number of public policies, such as planning, transport, culture and social affairs. They also have legal control over the municipalities (notably in the domain of planning where they approve the municipal land use plan) and over water boards, and they maintain some operating responsibilities for a few policy sectors like the management of the road system. In addition, the provinces correspond with the territorial level of deconcentration of some ministries such as those for administering public works, water management and agriculture (OECD, 2007: 159).

Municipalities are responsible for a wide range of policy sectors like roads, public transport, housing, local planning, environment, social affairs, economic development, education, health care, etc. The municipalities share many of their responsibilities with the central government, but they are relatively independent. The central government establishes the general framework, rules and norms that local authorities must follow, monitors most policies' implementation and controls the funding for most policy sectors (OECD, 2007: 159-60). Despite their broad responsibilities, Dutch municipalities have limited opportunities to impose local taxes. A relatively small proportion of municipal revenues are raised by local taxes. In 2006, about 5% of total tax revenues were levied at the local level. After part of the municipal property tax was abolished in 2006, however, the proportion of taxes levied at the local level has currently declined below 1% (OECD, 2007).
Like most municipalities in the Netherlands, Amsterdam is run by a city council, governed by a mayor, aldermen, and the municipal council. However, unlike most other Dutch municipalities, Amsterdam is subdivided into fifteen boroughs (*stadsdelen*), a system that was implemented in the 1980s to improve local governance. The boroughs are responsible for many activities that had previously been run by the central city. Fourteen of these have their own council, chosen by a popular election. The fifteenth, Westpoort, covers the harbor of Amsterdam and therefore has very few residents. For this reason, Westpoort is governed by the central municipal council. Local decisions are made at borough level, and only affairs pertaining to the whole city, such as major infrastructure projects, are handled by the central city council.

With respect to regional economic policy, the central government's policy is aimed at enabling each region to provide the same level of public goods and services. This takes place via general and specific grants that are allocated to both provincial and (principally) to municipal governments. They are calculated according to criteria that try to take factors into account to compensate for regional cost differences and differences in revenue raising capacity. Central standards and limited local fiscal autonomy ensure that regional differences remain small. Policies promoting regional development are limited (OECD, 2007a: 121-2). With the publication of the 2004 report *Pieken in de Delta* by the Ministry of Economic Affairs, regional economic policy in the Netherlands has shifted towards a focus on strengthening economic key regions, such as the North and South Wings of the *Randstad*. The goal is to exploit region-specific opportunities of national significance and to make use of the regional potential to create an internationally competitive investment climate. In the North Wing of the Randstad, which incorporates the Amsterdam metropolitan area, a number of sectors have been selected that are supported: creative industry, innovative logistics, trade, tourism, and life sciences and the medical cluster. Within these clusters projects were selected in 2006. Over the period 2007-2010 they will receive EUR 271 million from the Ministry of Economic Affairs (OECD, 2007a: 123).

The Ministry of Education, Culture, and Science (OCW) coordinates higher education policy. Over the past 20 years, the policy objective of the central government has been to decrease its steering and regulatory role and to increase institutional autonomy. The Ministry of OCW retains control over the public budget for new educational programs by means of the macro efficiency test and of course determines the rules for the allocation of the public budget for higher education in general. But the overall policy is that educational institutions at all levels enjoy a great degree of autonomy. Following this, the Ministry of OCW has shifted many policymaking responsibilities to local governments and school boards. Municipalities are responsible for the provision of primary and secondary education. In Amsterdam, there is a division of responsibilities between the central city government and the governments of the boroughs. The central city government is responsible for secondary education provision and takes a leading role in particular areas such as the shortage of teachers and policies aimed at tackling the problem of drop outs. The central city government also takes the responsibility for the provision of vocational education. The boroughs bear responsibility for the provision of primary education. UAS and research universities are under direct supervision of the central government. The higher educational institutions budgets are largely financed with funds received directly from the Ministry of OCW. For this reason, local and regional governments have little influence over the provision of tertiary education.

Municipalities in the Netherlands usually invest large amounts of funds in land and property. They subsequently designate the land they own to be used for a particular purpose, which can for instance be real estate or business development. In Amsterdam, for example, more than half of all houses in the city is the property of non-profit housing corporations, while the land is owned by the municipality (OECD, 2007a: 115-6). The municipality of Amsterdam invests substantial shares of its assets in land and business property. In absolute numbers, the municipality owned land worth EUR 4.9 billion and business property worth almost EUR 1 billion in 2006. In relative numbers, this was 37.9% and 7.6% of the total assets in 2006, respectively. In their competition for businesses, local governments often provide financial inducements in an attempt to attract more entrepreneurs. In Amsterdam, for example, the municipality runs a microcredit programme that provides relatively small loans to businesses that do not have access to the mainstream credit market. Another initiative is that the municipality disburses subsidies to entrepreneurs in particular designated neighborhoods who invest in the improvement of their business.

1.5.2 Governance in the Amsterdam metropolitan region

The Amsterdam metropolitan area is the name given to the collaboration of regional and local authorities in the Northern part of the *Randstad*. It is important to note that the Amsterdam metropolitan region has no unitary governance structure within the Dutch three-tier governance system. Decision making in the metropolitan region is not very different from that on the *Randstad* governance level. Decisions are made in soft governance arrangements. These arrangements are bottom-up initiatives coming from municipalities, often with partners from the private sector. These partnerships do not have decision-making powers and seek the implementation of their proposals by making recommendations. This implies that the Amsterdam metropolitan area is rather a voluntary collaborative initiative at a unique level of governance. The regional partners agree on issues such as the regional economy, construction, employment, infrastructure and land development policy. By making agreements in these areas, the parties join forces in order to make the Amsterdam metropolitan area an internationally competitive region. The governance of the Amsterdam metropolitan region lies with the Amsterdam metropolitan region Central Administration. The Administrative control of the Amsterdam metropolitan region lies with the Coordination Committee. The Amsterdam metropolitan area Central Administration is responsible for the preparation of Metropolitan conferences and ensures that agreements are

implemented. There is also an administrative platform dealing with mobility, the *Noordvleugel* (North Wing) Accessibility Platform, and one dealing with economics: the Regional Economic Stimulation Platform (*Platform Regionale Economische Stimulering, PRES*).

1.5.2.1 Coordination Committee

The Coordination Committee serves as an informal agreement platform within the Amsterdam metropolitan area for mayors, aldermen and provincial administrators from the participating local authorities and provinces on the region's current affairs. The current mayor of Amsterdam, Job Cohen, and the Queen's Commissioner of the province of Noord-Holland, Harry Borghouts, both have a presidential role in this informal body. Committee members are invited personally by the presidents. This was done based on geographical and political dispersion and an even distribution of elected and non-elected administrators. The committee meets three times a year. The committee is not a decision-making body and implementation is the responsibility of the parties involved. However, the composition of this body does enable plans to be put into action, where necessary.

1.5.2.2 Amsterdam metropolitan region Central Administration

The administrative control of the Amsterdam metropolitan area lies with the Amsterdam metropolitan region Central Administration. The Amsterdam metropolitan area Central Administration also ensures that all agreements made at the Metropolitan conferences (previously Noordvleugel conferences) are implemented. Aldermen from the following authorities have a seat on the Amsterdam metropolitan region Central Administration: the local authorities of Almere, Amstelveen, Amsterdam, Haarlemmermeer, Haarlem, Hilversum, Purmerend, Velsen and Zaanstad, the provinces of Noord-Holland and Flevoland and the chair of the Chamber of Commerce. The administrative chair is the Amsterdam alderman for spatial development and the spatial development delegate for Noord-Holland acts as vice-chairman.

1.5.2.3 Accessibility Platform

The Noordvleugel Accessibility Platform is an informal administrative collaboration between the provinces of Noord-Holland and Flevoland, the Amsterdam metropolitan region, the Amsterdam and Almere local authorities and North Holland Public Works and Water Management. The aim of this platform is to create regional agreement and commitment on major infrastructure projects as well as development strategies for traffic and transport across the whole Amsterdam metropolitan area. By protecting and promoting (international) accessibility to the region, the Noordvleugel Accessibility Platform is one of several parties helping to realize the ambition to give the metropolitan region a stronger position internationally. The Platform meets on average six times a year. The chairman is Leen Verbeek, Portfolio Manager of Public Transport for the Amsterdam metropolitan region and mayor of Purmerend.

1.5.2.4 Regional Platform for Economic Stimulation

The Regional Platform for Economic Stimulation is the administrative consultation on the economic development of the Amsterdam metropolitan region. Its members include aldermen for economics from the local authorities of Almere, Amsterdam, Haarlem, Haarlemmermeer, Hilversum and Zaanstad, the provinces of Flevoland and Noord- Holland, the Amsterdam Municipal Region and the Chamber of Commerce for Amsterdam and the surrounding area. Globalization and European integration lead to vigorous changes in economic structure. The platform administrators work together to find solutions to the economic challenges which the region is facing as a result of these international developments. The Regional Platform for

Economic Stimulation focuses on the following in succession: efficient organization of the region's economic issues, fulfillment of the metropolitan strategy’s economic dimension, and design for reconciling economic issues with government partners. The creation of a social-economic agenda for the metropolitan area is the main priority at the moment. The aim is to present an action plan at the end of the year with metropolis-wide activities to strengthen the whole of the metropolitan area’s economy.

2 CHARACTERISTICS OF THE HIGHER EDUCATION SYSTEM

2.1 Introduction

In this chapter we discuss the higher education system of the Netherlands. Key issues that will be discussed are:

- The overall size of the higher education system and how this has changed over the past decade;
- The governance and regulatory framework for the higher education system;
- Financing tertiary education in the Netherlands;
- The demand for and supply of different types of higher education product;
- The regional dimension 'inside' the national higher education policy.

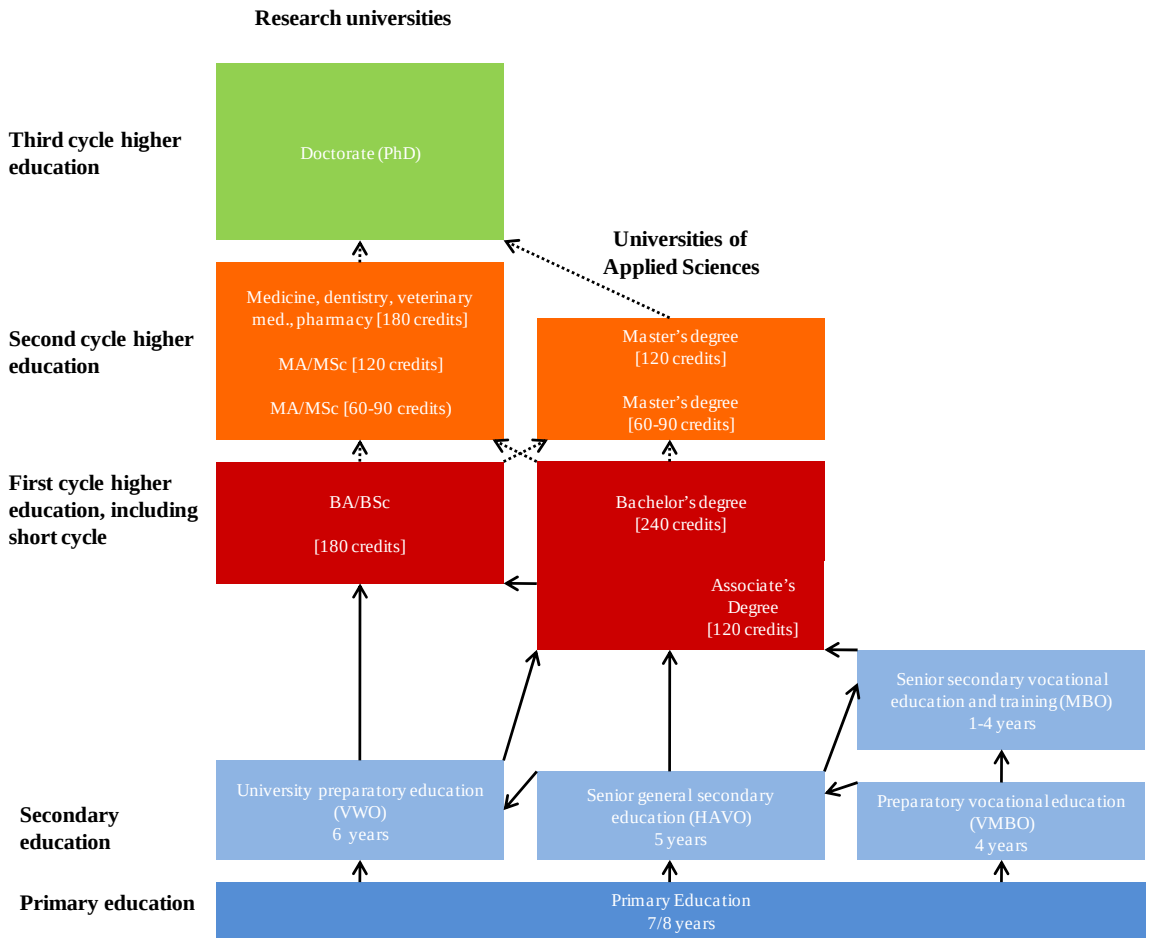
Section 2.2 presents an overview of the Dutch system of higher education. It discusses the structure of the national higher education system, its overall size and the international ranking of Dutch HEIs. Section 2.3 analyzes the relation between higher education and labor market. Section 2.4 focuses on governance of and regulatory framework for the higher education system. Section 2.5 explains how the Dutch higher education institutes are funded. Finally, section 2.6 discusses the regional dimension 'inside' the national higher education policy.

2.2 Overview of the national system of higher education

The Netherlands has a binary system of higher education, which means there are two types of programmes: research oriented education (*wetenschappelijk onderwijs*, WO), traditionally offered by research universities, and professional higher education, (*hoger beroepsonderwijs*, HBO), traditionally offered by hogescholen, or universities of applied science (UAS). These programmes differ not only in focus, but in access requirements, length and degree nomenclature as well (Jonge and Berger, 2006: 11).

The higher education system in the Netherlands is based on a three-cycle degree system, consisting of the Bachelor, Master and PhD degrees (Figure 2-1). The three-cycle system was officially introduced in the Netherlands at the beginning of the academic year of 2002-2003, in compliance with the Bologna process (see Box 2-1). The Bachelor-Master structure replaces the traditional Dutch educational system that awarded diplomas of *doctorandus* (*drs.*), *ingenieur* (*ir.*) or *meester* (*mr.*) after graduation from a four or five year during educational programme. Bachelor and Master programmes are available at both universities and UAS (although UAS focus on the Bachelor programmes) at publicly funded and privately funded institutions alike. Students who pass the final examination of a UAS or research university, may use, in certain cases, certain titles. Graduates of Bachelor programmes at recognized UAS may use the title "Bachelor" (abbreviated to B and placed after the holder's name), followed by the subject or professional field (such as Bachelor of Education), but not the words "of Science" or "of Arts" (MinOCW, 2007a: 79). Graduates of Master programmes may use the title "Master", followed by the subject or professional field (such as Master of Education), but not the words "of Science" or "of Arts" (ibid: 79). Graduates of 3-year courses at recognized universities may use the title Bachelor of Arts or Bachelor of Science, depending on the subject studied (ibid: 80). Holders of university master's degrees may use the title "Master of Arts" or "Master of Science", depending on the subject studied (ibid: 80). Finally, PhD degrees can be awarded only by universities and the Institute of Social Studies in the Hague (Jonge and Berger, 2006: 12).

Figure 2-1: Structure of the higher education system in the Netherlands



* A solid arrow indicates a right to access, a dotted arrow indicates that some form of selection or bridging requirement may be applied
Source: Nuffic (2008)

Box 2-1: Bologna Declaration

In 1999, the European Union ministers of education signed the Bologna Declaration. The Bologna Process was set up with a view to harmonizing national education systems in the Member States and creating a single European Higher Education Area (EHEA) by 2010. The basic Bologna objective is that higher education in all the countries should consist of two cycles of study: undergraduate (Bachelor) and postgraduate (Master). Other objectives of the declaration are the adoption of a system of easily readable and comparable degrees, establishment of a system of credits, promoting student and teacher mobility, promotion of European cooperation in quality assurance, and the promotion of several other European dimensions in higher education (regards to curricular development, inter-institutional co-operation, mobility schemes and integrated programmes of study, training and research). In the Netherlands, the Bologna Process has led to the introduction of the Bachelor-Master system, the accreditation system (see § 2.2.3) and the European Credit Transfer System (ECTS).

Source: MinOCW (2007a: 68), EU (1999)

HBO master's degrees are a relatively new phenomenon. Until recently, UAS did not receive government funding for their master programmes. As a result of this these programmes were, with tuition fees varying from EUR 5,000 to EUR 15,000, much more expensive than the master's programmes offered by research universities (MinOCW, 2007a: 73). In 2007, however, the Ministry of Education, Culture and Science formulated a new strategic agenda for higher education, research and science policy, *Het Hoogste Goed*, where EUR 5 million (increasing up to EUR 20 from 2011) of public funds are made available to finance master's degrees offered by UAS (MinOCW, 2007b: 12). At the end of 2007 there were about 130 accredited master's programmes at HBO institutions (MinOCW, 2007a: 75-76).

Access to the system of tertiary education is obtained by qualifying from one of the following types of schools:

- MBO level 4 ('intermediate level vocational education', gives access to UAS);
- HAVO (five-year higher level of secondary education, gives access to UAS);
- VWO (six-year highest level secondary education, gives access to UAS and universities);
- Successfully completing a first-year examination at a UAS allows access to a university program in the same area of expertise (ibid: 11).

2.2.1 Universities

Research universities combine academic research and teaching. University education focuses on training in academic disciplines, the independent pursuit of scholarship and the application of scholarly knowledge in the context of a profession and aims to improve understanding of the phenomena studied in the various disciplines and generate new knowledge (MinOCW, 2007a: 68). The university sector consists of 14 government-funded research universities (including the Open University), eight academic medical centers and several publicly funded research institutes affiliated with the universities. Two of the universities, i.e. University of Amsterdam and the VU University Amsterdam, are based in Amsterdam. Furthermore, two of the nation's academic medical centers are based in Amsterdam: the AMC (Academic Medical Center, affiliated with the University of Amsterdam) and the VUmc (the VU University's medical center). In addition to the 14 government-funded universities, there is a number of recognized universities which are not funded by the Ministry of Education, Culture and Science. However, the terms of the Higher Education and Research Act do apply to these universities and the Bachelor's and Master's degrees awarded by these institutions are recognized by law. These recognized universities consist of six universities that are offering theological courses, one offering a degree course in humanism, and Nyenrode Business University (ibid: 72).

2.2.2 Universities of Applied Sciences

UAS provide theoretical and practical training for occupations for which a higher vocational qualification is either required or useful. Graduates find employment in various fields, including middle and high-ranking jobs in trade and industry, social services, health care and the public sector (ibid: 76). There are currently 41 UAS which receive government funding (HBO-raad, 2009a). They consist of general institutions as well as institutions specializing in a specific field, such as agriculture, fine and performing arts, or teacher training. Compared to universities, UAS offer more practically oriented programmes. Also with respect to research activities, the UAS have a different function than research universities. Whereas the universities contribute both to the development of scientific knowledge and to the utilization of this knowledge in society,

research activities at UAS should contribute to the maintenance and development of the professional practice in society (Weert and Boezerooy, 2007: 31).

The issue of applied research at UAS can be considered one of the bottlenecks of the Dutch higher education system, as the proportion of innovative enterprises that co-operate with higher education institutions and with research institutes is relatively low in the Netherlands as compared with other EU15 countries (OECD, 2008a: 70). Moreover, UAS are not eligible for basic government research funding (Weert and Boezerooy, 2007: 31). Instead several regulations have been established, such as the RAAK-regulation which offers financial support to initiate research projects in the field of development and knowledge (see § 2.6). In order to stimulate HBOs to conduct more practice-based research and improve innovative strength of these institutes, *lectoraten* were introduced. There are currently almost 400 lectors working at UAS (HBO-raad, 2008b). The job specification of a lector is to transfer knowledge to industry (SMEs) and society in general and to develop applications of knowledge on demand. They are knowledge experts in their field and are specialists in the application of knowledge in professional contexts within companies and organizations (Jonge and Berger, 2006: 12-13). Initially the *lectoraten* were partly financed from subsidies made available by the Foundation Knowledge Development (SKO), which means that they were indirectly paid for by the government (SKO, 2008: 18). The remainder was paid for by the UAS themselves. Recently the system has changed in the sense that *lectoraten* are fully paid for from the first stream lump sum funds that UAS receive from the Ministry of Education, Culture and Science.

Because the *lectoraten* are now financed with regular funds, SKO is no longer involved in the evaluation of UAS applications for new lectors. This implies that UASs have come to enjoy a high degree of autonomy in using government funds for the creation of *lectoraten*. They are free to choose the knowledge fields in which lectors should be active and enjoy considerable autonomy in determining the job description of a lector. Broadly speaking a lector has four tasks: knowledge development, professionalization of lecturers at their UAS, renewing education curricula and knowledge circulation from and to society (SKO, 2008: 15). Each lector is expected to form a *kenniskring* ('knowledge circle') consisting of UAS lecturers and professionals from the private sector. This is to ensure that their research and expertise reaches students and has enough practical relevance. Besides this lectors are expected to give lectures and supervise PhD students. There are no standardized measures of quality which are used to review the performance of lectors. SKO has evaluated lectors based upon professional standards developed by lectors themselves in collegial meetings. In its final evaluation report on *lectoraten* SKO has recommended the development of professional standards in relation to the quality of research (ibid: 21). The career opportunities of lectors are limited in practice because 'seniority' is an important condition for the fulfillment of *lectoraten*. About 60% of all lectors are 50 years or older. In addition, the average term for a *lectoraat* is 4-5 years although re-appointment is possible. The far majority of lectors are holding another position outside the UAS at which they are appointed. 40% of the lectors with a second job are working at a university, whereas another 45% work at a profit or non-profit institution (ibid: 12).

2.2.3 Accreditation

For fifteen years until 2002, the quality assurance process for higher education in the Netherlands was a system of peer review (OECD, 2008a: 83). Many, however, felt this system of accreditation was not sufficiently independent or objective. Moreover, possible interventions by the government were limited to publicly funded institutions. As the Netherlands introduced the Bachelor and Masters degrees, there was a change in the quality assurance process, with a movement towards external accreditation of programmes to reflect the wider international context

(ibid: 83). In part, this new system of national accreditation was implemented in response to the 1999 Bologna declaration which identified certain expectations of higher education in Europe, including quality assurances processes.

The Netherlands-Flanders Accreditation Organization (NVAO) was established by law as the accrediting body, with responsibility for the accreditation of all Bachelors and Masters programmes from publicly funded institutions, and private institutions wishing to offer degree programmes (ibid: 83). This implies that private higher education institutions will be included in the accreditation procedures on an equal footing with public ones, apart from the issue of public funding (Weert and Boezeroy, 2007: 71). This will open up the Dutch higher education system for globalization forces. The NVAO evaluates each Bachelors and Masters programme for accreditations on a 6-year cycle (MinOCW, 2007a: 76). The criteria used to evaluate these programmes are aims and objectives, content of the programme, deployment of staff, facilities and provisions (OECD, 2008a: 84).

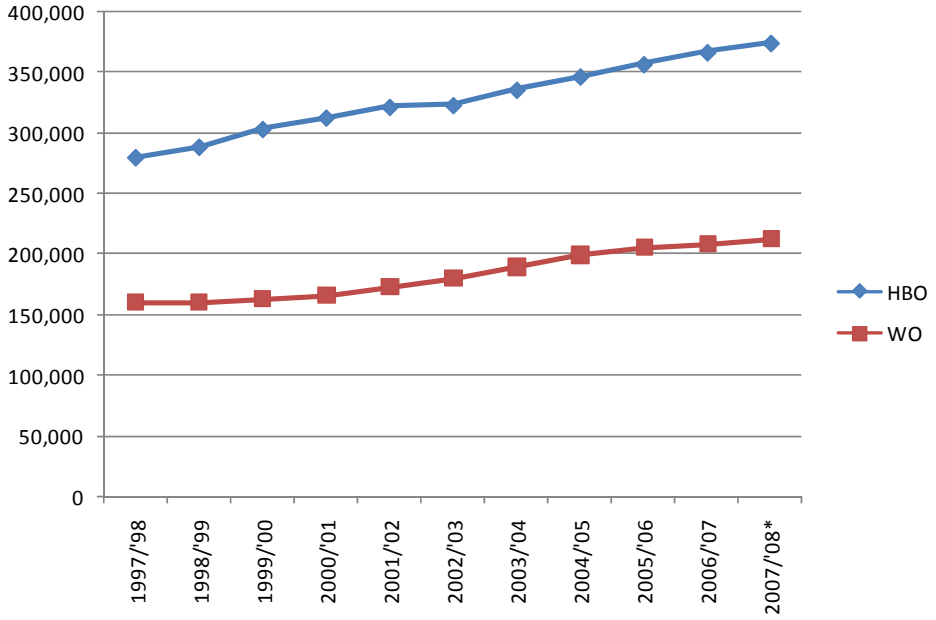
The Ministry of Education, Culture and Science has set the ambition to make the accreditation of higher education programmes at HBO institutions and universities simpler and more efficient. In order to achieve this, OCW wants to broaden and virtually halve the number of Bachelor programmes at universities. University Master degree programmes and UAS courses will also be restructured and reduced in number. New programmes of study will not be accredited until the Ministry of Education, Culture and Science has first established that there is a social demand for them (MinOCW, 2007a: 121). In the short term, the Ministry of Education, Culture and Science aims to reduce the administrative burden by obliging the NVAO to focus more on the educational content of study programmes and less on the process involved.

2.2.4 Overall size of the higher education system

The *total number* of students in higher education rose from just over 438,000 in 1997-98 to around 585,000 in 2007-08 (Figure 2-2). This is an increase of more than 33% over a 10-year period. However, this growth was biased in favor of UAS. For a large part, this can be explained by an increasing gap in graduates from secondary educational schools between the HAVO level (which mainly prepares for studies at a UAS) and VWO (which predominantly prepares for studies at a research university) (Statistics Netherlands Statline, 2009a). The inflow of new students to UAS shows a strong growth over the period 1997-98 to 1999-00, followed by a three-year period of decline and subsequently growth from 2002-03 onwards. The inflow of students to research universities shows a steady growth over the entire period from 1997-98 to 2007-08. In relative terms, *the inflow of students* to UAS increased by 27% over the past ten years, whereas the inflow of students to research universities increased by almost 50%. It therefore seems that research universities are catching up with UAS in terms of total student enrolment over the next couple of years.

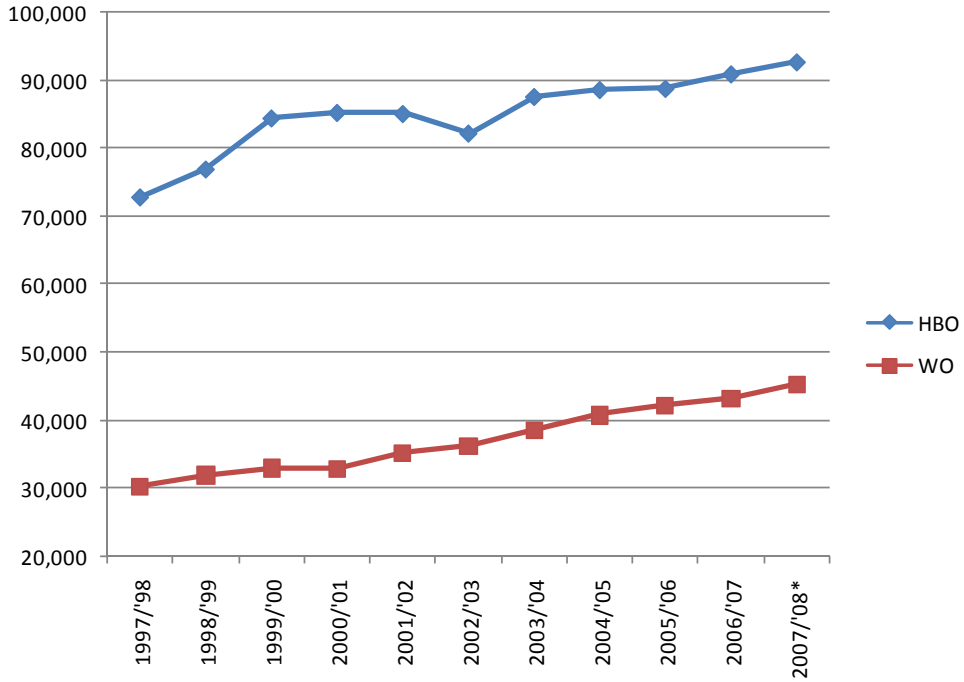
However, in accepting new students universities are also increasingly confronted with a financial constraint since the public educational budget for universities has remained more or less stable over the past decade whereas student numbers have increased strongly. This implies that the educational budget per student has decreased over the last ten years (Figure 2-8). As Table 2-1 shows, the growth of the student population at UAS has been positive for more than a decade. By comparison, the number of students enrolled at universities was in decline over the period 1993-98 (Table 2-2). In recent years the number of university students is on the rise again, albeit that the gap between enrolments at UAS and universities is also widening. In the academic year 2007-08, the UAS sector had some 384,000 students whereas some 219,000 students were enrolled at the 14 Dutch research institutions.

Figure 2-2: Student enrolment at UAS (HBO) and universities (WO)



Source: Statistics Netherlands Statline (2009b)

Figure 2-3: Inflow of first years students at UAS (HBO) and universities (WO)



Source: Statistics Netherlands Statline (2009c)

Table 2-1: Student enrolment at UAS in the Amsterdam metropolitan area

	Hs. van Amsterdam	Hs. INHolland*	Amsterdamse Hs. voor de Kunsten	Hs. IPABO	Gerrit Rietveld Academie	**Total Netherlands**
1998	23,986		2,162	947	889	**288,779**
1999	25,346		2,106	1,091	870	**303,388**
2000	25,729		2,179	1,210	862	**312,905**
2001	26,598		2,341	1,233	797	**321,741**
2002	25,164	13,624	2,480	1,301	795	**323,144**
2003	26,740	16,000	2,547	1,478	846	**335,860**
2004	28,557	15,822	2,626	1,673	913	**346,835**
2005	31,223	15,582	2,728	1,794	961	**357,023**
2006	33,575	14,964	2,884	1,774	981	**366,856**
2007	36,193	14,671	2,902	1,681	998	**374,935**
2008	38,139	14,641	2,940	1,451	997	**383,833**

* Numbers are only for the departments of INHolland in the Amsterdam metropolitan region
Source: HBO-raad (2009b), Individual HEIs

Table 2-2: Student enrolment at universities in the Amsterdam metropolitan area

	University of Amsterdam	VU University Amsterdam	**Total Netherlands**
2002	21,469	15,694	**178,553**
2003	22,137	16,413	**188,084**
2004	23,869	17,100	**198,088**
2005	24,906	17,982	**204,436**
2006	25,694	18,651	**207,159**
2007	27,062	19,274	**211,474**
2008	28,331	20,984	**219,018**

Source: VSNU (2009a)

Table 2-3 shows the split in educational programmes offered by UAS and research universities according to the source of funding in 2004. As the table indicates, 35% of all educational programmes (657 out of 1842) are offered by privately funded UAS. Most of these educational programmes are in the domain of economics (Jongbloed et al., 2004: 10-11). In total there were 62 privately-funded UAS in 2004. Among research universities the share of educational programmes provided by privately-funded institutions was negligible: only 33 out of an estimated total of around 1,000 programmes were offered by privately-funded institutes. Most of these educational programmes were in the theology domain. It is estimated that the number of students at privately-funded UAS and research universities is around 60,000 to 70,000 (ibid: 14).

Table 2-3: Public and private funding in higher education

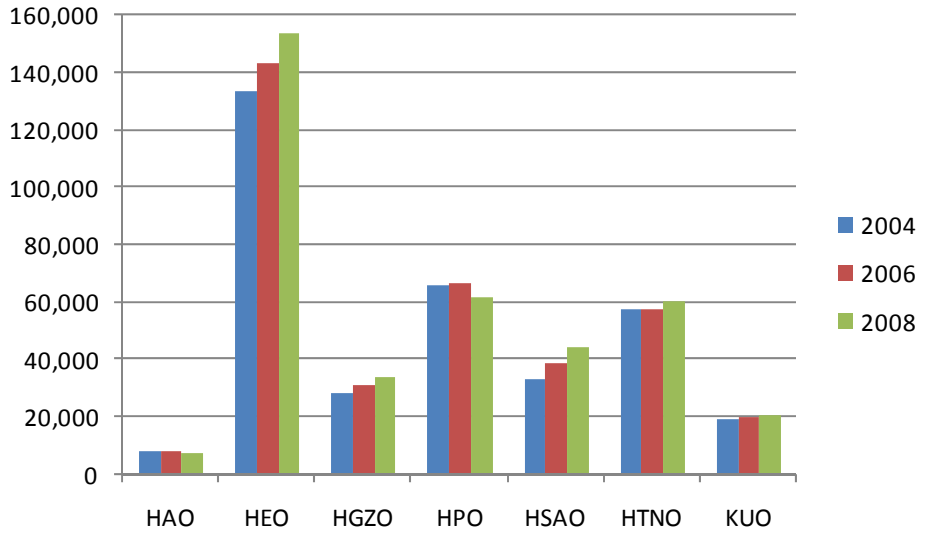
	Number of educational programmes	
	Public funding	Private funding
HBO	1185	657
University	967	33

Source: Jongbloed et al. (2004)

Figure 2-4 is based on a broad classification of educational programmes at UAS into seven different types: *hoger agrarisch onderwijs* (higher agricultural education, HAO), hoger *economisch onderwijs* (higher economic education, HEO), *hoger gezondheidszorg onderwijs*

(higher health care education, HZO), *hoger pedagogisch onderwijs* (higher teacher education), HPO), *hoger sociaal-agogisch onderwijs* (higher behavioral-societal education, HSAO), *hoger technisch onderwijs* (higher technical education, HTNO) and *kunstonderwijs* (art-related education, KUO). As the figure shows, the vast majority of UAS students are enrolled in economics and business-related programmes (HEO). With an increase of over 20,000 students over the last four years, economics and business-related education was the fastest growing sector in absolute terms. In relative terms, the growth in HEO students (15.4%) was surpassed by the growth in health-related programmes (HGZO, 21.4%) and social-behavioral programmes (HSAO, 33.5%). Agricultural (HAO) and teacher education-related (HPO) programmes have become less popular, they faced a decline of over 600 and almost 5,000 students, respectively. Especially the development in the teacher education sector is worrisome, as the labor market for teachers at the primary and secondary level is already plagued by a lack of supply of teachers.

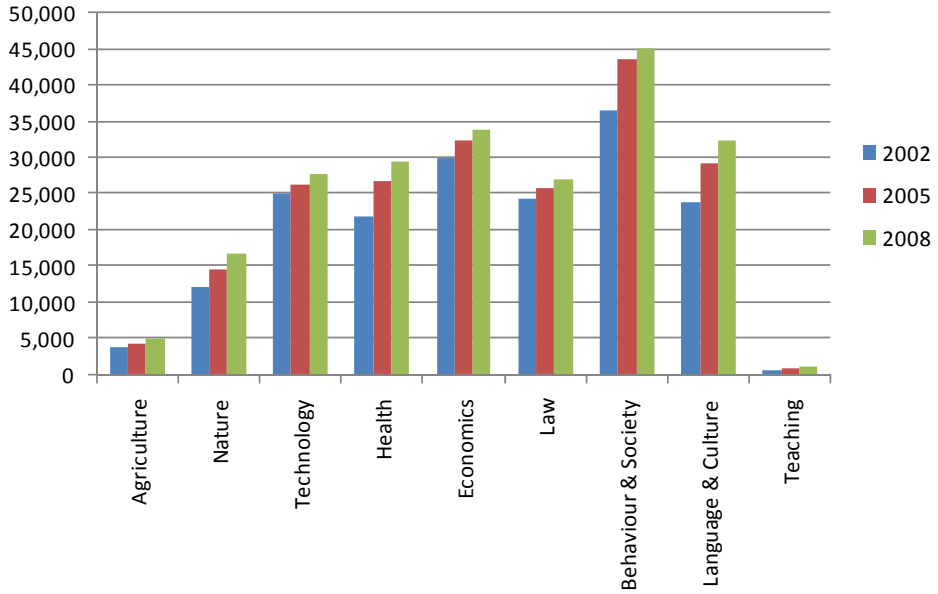
Figure 2-4: Students at UAS by broad disciplines



Source: HBO-raad (2009)

Figure 2-5 gives a broad classification of educational programmes at research universities according to nine different domains: agriculture, nature, technology, health, economics, law, behavior & society, language & culture, and teaching. Most students (more than 45,000) are enrolled in Bachelors or Masters programmes within the behavior & society domain, such as psychology. Over the years 2002-08, the largest absolute increase in students (8,710) is found in the educational programmes related to the theme language & culture. In relative terms, the growth of these educational programmes (35%) was only surpassed by the increase in students enrolled in programmes in the domain nature (an increase of 39%). Contrary to UAS, the student enrolment at universities is on the rise for all educational domains in recent years (over the 1993-98 period the total student population at universities was still in decline). The lowest growth is found among educational programmes related to technology (10%). Interestingly enough, the growth in university students has also been low for the domains economics (13%) and law (11%), which are among the fastest growing areas of interest for UAS students.

Figure 2-5: Students at universities by broad disciplines



Source: VSNU (2009b)

2.2.5 Dutch HEIs in an international perspective

The Dutch association of research universities, the VSNU, uses three different international rankings to measure the competitiveness and quality of the research universities within the Netherlands: 'Leiden Ranking', the 'Academic Ranking of World Universities' (ARWU) of the University of Shanghai, and the ranking published by the 'Times Higher Education Supplement' (THES). The 'Leiden Ranking' is a research ranking published by the Centre for Science and Technology Studies (CWTS) of Leiden University. It is entirely based on bibliometric indicators. The ARWU ranking is also entirely based on research results, but uses a completely different set of indicators: it puts a much greater emphasis on the number of Nobel Prize winners and Field Medal winners, the number of highly cited researchers (HiCi) and the number of articles published in Nature and Science. The THES ranking is based on reputation and educational and research indicators, which are each given a 50% weight.

Table 2-4: Leiden Top 100 European Universities 2000-2007

Position	University
8	Erasmus University Rotterdam
11	Delft University of Technology
15	VU University Amsterdam
18	University of Amsterdam
19	Utrecht University
27	Leiden University
29	Wageningen University
30	University of Groningen
31	University of Maastricht
40	Radboud University Nijmegen

Source: Leiden Ranking (2009)

Table 2-5: Academic Ranking of World Universities (University of Shanghai, 2008)

Position	University
47	Utrecht University
76	Leiden University
101-151	VU University Amsterdam
101-151	University of Amsterdam
101-151	University of Groningen
152-200	Delft University of Technology
152-200	Erasmus University
152-200	Radboud University Nijmegen
152-200	Wageningen University

Source: ARWU (2009)

Table 2-6: World Universities Top 200 (Times Higher Education Supplement, 2008)

Position	University
53	University of Amsterdam
64	Leiden University
67	Utrecht University
78	Delft University of Technology
111	Maastricht University
126	Erasmus University Rotterdam
128	Eindhoven University of Technology
142	Wageningen University
144	University of Groningen
155	VU University Amsterdam

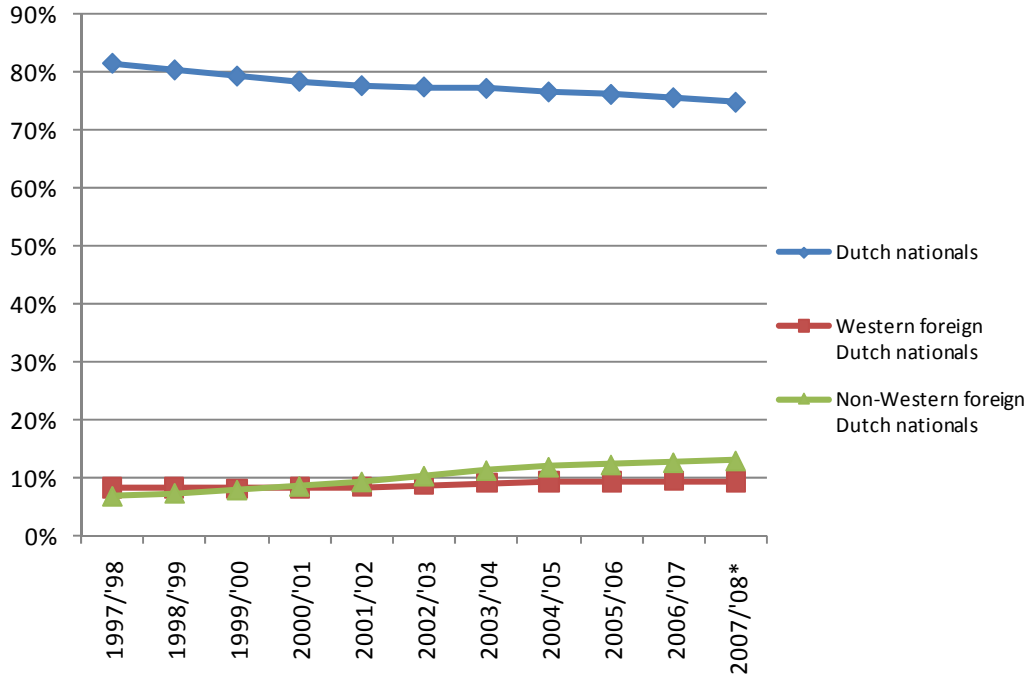
Source: THES (2009)

According to the Leiden Ranking, ten Dutch research universities are amongst the forty best universities of Europe. According to the ARWU ranking, nine Dutch universities are part of the top 200 universities in the world. When looking at the THES ranking, ten universities in the Netherlands are counted amongst the top 200 universities in the world.

2.2.6 Issues and debates

In its 2008 evaluation of the Netherlands tertiary education system the OECD has expressed concern about the relatively low participation of non-Western minorities in higher education in the Netherlands as in other European countries (OECD, 2008a: 52). On the positive side, it noted that total participation is increasing, both in research-intensive universities and HBOs. Indeed, among 17-25 year olds (non-westerners) the participation in tertiary education increased from just 10% in 1995 to 16% in 2002 (De Jonge and Berger, 2006: 50). On the other hand, general participation in tertiary education increased as well. The gap in relation to Dutch nationals or western minorities is still considerable (ibid: 50). Figure 2-6 shows the higher education student population broken down by ethnic group. It signifies that the relative position of non-Western foreign Dutch nationals at HBOs and universities has clearly improved over the past ten years. Their share in the total student population has increased from 7 to 13% over the period 1997/98 to 2007/08. This outstrips the increase of the relative share of foreign Dutch nationals aged 15-25 years in the total population, which increased from 12% to 16% over the same period. At Amsterdam based HEIs the share of foreign Dutch nationals is much higher (see Table 4-2), which reflects the fact that the minorities constitute an important part of the city's population.

Figure 2-6: Participation in tertiary education, relative shares, by ethnic groups



Source: Statistics Netherlands Statline (2009e)

The OECD also concluded that in the Netherlands there is a relatively weak commitment to lifelong learning and professional upgrading in the award programmes that have significant labor market cachet (OECD, 2008a: 12). In 2008 the OECD reported: "In the Netherlands 86.1% of 15-19 year olds are enrolled in education, which is above the OECD average of 80.5% but on par with Western Europe. Participation of the 20-29 year age group in the Netherlands (25.5%) is just above the OECD average (24.7%). After 30 years age participation rates fall well below the OECD average, however. Just 2.9% of 30-39 year olds are enrolled in education as defined by OECD compared to 5.6% in the OECD as a whole, 15.6% in the UK and 13.5% in Sweden" (OECD, 2008a: 12)." In 2009 the situation has hardly improved. Participation in education of the 20-29 year age group in the Netherlands (26.9%) has increased more than the OECD average (25.1%) (OECD, 2008b). Nevertheless, among 30-39 year olds the gap has worsened: just 2.7% is enrolled in education compared to 5.7% in the entire OECD and 13.8% in Australia and Finland (OECD, 2008b). The problem with lifelong learning in the Netherlands may be embedded in social culture: older people do not see award programmes in tertiary education as an option (OECD, 2008a: 12). In addition, the educational system discourages participation of older people: if they have not enrolled prior to 30 years of age higher education students lose their eligibility for student loans and some tuition charges rise steeply (ibid: 12).

2.3 Higher education and the labor market

In the Netherlands, the Research Centre for Education and the Labor Market (ROA) of Maastricht University performs research on the match between education and the labor market, for instance, by making forecasts of the developments in supply and demand in the labor market differentiated by occupation and education. The most recent ROA report, entitled "The labor market differentiated by occupation and education until 2012" (ROA, 2007) predicts good labor market prospects for graduates from universities and UAS. The report estimates that 45% of the graduates at UAS level have good or very good labor market prospects (Table 2-7). Among

university graduates, 61% has followed a study which provides good or very good labor market prospects. The worst shortages are expected to occur in the sectors construction, banking and insurance, catering and professional services, health, and government and education (ROA, 2007: 12). The effects of the recent 'credit crisis', however, have not been incorporated in the ROA report and it is therefore expected that demand for labor in the sectors construction, banking and insurance, and catering and professional services will turn out much lower than predicted.

The demand for labor in the sectors health, government and education is of a more structural nature. A surprising observation is that the labor market prospects for graduates with secondary education (VMBO, HAVO and VWO) are relatively good. One reason is that the demand for workers with only secondary education responds more volatile to economic growth (and in 2007 the model assumed relatively strong economic growth). Another reason is that the labor market prospects for students which follow social-cultural and economic programmes are relatively bad. Another indicator of labor market prospects for students with various educational degrees are unemployment rates per educational level. Unemployment rates are highest for those with only primary education (9.2%). Those with a secondary educational degree are somewhat better off as their unemployment rate is around 6.5%. People with a tertiary educational degree have significantly better chances of finding a job. For those with a bachelors degree (from either a UAS or research university), the unemployment rate is 2.6%. For those with a masters or PhD degree this is 3.3%. The general picture is that the unemployment rate declines with the educational level. One interesting observation, however, is that people with a more practice-oriented tertiary education (MBO and HBO/WO bachelor) have better labor market prospects than those with a masters or PhD degree from a research university. Among all educational levels, those with a more technical-oriented study tend to have better labor market prospects than those who follow a more social/economic-oriented study.

Table 2-7: Labor market prospects per educational level

	Graduates with good or very good labor market prospects for 2007-11 (%)		Unemployment (%)
Primary education	0	Primary education	9.2
VMBO	50	VMBO	6.5
HAVO/VWO	100	HAVO/VWO	6.4
MBO	27	MBO(2&3), MBO(4)	4.6, 3.1
HBO	45	HBO/WO bachelor	2.6
WO	61	WO master, PhD	3.3
Total	44		

Source: ROA (2007), Statistics Netherlands Statline (2007a)

The Netherlands Bureau for Economic Policy Analysis performs regular analysis to establish the demand and supply of workers by social and demographic types. One such analysis is "Labor supply by social-demographic characteristics" (published in 2006, only available in Dutch). The combined job centers run by the government, represented in the Centers for Work and Income (*Centrum voor Werk en Inkomen* or CWI), collect data on vacancies. Partly based on these data and based on the ROA and other government agencies' economic analyses, the Council for Work and Income (*Raad voor Werk en Inkomen*) publishes labor market analyses and forecasts. These

also show a continued high demand for graduates, partly as a result of the ageing of the Dutch society (replacement effect) and the changing structure of the Dutch economy.

2.4 Governance and the regulatory framework

The Netherlands aspires to use its tertiary education resources to help it move into a European leadership position among knowledge-based economies by 2010. The government has strategies to achieve this goal, which are set out in policy documents. The most recent strategic agenda, *Het Hoogste Goed* (MinOCW, 2007b) delineates "an ambitious culture of learning" and "an excellent research climate" as the key objectives for the years to come.

The official central government philosophy since the *Hoger Onderwijs Autonomie en Kwaliteit* (HOAK) policy paper has been to have as little central steering as possible, given the goals to be achieved (Jonge and Berger, 2006: 72). This is also known as the 'state supervising model' as opposed to the 'state control model'. The described philosophy is expressed in the *Wet op het Hoger Onderwijs en Wetenschappelijk Onderzoek* (WHW) (Law on Higher Education and Scientific Research), first issued in 1992 and frequently adapted since.

2.4.1 Federal governance

Four ministries – the ministry of Finance, the ministry of Economic Affairs, the ministry of Education, Culture and Science and the ministry of Agriculture, Nature and Food Quality – are involved in formulating and executing tertiary education policy and resourcing toward this end (OECD, 2008a: 19). The primary responsibility for national funding, programmes and policy advice in higher education is assumed by the Ministry of Education, Culture and Science. The ministry of Agriculture, Nature and Food Quality is responsible for the institutions within the domain of agriculture and natural environment. Apart from the ministries, there is also a great deal of advisory bodies, consultative bodies, intermediary organizations and interest groups that one way or the other influence policy-making. The next paragraph discusses the most important of these organizations. A more complete list can be found in Annex D.

2.4.2 Advisory bodies

The Education Council (*Onderwijsraad*) is a permanent advisory body established by Act of Parliament in 1919. It provides advice, both solicited and unsolicited, to the Minister of Education, Sciences and Cultural Affairs and the Minister of Agriculture, Nature and Food Quality (Onderwijsraad, 2009). Other bodies which advice the government on science an education are: the Socio-Economic Council (SER), the Advisory Council of Government Policy (WRR), and the Advisory Council for Science and Technology Policy (AWT).

2.4.3 Consultative bodies

With regard to higher education, the Minister consults within the Higher Education Consultative Committee (*HO Kamer*) with the HBO Council (*HBO-raad*), Association of Universities (*VSNU*) and teaching hospitals and with the national research organizations (Weert and Broezerooy, 2007: 56). The national student organizations also have a say in higher education policy through the Student Consultative Committee (*Studentenkamer*).

2.4.4 Intermediary organizations

The largest intermediary organizations providing funding for research at higher education institutions are the Netherlands Organization for Scientific Research (NWO) and the Royal Netherlands Academy of Arts and Sciences (KNAW). In addition, these two organizations also perform research. The NWO is the most important intermediate organization in the field of fundamental and strategic scientific research. It is responsible for enhancing the quality and innovative nature of scientific research at Dutch universities and research institutes. To help it achieve these aims NWO receives funding of around EUR 480 million from the government (NWO, 2007: 73, 94). The Royal Netherlands Academy of Arts and Sciences' (KNAW) main objective is to advise the government on matters related to scientific research. The KNAW's budget is about EUR 135 million, mainly consists of government subsidies (KNAW, 2007: 124).

2.4.5 Interest groups

There are a number of interest groups which try to influence higher education policies by lobbying and negotiating with the government. The most important one's are the employers' organizations and the labor unions. Two main organizations represent the interests of the employers: the Confederation of Netherlands Industry and Employers (VNO-NCW) and the Royal Association MKB Nederland. The interests of the employees are promoted by the labor unions, of which the largest are the Federation of Dutch Labor Unions (FNV) and the National Federation of Christian Trade Unions (CNV).

2.5 Funding

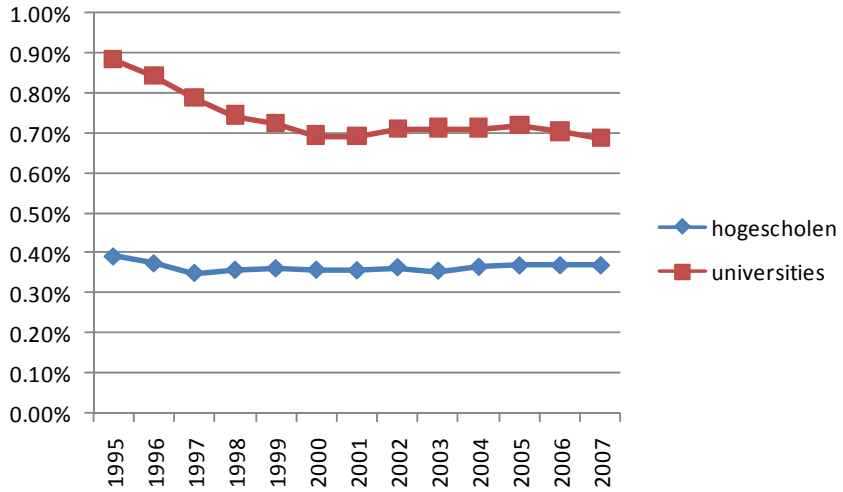
There are two major sources of income for institutions of higher education: public funding and private contributions from students and businesses. The universities speak of three budget streams: two public ones and one private one:

- Public formula funding goes directly to institutions of higher education for all their tasks (first stream);
- Another stream of public funding goes via the research councils (NWO, KNAW) to research proposals in competition (second stream);
- Private income from tuition fees, commissioned research or other tasks, business contracts (third stream).

Apart from the above funding streams, there are tuition fees paid by the students. The first stream of funds represents the core funding of the HEIs. The first flow of funds for both the universities and the UAS is supplied by the Ministry of Education, Culture and Science. Agricultural institutions (one university and six UAS) receive their grant from the Ministry of Agriculture, Nature and Food Quality (Weert and Broezerooy, 2007: 45). As Figure 2-7 shows, public expenditure on higher education has been decreasing steadily (relative to GDP) for the past decade. In this respect, the research universities have encountered the steepest drop in public funding support. In 2007, the institutional support from public sources was approximately EUR 6 billion (Statistics Netherlands Statline, 2008e). This represents an estimated 79% of total support, with approximately 21% provided by private sources such as tuition fees and private contributions (OECD, 2008a: 41). Private support for institutions from tuition fee income and private contributions has been increasing slowly. A decade ago, private support made up approximately 19% compared to the current 21% (OECD, 2008b). In addition to publicly funded universities and UAS, there are a number of "designated" institutions which are formally part of the higher education system. Their educational programmes are officially recognized but they do

not receive funding from the government, although their students are eligible for student support (Weert and Broezerooy, 2007: 43).

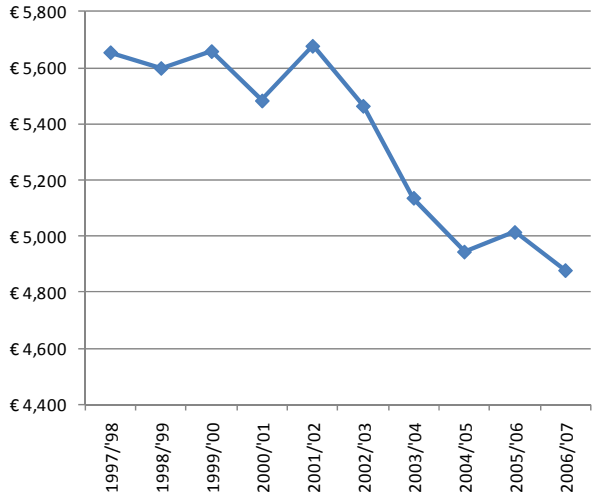
Figure 2-7: Public funding of universities and *hogescholen* (% of GDP)



Source: Statistics Netherlands Statline (2008)

First stream funding consists of four components: an educational budget, a research budget, facilities for medical students and facilities for university medical hospitals. As was pointed out in § 2.2.4, over the past decade the publicly funded educational budget of universities has remained more or less stable. In real terms the publicly funded educational budget of universities has increased only slightly from EUR 3.0 billion in 1998 to EUR 3.2 billion in 2006 (VSNU, 2008d). Over the same period student numbers have increased from 289,000 to 367,000. This implies a steep decline in the publicly funded educational budget per student, as is illustrated inFigure 2-8. The publicly funded research budget of universities has even declined in real terms over the last decade, from EUR 1.6 billion in 1998 to EUR 1.5 billion in 2006 (ibid, also see Versleijen et al., 2007).

Figure 2-8: Publicly funded educational budget of universities (per student)



Source: VSNU (2009d)

An overview of the absolute size of the different funding streams received by some of the HEIs in the Amsterdam metropolitan region is given in Table 2-8.

Table 2-8: Funding of HEIs in the Amsterdam metropolitan area by budget stream

	Total income	1st stream	2nd stream	3rd stream
University of Amsterdam	586.4	395.3	26.9	164.2
VU University Amsterdam	398.6	245.0	20.0	133.6
Hogeschool van Amsterdam	232.3	159.4	-	72.9
Hogeschool INHolland	265.9	188.5	-	77.4
Gerrit Rietveld Academie	-	-	-	-
Amsterdamse Hogeschool voor de Kunsten	48.2	41.8	-	6.3
Hogeschool IPABO	15.1	11.5	-	3.6

Source: Annual reports individual HEIs, NWO (2008)

Over the past decade, institutions have gained more autonomy, including ownership of their own campuses and capital facilities. Formula based, lump sum budgeting has replaced a more centralized, regulatory approach. The lump sum allocations (first stream) are based on relatively simple formulas for distribution of financial support among both types of institutions in the binary system. For universities, these lump sum amounts of public funding consist of a teaching component and a research component. Institutions' teaching budgets, exclusive of research, are made up of a base funding component, representing 37%, a performance component calculated from the number of diplomas, representing 50%, and a component based on the number of first year students, representing 13% (OECD, 2008a: 42). These relative shares are fixed, which means that in absolute terms the budgets for HEIs are fluctuating in accordance with the number

of diplomas awarded and the number of first year students. With respect to the research component, most funds are fixed allocations per university, based on historical reasons (Weert and Broezerooy, 2007: 52). However, with the introduction of the Bachelor-Master model, the link between the research budget and the number of diplomas (both Bachelor and Master) is again reintroduced (ibid: 52). For UAS, total enrolment is used and dropouts are considered as well as students receiving diplomas. To improve UAS efficiency, another factor is added to the formula to encourage timely completion. UAS traditionally do not receive research funds. During the build up of the *lectoraten* the UAS received a SKO-subsidy, a support which however has currently been stopped.

The current funding framework of HEIs has a number of characteristics which impede competition within the higher education sector. First of all, only approximately 10% of public research funding of research universities consists of funding allocated on academic grounds by the principal research funding agency, based on evaluation of research excellence and competitive funding for projects and programmes (OECD, 2008a: 27). Secondly, the tuition fees are set at the national level (for the academic year 2008-09 the standard fee is EUR 1565), which limits the financing possibilities on the revenue side of HEIs' budgets. In 2006, the then state secretary of the Ministry of Education, Culture and Science proposed a new funding structure which was to transform the Dutch higher education system into a more differentiated and market-driven system where students and institutions would obtain more freedom and more responsibility (MinOCW, 2006b). Central idea of this system was the provision of learning entitlements which would allow students to 'cash' their entitlements for (parts of) education at any place and time (Weert and Broezerooy, 2007: 53). This in order to increase the freedom and flexibility of students in choosing an institution to follow a Bachelor or Master programme. While the system of learning entitlements was originally scheduled to be introduced in the academic year 2007-2008, the current government has hitherto been against it.

2.6 Regional dimension 'inside' the national higher education policy

The Netherlands is a relatively small country with 13 research universities and 14 government-funded UAS located within its territory. In more or less every region access to higher education is adequate. The location of most HEIs have a historical background that goes back for decades if not centuries. In the 1960s the government founded some new universities (Twente and Maastricht) within the aim of developing the region concerned. Since then the government has embarked on a policy of de-regulation of higher education. The Dutch system for higher education is nowadays characterized by a high level of autonomy for HEIs. HEI's have control and ownership of their campuses and finances. Due to lump sum budgeting they can set their own goals and strategy to achieve their goals. The national governments' role has shifted from a state control model, prescribing the activities of HEIs, to a more detached supervisory model, involving evaluation of output. The state has no role in the content or location of new studies programmes and courses. The government just checks the relevance to the (national) labor market or unwanted competition with existing studies within the region where a new field of study is put forward for funding. The quality is checked by the Netherlands-Flanders Accreditation Organization (NVAO). It is argued that the process of de-regulation leads to more regional involvement. According to the OECD (2008a: 42), "de-regulation of tertiary education has allowed institutions more flexibility and seems to be paying off with increased institutional cooperation and innovation. Institutions have merged with one another, worked together to create more programmes bases on student's needs, and developed better working relationships in their respective regions, according to anecdotal evidence gathered in numerous interviews with institutional administrators." Due to the autonomy of the HEIs there is not a specific regional dimension in the Dutch higher education policy. It depends on the individual HEI to what extent

they focus on the region. Along the same lines, Sijgers et al. (2005) concluded that regional considerations only played a minor role in policy-making. This role is slightly more developed for UAS, due to their function to educate professionals for the labor market. Conversely, research universities focus more on the advancement of research skills in particular.

Earlier in this chapter it was emphasized that a few years ago *lectoraten* have been introduced in the higher education system. This is an important development within UAS and for their contacts with the region. With these *lectoraten* UAS can work on their relation with the regional labor market and corporate life. UAS are explicitly assigned to become a knowledge partner of the professional practice in a broad association. This brings UAS closer to corporate life (and local government).

Although there is no explicit regional dimension in the Dutch policy framework on higher education, there still are some programmes to stimulate the cooperation of HEI's with other HEI's (research universities and UAS), local government and local corporate life (i.e. SME's). Examples of these are Pieken in de Delta, RAAK and the funding of structures for the local educational labor market (teacher academies and the schools –as employers- in areas with a high expected shortage of teachers for primary or secondary education are stimulated to work together towards solutions for their local situation).

Box 2-2: National programmes that stimulate regional cooperation

Pieken in de Delta

In 2004 the Ministry of Economic Affairs launched *Pieken in de Delta*, a policy to strengthen the national economy by focusing on specific areas with potential. In these areas there is a key role for knowledge institutions like HEIs. According to Pieken in de Delta the priorities are business parks, mainports (Amsterdam Airport and the Rotterdam Harbor), infrastructure, innovation and urban economies. One of the designated areas is the North Wing of the *Randstad*, which in this definition includes both the Amsterdam metropolitan area and the province of Utrecht. The Pieken programme for the North Wing focuses on the following clusters : the creative industry, tourism, innovative logistics and trade, life science (including the medical cluster) and knowledge intensive business services (MinEZ, 2004: 53-8). The mission of this part of the Pieken agenda is to develop the North Wing of the Randstad as a top region in Europe. It creates the conditions for the business development of world class activities within the designated areas. For 2009, there is a budget of EUR 17 million to foster this aim. The allocation of these funds proceeds bottom-up. Interested parties must tender for a subsidy or credit. The ministry of Economic Affairs finances a maximum of 50% of the public investment. The other half must come from local authorities like city councils and provinces. In the Amsterdam region, the *Amsterdam Topstad* initiative profits from the Pieken in de Delta funds.

RAAK

The Regional Action and Attention for Knowledge Innovation (RAAK) is an arrangement of the Department of Education (Stichting Innovatie Alliantie, 2009). It intends to strengthen the relationship between UAS, regional training centers and SMEs to transfer knowledge (OECD, 2008a: 74). Approximately EUR 6-8 million is available on a yearly basis. Nowadays RAAK has been broadened to include the public sector also.

The Dutch associations for UAS and research universities, the HBO-raad and VSNU, respectively, also stimulate their members (the HEI's) to cooperate on a local level, although the

decision is up to the HEI itself. In the Green Paper *Towards A New Organizational Agenda*, the HBO-raad voices its expectation that there will be a broad variance within institutions (HBO-raad, 2009c). Some will focus on international development, others will focus on cooperation with secondary education and companies in their region. Furthermore, in 2007 VSNU and HBO-raad together with many other organizations, like employers organizations for multinationals and SMEs, signed a declaration *Kennis Verzilveren* to work together on the development of exploitation of knowledge. The Ministry of Education, Culture and Science (OCW) states in its strategic agenda for higher education, research and science policy, *Het Hoogste Goed*, that the cooperation between HEIs and corporate and social organizations should be strengthened (MinOCW, 2007b). Both institutions can learn from each other and it is important to ensure that action taken is compatible with the time scale of labor market fluctuations.

2.7 Regional higher education system and governance

In the Netherlands the governance of higher education is predominantly a national affair. It is the minister of education (OCW) who ultimately is responsible for the proper functioning of the HE system. His most recent strategic agenda for higher education (MinOCW, 2007b) shows that the Dutch government aims to strengthen the autonomy of the HEIs as the executive bodies of this strategy, stating that the role of the government should be one of securing the right framework conditions to safeguard the public goals of higher education, such the quality, accessibility and efficiency of higher education.

This governance structure means that there no official role in higher education for other governmental layers such as the provinces or the city councils. By and large the Amsterdam HEIs are autonomous organizations. They operate in a national legal framework and receive the main part of their budget directly from the ministry of education (see table 2.8). This makes the minister of education their main ‘principal’.

Chapter 6 of this report further discusses the governamce structure of the HEIs in the Amsterdam region and their relationships with other stakeholders.

3 CONTRIBUTION OF RESEARCH TO REGIONAL INNOVATION

3.1 Introduction

This chapter focuses on the contribution of research to regional innovation. Key issues that will be discussed are:

- The Dutch government's policy on innovation;
- The regional innovation strategy of the Amsterdam metropolitan region;
- Key clusters of economic activity with a high innovation potential;
- The interaction between Amsterdam HEIs and regional needs and demands;
- Interfaces facilitating knowledge exploitation and exchange.

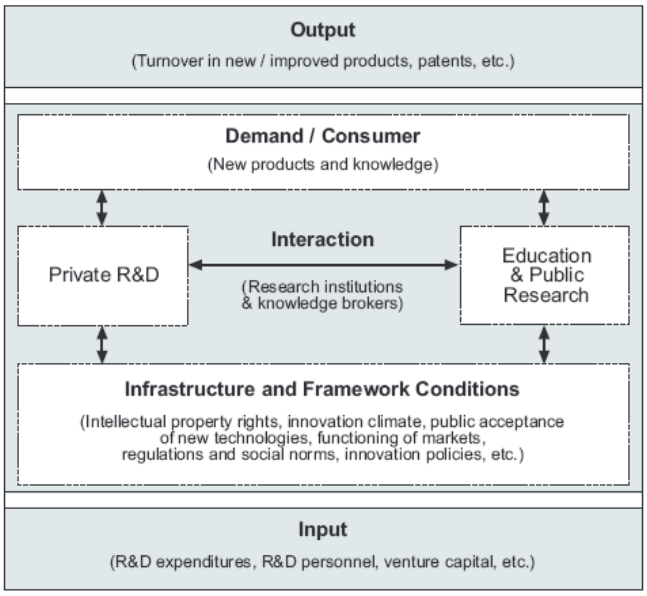
Section 3.2 presents a theoretical framework of the Dutch innovation system, followed by the national legal and funding framework. Section 3.3 explains how the Amsterdam metropolitan area is positioned in the national innovation strategy. Section 3.4 analyzes the regional innovation strategy of the Amsterdam metropolitan region. Section 3.5 discusses the importance of innovative clusters for the local economy. Section 3.6 analyzes to what extent HEIs in the Amsterdam region respond to regional needs and demands. Section 3.7 discusses what mechanisms have been developed at HEIs to commercialize their research base and to promote technology exchange with regional stakeholders. Section 3.8 summarizes and concludes.

3.2 Framework conditions for promoting research and innovation

3.2.1 A theoretical framework

A basic typology of the Dutch innovation system is illustrated in Figure 3-1. According to a report published by the OECD, in the Netherlands output and productivity of both public and private R&D efforts – in terms of patents and publications – stand out favorably in international benchmarking. However, output in terms of new or substantially improved products in sales is substantially below EU average (OECD, 2003: 9). Overall, the report concludes that the favorable score on (public) research output contrasts with the score on economic output (labor productivity growth, output in terms of new or substantially improved products in sales, etc.), pointing to inefficiencies in market and non-market interactions within the innovation system (ibid: 9). In this respect, the weakest element of the Dutch innovation system lies in the inadequate interaction and ineffective institutional arrangements between the science and business system with low levels of knowledge transfer between universities and companies as a consequence (Klomp and Roelandt, 2004: 371). In the Netherlands, the quality of scientific research is high but the level of knowledge commercialization is below international standards (ibid: 371). The Dutch policy challenge is therefore to combine excellent research output with an increasing level R&D collaboration between Higher Education Institutions (HEIs) and businesses (ibid: 371).

Figure 3-1: Components of an innovation system



Source: OECD (2003: 9)

Modern innovation models describe the network of relationships among academia, industry, and government as an overlay of reflexive communications that increasingly reshape the institutional arrangements. (Etzkowitz and Leydesdorff, 2000: 109). The linear innovation model either expressed in terms of ‘‘market pull’’ or ‘‘technology push’’ was insufficient to induce transfer of knowledge and technology. Publication and patenting assume different systems of reference both from each other and with reference to the transformation of knowledge and technology into marketable products (ibid: 110). Modern, non-linear, models of innovation extend upon linear models by taking interactive and recursive terms into account. These non-linear terms can be expected to change the causal relations between input and output (ibid: 114). There are several modern non-linear innovation models that can be used to conceptualize the interaction between HEIs and industry in relation to research and innovation.

Gibbons et al. (1994) argue that a new form of knowledge production started emerging from the mid 20th century which is context-driven, problem-focused and interdisciplinary. It involves multidisciplinary teams brought together for short periods of time to work on specific problems in the real world. Gibbons et al. label this ‘mode 2’ knowledge production. This is to be distinguished from traditional academic, investigator-initiated and discipline-based knowledge production, which they label ‘mode 1’. Other innovation models that are indicative of flux, reorganization, and the enhanced role of knowledge in the economy and society are ‘national systems of innovation’ (Edquist, 1997), ‘research systems in transition’ (Cozzens et al., 1990; Ziman, 1994) or ‘the post modern research system’ (Rip and Van der Meulen, 1996).

The Triple Helix configuration of university-industry-government relations assumes that a network of overlay communications, networks and organizations continuously reshapes the institutional arrangements in the innovation system. Most countries and regions have presently attained what Etzkowitz and Leydesdorff (2000: 111) call Triple Helix III type of innovation model; a knowledge infrastructure in which the three institutional spheres are overlapping, with each taking the role of the other and hybrid organizations emerging at the interfaces. The common objective is to realize an innovative environment consisting of university spin-off firms, tri-lateral initiatives for knowledge-based economic development, and strategic alliances among firms (large and small, operating in different areas, and with different levels of technology), government laboratories, and academic research groups (ibid:112).

Bodas Freitas and Verspagen (2009) have developed a theoretical framework to conceptualize the interaction between HEIs and industry in relation to research and innovation in the Netherlands. This theoretical framework asserts that knowledge transfer between HEIs and industry is inherently problematic. First of all, the process by which knowledge among HEIs gets into practice is complex, interactive and risky. Technological and market problems seem to be the biggest risks in the process of bringing knowledge into industrial innovations, independent of whether this process can be characterized as supply-push or demand-pull. Secondly, researchers at HEIs and industry collaborate for very different reasons: somewhat oversimplified, university researchers have incentives to concentrate on fundamental and theoretical research, publishing their research results, being recognized by their peers and assuring their tenure; while industrial researchers are driven to focus on applicability and appropriation of the generated knowledge, on commercially viable technologies, and on solving technological problems. Thirdly, collective HEI-industry knowledge production and especially the attribution of its research results may be problematic because it requires finding a common agreement on a balanced level of appropriation by the participating firm and of public diffusion of results.

Given the difficulties inherent to the process of bringing inventions into practice as well as in bridging university and industrial motivations towards collaboration, policy measures are now widely present in developed countries. In particular, to encourage knowledge transfer between university and industry, policy-makers introduced public sponsoring to collaborative research projects, stimulated the establishment of university's Technology Transfer Offices (TTOs) and part-time professorships, and pushed for more active use of university property rights (ibid: 6). Public research sponsoring may help bridging HEI and industry motivations for collaboration in R&D as well as for engaging in efficient translation of new scientific advances into commercially viable technologies and products (Lee and Gaertner, 1994).

3.2.2 National legal framework

The Dutch legislation on the ownership of Intellectual Property Rights (IPRs) is embodied in the Intellectual Property Act (*Rijksoctrooiwet*) of 1995. The Dutch Intellectual Property Act (IPA) stipulates that when someone conducts research at a university, UAS or research institution, the patent entitlement belongs to the university, UAS or research institution.

As a result, only the HEI can enter into arrangements to exploit the IPRs generated in the institutions. Further, HEIs themselves are allowed to set framework conditions regarding the ownership of IPRs. In general terms, there are three different modes:

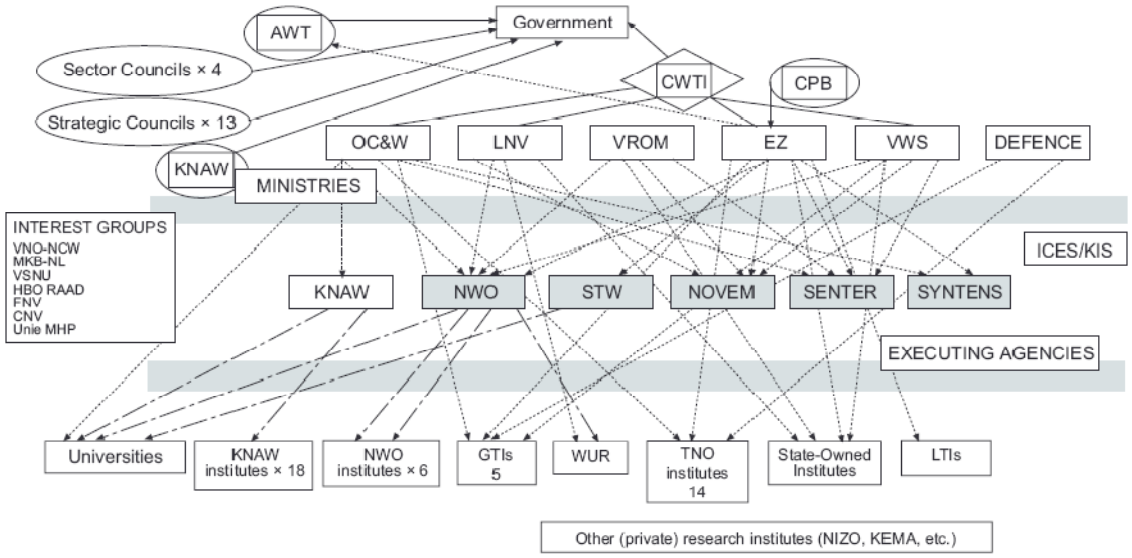
- IPRs generated via HEI-financed research: in this case the HEI owns all rights to the IPR;
- IPRs generated in the framework of a (research) contract for a particular (large or small) company: HEI can enter into a contract specifying who owns what and which party owns the right to exploit the IP generated from this contract;
- IPRs generated in a research consortium: a research consortium formed to carry out a project under a European Framework Programme – the terms for exploitation are written down in a Consortium Agreement among the partners and at the end of the project the partners have to submit an exploitation plan. Most often, the results are co-owned by all partners, although exceptions are possible.

The University of Amsterdam (UvA), for instance, has the following division rule for revenues obtained from inventions made by its employees: one-third goes to the inventor, one-third to the faculty where the inventor is employed, and one-third to the *Octrooifonds* (a fund established by the university to pay for the costs associated with patent requests).

3.2.3 National funding framework

The Dutch innovation policy network consists of an extremely complex network of actors (Figure 3-2). The central government allocates its budget to the ministries (OCW, LNV, etc.), which on their part channel funds to the intermediary bodies (KNAW, NWO, etc.) or directly to the universities or research institutions such as the Organization for Applied Scientific Research (TNO). As a result of this complicated network, the organizations at which industry and HEIs can apply for resources to finance their collaborative ventures are numerous.

Figure 3-2: Actors in the field of Dutch innovation policy



Source: OECD (2003: 13)

The Dutch central government's attitude towards innovation policy has changed profoundly since its Innovation Letter (*Innovatiebrief*) from 2003 (MinEZ, 2003). In this White paper the government acknowledges that in terms of innovative strength the Netherlands is at the European average. It states that the Netherlands risks losing momentum and may fall behind other European countries, unless drastic action is taken. By employing a new innovation strategy the government aims to reach 3% GDP spending on R&D goal stated in the Barcelona declaration and wants the private sector to contribute to 2%. The Innovation Letter proposes three policy measures to strengthen the Dutch innovation climate:

- Fiscal measures to stimulate private R&D;
- A new instrument to finance knowledge valorization and stimulate cooperation in R&D between companies and between knowledge institutions and companies. This new instrument aims to give a new impulse to the valorization effort of knowledge institutions and private parties (MinEZ, 2009a);
- Prevent a shortage of knowledge workers.

These policy measures are primarily generic in the sense that they create the right conditions for a strong innovative climate. The most important one is the fiscal stimulus package to promote private R&D (called the *Wet Bevordering Speur- en Ontwikkelingswerk*, WBSO). This package consists of tax advantages for SMEs financed from labor tax revenues. In 2004, the Ministry of Economic Affairs had a budget of EUR 762.2 million to spend on innovation in SMEs of which

53% was financed from the WBSO. SenterNovem, an agency of the Ministry of Economic Affairs, is responsible for allocating the WBSO funds to companies. Aside from executing the WBSO, SenterNovem is also responsible for a host of other innovation programmes. There is an additional largely governmentally funded organization, Syntens, which is charged with giving practical advice to entrepreneurs on the programmes run by SenterNovem (Syntens, 2009).

The Innovation Letter White paper implied a shift in the Dutch governments' innovation agenda but was still very generic in nature. Following a 2003 policy paper from the Advisory Council for Science and Technology Policy (AWT), the government has decided on a more tangible policy of 'backing the winners' (AWT, 2003). The general idea is to concentrate the innovation funds on science and industry fields in which the Netherlands has proven or potential strengths. The resulting policy, put forward in the 2004 White paper *Pieken in de Delta*, implied a radical shift from a policy of stimulating regions with the aim of achieving economic equality towards one of exploiting regional comparative economic advantages. With this agenda, the government intends to boost the competitive and dynamic nature of the Dutch economy as part of a strong and innovative Europe (ibid: 17). A region-oriented innovation policy is a crucial part of this ambition, which means that the government supports regional innovation processes which have regional implications (vocational education, technology transfers, stimulate starting entrepreneurs and knowledge networks), as well as those that are internationally important (such as when a region is an international 'hot spot' in a particular field). Many of the goals outlined in *Pieken in de Delta* aim to improve the cooperation between industry and HEIs. Examples are:

- A strengthening of the link between the industry demand for knowledge and knowledge production at educational institutions (MinEZ, 2004: 40);
- A more active entrepreneurial policy based on the potential of the knowledge infrastructure: spatial accommodation around universities (science parks, incubators, techno-startups) (ibid: 40);
- Organizational clustering of overlapping economic activities: organization of regional networks of companies and researchers around specific themes (ibid:40).

In 2003, the Dutch government has established the Innovation Platform (*Innovatieplatform*), a consultative body chaired by Prime Minister Balkenende which brings together key players in the knowledge economy: experts from politics, business, research and education. The platform is charged with the task of creating the conditions, establishing the connections and developing the vision required to stimulate innovation and entrepreneurship in the Netherlands. It furthermore aims to streamline the complex network of organizations in the innovation network. One of the initiatives taken by the Innovation Platform has been the creation of a national innovation agenda, the Knowledge Investment Agenda 2006-2016 (*Kennisinvesteringsagenda 2006-2016*, KIA). KIA is an *investment* agenda directed towards the entire chain of education, research, innovation and entrepreneurship (Innovation Platform, 2006: 7). Like the Innovation Letter, it is based on the observation that the Netherlands takes a strong position in Europe as a knowledge economy, but has to invest more in research and innovation in order to keep up with other EU countries. The main ambition presented in the KIA agenda is to develop the Netherlands into a top quality knowledge society. However, reaching this ambition requires substantial investments in education, research and R&D. Private R&D expenditures in the Netherlands amount to approximately 1% of GDP (OECD, 2006), while the Barcelona declaration states that this should be 2%. Government spending on R&D is approximately 0.7% and needs to be increased to 1% to meet the Barcelona goals. The total additional investments which are needed according to the KIA amount to EUR 3.5 to 6 billion for both the government and the private sector (SER, 2008: 121). However, the business sector participating in the Innovation Platform has only committed to an additional EUR 200-400 million euro of R&D spending (ibid: 121). Hence, the main

challenge for the years to come will be to actually convince the private sector to increase spending on R&D.

On the other hand, public R&D sponsoring in the Netherlands provides an enormous stimulus to university-industry collaboration (Bodas Freitas and Verspagen, 2009: 17). Dutch research sponsors provide an organizational and interaction framework for the university-industry collaborative projects. SenterNovem executes a number of publicly-funded programmes which aim to promote the interaction between industry and HEIs. For example, the programme Subsidizing Investments Knowledge Infrastructure (*Besluit Subsidies Investeringen Kennisinfrastructuur*) is directed towards matching the supply and demand of knowledge between universities and companies (SenterNovem, 2009). Another example is the Innovation Voucher (*Innovatievouchers*). These are virtual coupons which can be traded by entrepreneurs for knowledge available at universities and research institutions. The Netherlands Bureau for Economic Policy Analysis (CPB) has evaluated the effect of innovation vouchers on innovation over the period 2004-05. It concludes that innovation vouchers have resulted in significantly more improvements in production processes (Cornet et al., 2007). No effects are found for other types of innovation – new products, product improvements and new processes. Another finding is that the innovation vouchers have resulted in significantly more contract research awarded to universities that would otherwise not have been awarded. Although there are indications that Innovation Vouchers lead to more innovation, a cost-benefit analysis of the vouchers is has not been conducted (ibid).

Another policy taken by the Dutch government to promote cooperative research between HEIs and industry is the institutionalization of part-time professorships with specific regulations as a form of knowledge transfer. Indeed, the exchange of industry and university positions, allowing the expansion of their social and industrial networks and market awareness, seems to make researchers more productive in developing industrial innovations (Dietz and Bozeman, 2005). Furthermore, projects involving part-time professors are more likely to benefit from public research sponsoring and being implemented in PhD theses (Bodas Freitas and Verspagen, 2009: 18). In the Netherlands, the government has recently acted towards accommodating the growing need for applied research in the HBO sector by introducing *lectoraten*. There are currently almost 400 lectors working at UAS (HBO-raad, 2008b). The job specification of a lector is to transfer knowledge to industry (SMEs) and society in general and to develop applications of knowledge on demand. Initially, the required funds to appoint lectors were for 50% financed by the Foundation Knowledge Development HBO (SKO), and thereby indirectly by the government (SKO, 2008: 18). Currently, the SKO-subsidy has been stopped and the UAS finance the lectoraten out of their own budgets.

Finally, university TTOs are another form of knowledge transfer that has become increasingly widespread in OECD countries (Bodas Freitas and Verspagen, 2009: 7). The task of the TTOs is to encourage technology transfer to industry and the valorization of university knowledge. The growing use of TTOs has been attributed to the clarification of university patenting rights as well as with campaigning for university entrepreneurship (ibid: 7). In the Netherlands, TTOs are particularly involved when university researchers are confronted with the need to set up a spin-off, or to apply for management and training subsidies. Additionally, university researchers often use TTOs when they need help with assessing the patentability of some specific scientific result or in setting up a licensing agreement (ibid: 19). Nowadays all 14 publicly funded universities in the Netherlands have their own TTO to support technostarters and improve cooperation between researchers and industry.

3.3 The Amsterdam metropolitan area in a national innovation strategy

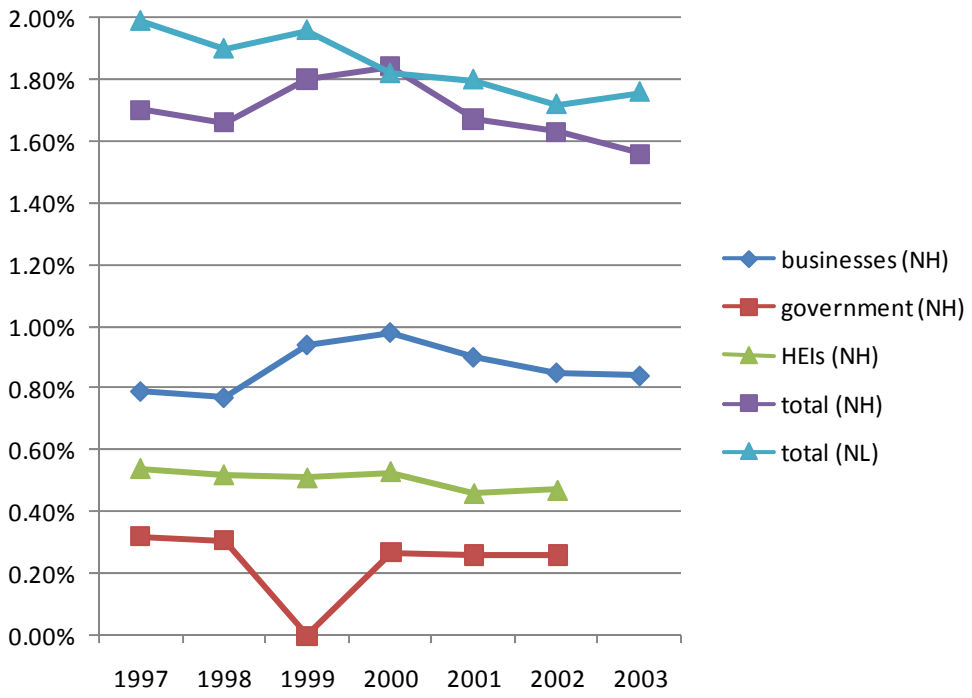
In the Dutch government's economic agenda *Pieken in de Delta*, the North Wing (which includes the Amsterdam metropolitan area, as well as the city region of Utrecht) is designated as one of the six economic regions which are key for future national economic growth. The North Wing region contributes around one-third of total national employment, with airport Schiphol as the most important economic engine of the region (MinEZ, 2004: 53). The Pieken agenda focuses on the following clusters for this region: the creative industry, tourism, innovative logistics and trade, life science (including the medical cluster) and knowledge intensive business services (ibid:53-8). It acknowledges the strong knowledge infrastructure in the Amsterdam region, but outlines a strengthening of the interaction between HEIs and businesses as a key priority for the years to come. In 2004, the government has budgeted EUR 769 million for region-oriented economic policy for the period 2004-08, which is replenished by another EUR 3.3 billion from the European Regional Development Fund (*EU-structuurfondsen*). In executing its policy, the government allocated large parts of this budget to the following intermediary bodies:

- The Regional Development Corporations (NOM, NV Oost, BOM and LIOF);
- Syntens (innovation platform which aims to promote interaction between SMEs and HEIs);
- SenterNovem (agency of the ministry of Economic Affairs that aims to promote sustainable development and innovation).

3.4 Regional innovation strategy of the Amsterdam metropolitan area

Since 2005 the Amsterdam metropolitan area has its own Regional Innovation Strategy (RIS). This agenda has been formulated by a collaboration of regional stakeholders such as the Netherlands Chambers of Commerce (*Kamers van Koophandel*), the association of SMEs, i.e. MKB, Syntens, the *Amsterdamse Innovatiemotor* (AIM), iMMovator, Kenniskring Amsterdam (KKA) and several others. The starting point for the RIS is that much needs to be improved in the innovative capacity of the metropolitan region Amsterdam. As Figure 3-3 indicates, the metropolitan region indeed lagged behind the Netherlands as a whole over the period 1997-03 when the innovative capacity is measured by R&D expenditures as a percentage of GDP. Moreover, R&D investment by businesses, government and education sector in Noord-Holland shows a negative trend over this period.

Figure 3-3: R&D expenditures in Noord-Holland (NH) and the Netherlands (NL) as a % of (regional) GDP



* Data on regional R&D expenditures are only available until 2003
Source: Eurostat (2008)

The RIS also identifies several bottlenecks of innovation in the metropolitan region. For instance, there are many initiatives and organizations which are somehow supporting innovative and knowledge-intensive businesses, implying a dispersion of responsibilities and a lack of continuity (KVK, 2008: 17). Another point is that educational and research institutions are insufficiently exploited as a source of innovation, in the sense that the number of start-ups, spin-offs, as well as the knowledge transfer from HEIs to companies, is unsatisfactory. Furthermore, new innovative companies often experience difficulties in obtaining sufficient financial capital. Despite the fact that enough financial capital is made available, the entrepreneurs are often unable to find the suppliers of capital or write inadequate business plans. In other words, demand for and supply of capital often do not match. In response to this issue, the *Amsterdamse Innovatiemotor* (AIM), has launched a financing desk (*financieringsdesk*); a website that links entrepreneurs with suppliers of financial capital. Other key priorities that are stated in the RIS are the need for large-scale business parks and the international promotion of the Amsterdam metropolitan area as a highly innovative region with a good living and working climate, for instance by organizing a variety of events with an international profile.

Box 3-1: Innovation in the Amsterdam metropolitan region, key organizations

Pieken in de Delta Noordvleugel: *Pieken in de Delta* programme of the Ministry of Economic Affairs; allocates funds to support projects in the Amsterdam metropolitan region in the following five designated areas: creative industry, tourism, innovative logistics and trade, life sciences (including the medical cluster), and knowledge intensive business services. *Pieken in de Delta* is

a nation-wide innovation programme that identifies promising clusters and makes funds available to stimulate these clusters. However, it is not an executive body that distributes the funds to specific micro scale initiatives. This task has been given to SenterNovem.

Subsidieprogramma Kennisexploitatie (SKE): SKE is an initiative of TechnoPartner, an organization established by the Ministry of Economic Affairs and the Ministry of Education, Culture and Science. SKE provides subsidies to knowledge institutions and companies with the goal to support 'techno-starters'.

Syntens: Innovation network that helps to connect SME entrepreneurs with knowledge institutions. It provides information and advice to SMEs in order to promote innovation in businesses. Syntens is a foundation financed with government funds, primarily from the Ministry of Education, Culture and Science. Syntens employs 270 innovation advisors and provides 20,000 advises to SMEs yearly. It has 15 branches in the Netherlands, including one in Amsterdam.

Netherlands Chambers of Commerce (Kamers van Koophandel): The Netherlands Chambers of Commerce manages the trade register for the entire business sector. The Chamber's other tasks are to provide Dutch entrepreneurs with information, stimulate regional trade and industry, and advise local and regional government. There are 44 Chambers of Commerce in the Netherlands, of which six are located in the Amsterdam metropolitan region. The Chambers of Commerce also have a regional agenda. They identify regional and local priorities and develop a vision on the regional and local economy. Based on this vision the Chambers of Commerce develop activities to stimulate the regional and local economy.

***Amsterdamse Innovatiemotor*:** The *Amsterdamse Innovatiemotor* (AIM) is an innovation network established by local governments, research universities, Chambers of Commerce and the banking sector. It is an initiative of the Kenniskring Amsterdam. AIM's aim is to maintain and consolidate the leading position of the Amsterdam region in the knowledge economy. AIM stimulates economic activity around an array of selected innovative clusters: creative industry, ICT, life sciences, sustainability, and trade and logistics.

Kenniskring Amsterdam: The Kenniskring is a networking organization consisting of representatives from industry, education and science, and local government. The Kenniskring Amsterdam (KKA) aims to stimulate knowledge transfer, strengthening and expanding the regional knowledge infrastructure, and stimulating and initiating new ideas and cooperative clusters. The Kenniskring is the broadest and most important innovation network of the Amsterdam metropolitan region. It is of vital importance in establishing personal ties across industry, education and government sector. It helps to isolate shared strategic objectives, but the follow-up on these issues is subsequently left to the initiative of the members themselves. If coalitions arise from the Kenniskring, they are thus formed in a bottom-up manner.

Amsterdam Topstad: Amsterdam Topstad is a programme initiated by the municipality of Amsterdam to strengthen the regional economy and improve the international settlement climate of Amsterdam. The Amsterdam Topstad programme is based on eight goals: 'optimally facilitate expats', 'building an open and hospitable city', 'developing top education: Harvard on the Amstel', 'facilitate creative talents, career makers and cross-overs', 'optimalize ICT infrastructure, content and applications', 'stimulate knowledge valorization and businesses in the life sciences', 'Amsterdam as a sustainable city', 'profiling Amsterdam as an event city and conducting city marketing'. Together with regional partners Amsterdam Topstad employs initiatives that further these aims, such as the opening of an 'Expat Center' to facilitate expats in Amsterdam. Around 100 local and regional governments, HEIs and businesses participate in the

Amsterdam Topstad programme.

Creative Cities Amsterdam Area: Creative Cities Amsterdam Area (CCAA) is a programme initiated in 2007 by national and local government, two Chambers of Commerce, and seven development associations. CCAA stimulates the creative industry in seven cities in the Amsterdam metropolitan region (Almere, Amsterdam, Zaanstad, Utrecht, Amersfoort, Hilversum and Haarlem). It is targeted at the following three creative industries: arts, media and entertainment, and creative professional services. CCAA offers national and international companies access to the creative potential of the region. Conversely, it also helps the region's creative companies find the right facilities to stimulate their entrepreneurialism. The programme does this through three key activities:

- Concentrating information and activities, by bringing them together in a single physical and digital location (www.creativeamsterdam.nl);
- Facilitating, by improving services to foreign companies and to start-ups and growth companies;
- Promoting the creative industries in the region to attract national and international attention.

Life Sciences Center Amsterdam: The Life Sciences Center Amsterdam (LSCA) is an initiative in which the TTOs of multiple life sciences centers work together on knowledge valorization. LSCA has been established on initiative of Amsterdam Topstad and AIM by the following Amsterdam based knowledge institutions:

- UvA/AMC;
- VU/VUmc;
- Netherlands Cancer Institute (NKI);
- Sanquin.

LSCA functions as an intermediary between these organizations and private parties who are interested in licensing new life science technologies.

iMMovator Cross Media Network: Networking organization aimed at strengthening the cross-media sector with an emphasis on innovation and economic return. Cross-media means the continuing integration of radio, television, internet, mobile technology, print and events. Immovator Hilversum focuses on the cross-media industry in the Amsterdam metropolitan region. Participants in this networking organization are local governments, chambers of commerce, media companies, the Rabobank, Atos Origin, Syntens and several HEIs.

Almere Kennisstad: Almere Kennisstad is a programme that aims to contribute to the economic and social development of Almere by using ICT in several sectors of society. Almere Kennisstad also wants to strengthen the position of Almere in the Netherlands and that of the wider Amsterdam metropolitan region. It supports several projects related to the following themes: building and living, economy, mobility and security, education and research, and care and wellbeing. It furthermore organizes workshops, seminars and conferences.

Source: MinEZ (2009b), Syntens (2009), KVK (2009), AIM (2009a), KKA (2009), Amsterdam Topstad (2009), CCAA (2009), Immovator (2009), Almere Kennisstad (2009), TechnoPartner (2009)

Cooperation starts by organizing stakeholders and drawing up a joint vision or strategy for promoting innovation. In the Amsterdam region several joint efforts were established to answer the important question: what direction should innovation take and how should the region promote this goal? The Regional Innovation Strategy (RIS) of the Chamber of Commerce is widely

supported by the local stakeholders and hence forms an important stepping stone to obtain regional commitment for innovation. The RIS aims to create the right breeding ground for innovative companies and people, in particular by strengthening the cooperation within the metropolitan region between regional and local governments, industry and knowledge institutions (ibid: 5). Following the philosophy of the *Pieken in de Delta* agenda of the central government, RIS denotes a number of clusters and themes in which the Amsterdam metropolitan region is considered to have a competitive advantage.

3.5 Key clusters of economic activity according to RIS

3.5.1 ICT and the creative industry

Information and Communication Technology (ICT) and the creative industry together form a cluster because of their overlap and complementary characteristics. ICT is considered the driving force behind the development of new concepts and products in the field of new media, professional services and logistics, and which reaches all companies, institutions and consumers. Amsterdam currently has the largest internet hub of the world: the AMS-IX. The creative industry is another sector of crucial importance to the Amsterdam metropolitan region. The RIS mainly focuses on the following domains of this cluster:

- Media and entertainment industry (broadcasting, radio and television, publishing, gaming, movies, music, etc.);
- Creative professional services industry (marketing companies, design, fashion, architecture, etc.).

After the life sciences cluster the creative industry is probably the best organized sector in the Amsterdam metropolitan region. Creative Cities Amsterdam Area (CCAA) functions as the umbrella organization for this cluster. CCAA was initiated in 2007 by the *Amsterdamse Innovatiemotor* (AIM) with a pledge by the region's local government and other organizations to cooperate. It wants to be a 'one-stop shop' for the creative industries and facilitates entrepreneurs in various ways (see Box 3-1).

3.5.2 Trade and logistics

The Amsterdam metropolitan area is a global hub for air, road, water, rail and information transport and takes a key position in the international financial and professional services. Furthermore, the metropolitan region acts as an inter-cultural gateway between European, Atlantic and Asian trade blocks. Recently, the branch organizations, companies, knowledge institutions, the Netherlands Chamber of Commerce and governments established the coalition '*The Smart Cargo Hub for Europe'*. This coalition aims to turn the Amsterdam region into the best, smartest, and most reliable logistic multimodal European hub. Amongst its objectives is the ambition to improve the knowledge transfer between HEIs and industry:

- RIS aims to strengthen first class research and first class education in the field of trade. One of the initiatives taken is the establishment of a Research Network for International Economics, Logistics and Technology (RELATE). This organization would have to act as an intermediary between universities and industry in order to better streamline knowledge transfer between the two. There will also be close cooperation between HEIs in Amsterdam and the new to build Top Institute Logistics and Supply Chain Campus in Breda.
- Another objective is to improve the connection between vocational education and the logistic industry: this is taking shape in the project Knowledge Bridge (*Kennisbrug*).

3.5.3 Life Sciences

Given the high likelihood of great scientific and economic breakthroughs in the field of life science, RIS has designated this cluster as having great future potential for the Amsterdam metropolitan region. This potential is further enhanced by the presence of world class knowledge institutions in the Amsterdam region, as well as the favorable framework conditions that are offered by the region (such as ICT-infrastructure and airport Schiphol). In addition, there are profitable opportunities for cross-fertilization with other disciplines, such as ICT. The ambition of a strong life science cluster is being put into practice by a collaborative body of companies, knowledge institutions and governments: the Amsterdam BioMed Cluster. The BioMed Cluster is probably the most organized cluster in the Amsterdam metropolitan region. It has reached considerable focus and mass to have a significant impact on the region. The Life Sciences Center functions as a gateway to innovative technologies from UvA/AMC, VU/VUmc, Netherlands Cancer Institute (NKI) and Sanquin. Moreover, there is a Life Sciences Fund which provides investment capital to fund biomedical entrepreneurial activity in the province Noord-Holland. The BioMed cluster also hosts a whole array of other information and support initiatives to facilitate entrepreneurs in the life sciences (see www.amsterdambiomed.nl). Initially the organization of the BioMed Cluster was taken on by the Amsterdam Chamber of Commerce with the help of knowledge institutes and a selected group of life sciences companies, such as Avantium and Agendia. In 2006, the *Amsterdamse Innovatiemotor* (AIM) took over.

3.5.4 Sustainability

The Amsterdam metropolitan area has a number of internationally renowned companies, knowledge institutions and NGOs which develop and market products and services in the field of sustainable development. Moreover, sustainability is an overarching concept that also involves the implementation of innovative techniques in other sectors; in this respect, ICT plays a key role in the effort to find sustainable solutions. On the other hand, the RIS recognizes that sustainability is a cluster in development. It still has to find shape in terms of content and organization. One tangible initiative in this cluster is the realization of a knowledge center and 'incubator' for starting companies in relation to sustainability on the Northern shores of the IJ-river. This initiative is called New Energy Docks, Amsterdam Centre for Sustainable Solutions (formerly *Kennisoever Duurzaamheid Amsterdam-Noord*). Partners in New Energy Docks are VU, UvA, Shell, ING, AIM, Kenniskring Amsterdam and the municipality of Amsterdam.

Another initiative related to sustainability is the project *Amsterdam Smart City*, a cooperation between citizens from Amsterdam, companies and local governments aimed at saving energy. By means of a combination of innovative technology, changing behavioral patterns and sustainable economic investments Amsterdam Smart City aims to develop small-scale initiatives that help to improve environmental quality in and around Amsterdam. The idea is to test the initiatives on a local scale first before they can be implemented on a nation-wide scale. Eventually the aim is to reduce CO2 emissions to the targets stated on a European, national and local (Amsterdam) level. For Amsterdam this implies a 40% reduction in CO2 emissions.

The Amsterdam metropolitan region is likewise assembling a regional strategy for innovation through the platform for regional economic structure (PRES). The local communities forming this platform aim to develop the Metropolitan area into a 'global business gateway'. They recognize the need for a joint initiative to sustain the competitive advantage of the region as a major business and industry hub in the face of mounting global competition. PRES formulates the ambition to develop the Amsterdam metropolitan area into one of the 6 largest global business

gateways in the world. Like the RIS, PRES tries to achieve this aim by identifying specific key economic sectors, which are said to be of vital importance for the international competitiveness of the metropolitan area. By and large, these sector match the RIS-listing, although there are some notable differences. The key economic sectors of PRES are:

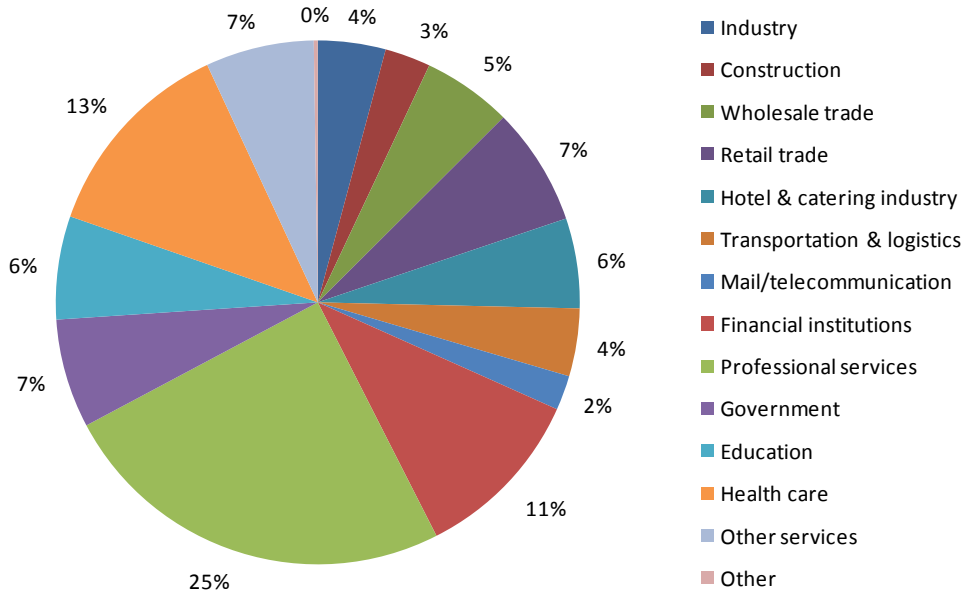
- Financial and the other business services
- ICT and the creative industry;
- Logistics;
- Knowledge-intensive industry and services (flowers, food, fish and life sciences are mentioned);
- Tourism and international fairs.

Finally, the city community is momentarily identifying key economic drivers for a 'Strategic Agenda for the Economic Domain' (SEA). This agenda adopts a different approach from the aforementioned agenda and seeks to strengthen the structural economic drivers of competitive power such as the knowledge base, human capital and entrepreneurship rather than specific economic sectors. It is therefore much more focused on creating the right conditions for innovation to emerge, rather than identifying in a top-down manner where such innovations should emerge. SEA underlines that any type of innovative activity deserves support, not only those in tightly defined clusters, possibly to the detriment of many other promising developments.

3.5.5 The importance of innovative clusters for the local economy

An overview of the importance of several sectors in the Amsterdam economy is given in Figure 3-4. The sectors which according to the RIS are of strategic importance for the Amsterdam metropolitan region – ICT and creative industry, trade and logistics, life sciences, and sustainability – are except for sustainability explicitly (trade and logistics) or implicitly (ICT and creative industry and life sciences) included in the figure. Trade and logistics accounts for 16% of total employment in Amsterdam. ICT and creative industry are part of the telecommunication (6%) and professional services (25%) clusters. The life sciences cluster is part of the medical sector (13%). Only sustainability is an overarching cluster for which no data are available.

Figure 3-4: Employment in Amsterdam by sector



Source: Statistics Netherlands Statline (2008f)

3.5.5.1 ICT and creative industry

Creative industry is an all-encompassing concept for businesses and institutions which deliver products and services with a cultural and/or symbolic meaning. Within the creative industry three sectors can be distinguished:

- Arts (stage arts, museums, galleries);
- Media and entertainment (publishers, radio and television);
- Creative professional services (marketing, design, fashion).

In the Amsterdam metropolitan region, the creative cluster takes a dominant position in the local economy both in number of jobs and number of business branches. With 34,482 jobs, 7.0% of the employment in the municipality of Amsterdam is in the creative industry. Moreover, 14.5% of all business branches in Amsterdam belongs to the creative sector. The creative industry is also a fast growing sector in the Amsterdam economy. The number of start-ups in the creative sector increased by 64% from 2007 to 2008. Moreover, the creative sector accounts for 4.0% of total added value in Amsterdam. When looking at the larger metropolitan region, this cluster is equally important. One out of three jobs in the creative sector in the Netherlands is located in the Amsterdam metropolitan area. Employment in this sector is mainly concentrated around Amsterdam, Hilversum, Aalsmeer, Laren and Muiden. Hilversum is important since all the important radio and television production companies are located there. 3% of the total value added in the Amsterdam metropolitan region is generated in the creative industry.

Table 3-1: Jobs, added value and branches of the creative industry in the Amsterdam metropolitan region

	Number of jobs (2007)	Added value (EUR million) (2006)	Number of branches (2007)	Jobs per branch (2007)
Arts	10,485	355	3,005	3.5
Media and entertainment	12,815	563	3,579	3.6
Creative professional services	11,182	321	3,930	2.8
Total creative industry	34,482	1,240	10,514	3.3
Total Amsterdam	491,778	31,474	72,413	6.8

Source: O+S Amsterdam (2009), O+S Amsterdam (2008b)

Compared to the creative industry, the ICT sector provides for even more employment (Table 3-2). In 2008 a total of 41,887 people were working in the ICT sector, 9.7% of total employment in Amsterdam. Moreover, 14% of all business branches in Amsterdam is in this sector. After the booming second half of the 1990s, the growth rate in the ICT sector plummeted as the dotcom bubble burst. Over the period 2004-07 employment growth was 7.4%. From 2008 to 2009, however, employment in the ICT sector expanded again, by almost 10%, more than in the three preceding years combined.

Table 3-2: Number of business branches and employment in the ICT sector in Amsterdam

	2004	2005	2006	2007	2008
Number of branches					
Content	5,105	5,208	5,347	5,483	5,995
Services	2,676	2,664	2,831	2,901	3,249
Hardware	286	302	340	331	331
Total ICT sector	8,067	8,174	8,518	8,715	9,575
Total Amsterdam	57,652	58,227	59,784	59,837	64,015
Number of jobs					
Content	17,444	17,029	16,765	17,714	18,798
Services	18,408	17,528	17,333	17,896	17,791
Hardware	4,206	4,793	5,010	5,387	5,298
Total ICT sector	40,058	39,350	39,108	40,997	41,887
Total Amsterdam	410,264	410,338	414,386	423,241	432,338

O+S Amsterdam (2008b), O+S Amsterdam (2008c)

3.5.5.2 Trade and logistics

In 2008 the trade and logistics cluster accounted for 16% of total employment in Amsterdam. Table 3-3 shows how the number of jobs in this sector have developed over the last couple of

years. Employment in the trade and logistics sector has remained virtually stable over the period 2004-08 and has even declined in 2005 and 2007. In 2008 approximately 73,512 people were working in this sector. The performance of trade and logistics as a sector is strongly correlated with the business cycle. Although employment increased from 2007 to 2008, the prospects for 2009 are worse due to the worldwide financial crisis. Added value has increased with 22.5% from 2004 to 2005. The driving forces behind the sector in Amsterdam are airport Schiphol and the Amsterdam harbor. Schiphol is the 12th largest airport in the world and the 7th largest in Western Europe in terms of passenger travel (Airports Council International, 2008). In 2008 Schiphol airport experienced a total passenger flow of 47.4 million passengers (Schiphol Group, 2009). In 2007 it accounted for 58,897 jobs (O+S Amsterdam, 2008e: 380). The harbor of Amsterdam is the second-largest (after Rotterdam) of the Netherlands and the 4th port of Europe. In 2007 it had a throughput of 85 million tons of goods (Port of Amsterdam, 2007).

Table 3-3: Employment and added value of the trade and logistics sector in Amsterdam

	2004	2005	2006	2007	2008
Number of jobs					
Wholesale trade	23,847	24,801	24,152	23,434	23,914
Retail trade	31,320	30,938	30,861	30,931	31,527
Transportation and logistics	18,448	17,090	18,622	18,120	18,071
Total trade and logistics sector	73,615	72,829	73,635	72,485	73,512
Added value (EUR million)					
Wholesale trade	2,810	3,077			
Retail trade	1,136	1,108			
Transportation and logistics	1,077	1,966			
Total trade and logistics sector	5,023	6,151			

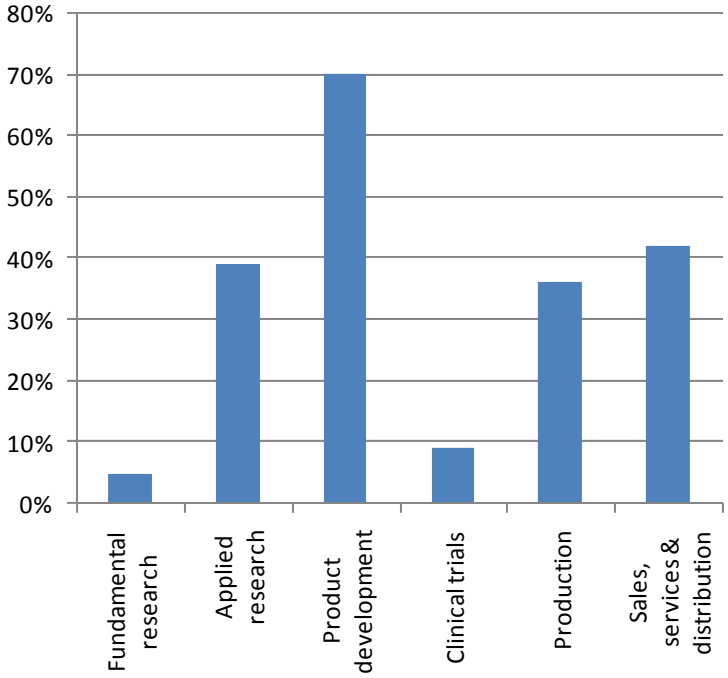
Source: O+S Amsterdam (2008d), Statistics Netherlands Statline (2006e)

3.5.5.3 Life sciences

Life sciences is a relatively new line of business. The precise size and composition of this cluster is unknown (O+S Amsterdam, 2008e: 367). The life sciences sector revolves around technology and processes which use living organisms, such as bacteria, viruses or plants, or particular forms of biological life, such as enzymes or DNA, to perform research on or develop new products like medicine, genetically modified corn or improved production processes. One unique characteristic of this sector is the close relationship between scientific research and the development and translation of this research to practical applications. The life sciences sector has three types of companies: knowledge intensive companies specialized in biotechnology (dedicated), companies that use life sciences technology in their existing activities (diversified), and companies that use life sciences knowledge developed elsewhere. The life sciences cluster is particularly well-developed in the field of health care, which is attributable to the two universities, two academic

hospitals and several specialized research institutions in the region. The Amsterdam metropolitan region has the largest concentration of BioMedical research in the Netherlands (AIM, 2009: 57).

Figure 3-5: Type of activities at BioMedical companies in the Amsterdam metropolitan region



Source: AIM (2009b)

In the Amsterdam metropolitan region 6,700 researchers at knowledge institutions are working in the life sciences field (ibid: 57). Another 6,000 researchers are working for companies specialized in biotechnology. The Amsterdamse Innovatiemotor (AIM) estimates that for every job in the life sciences approximately one extra job is generated at supplying, supporting or buying companies. Following this, there might be around 25,000 people working in the life sciences sector in the Amsterdam metropolitan region.

3.5.5.4 Sustainability

Although sustainability is a hot topic nowadays, as a cluster it is hard to quantify given that sustainability is an overarching concept that also involves the implementation of innovative techniques in other sectors. Nevertheless, an essential part of this cluster is formed by the energy- and environmental technology sector. In the Amsterdam region, about 13,000 people are working in this sector, for instance at large companies such as Shell or Nuon (ibid: 71).

3.5.6 Innovation output in the Amsterdam region

Indicators of the innovative strength of regions in the Netherlands or the innovative output are scarce. Table 3-4 presents some figures on the employment in the medium and high-tech industry and the high-tech services sector in the province of Noord-Holland (of which the Amsterdam metropolitan region is a part) and the Netherlands as a whole. Over the last couple of years employment in Noord-Holland in the medium and high-tech industry and high-tech services has been significantly lower than the Dutch average, roughly half of it. However, employment in the high-tech industry more or less equals that of the Netherlands as a whole. It also appears from the table that the share of medium and high-tech industry and high-tech industry in the total

employment has no upward or downward trend, but fluctuates roughly around 1.8% (medium and high-tech industry) and 4% (high-tech services) over the last couple of years.

Table 3-4: Employment in the medium and high-tech industry in the province Noord-Holland (NH) and the Netherlands (NL)

	2002		2003		2004		2005		2006	
	NH	**NL**	**NH**	**NL**	**NH**	**NL**	**NH**	**NL**	**NH**	**NL**
Employment in medium and high-tech industry (% of total employment)	1.9	4.1	2.2	4	1.9	3.6	1.7	3.3	1.6	3.1
Employment in high-tech services (% of total employment)	3.9	3.7	4.5	3.9	4.2	4	4.3	4.1	4.1	3.8

[1] European Patent Office
Source: Statistics Netherlands Statline (2005b)

Table 3-5 gives a more direct measure of innovative output in the province of Noord-Holland. It presents the patent applications to the European Patent Office (EPO) for three disciplines: biotechnology, ICT and nanotechnology. ICT is clearly the strongest sector in terms of patent applications, which corresponds with the assertion that the ICT sector is one of the sectors in which the Amsterdam region has a competitive advantage. Biotechnology is the second strongest sector, whereas the nanotechnology cluster is still in the stage of infancy. The number of patent applications varies considerably over the years and has declined in all sectors between 2004 and 2005. The share of Noord-Holland in the total number of Dutch patent applications to EPO roughly varies between 6 and 9% over the period 2001-05. This share can be considered when measured against the economic importance of the province, given the fact that 18.2% of the GDP is earned there (Statistics Netherlands Statline, 2006a).

Table 3-5: Patent applications in Noord-Holland to the European Patent Office (EPO) by technology

	2001	2002	2003	2004	2005
Biotechnology	16.2	27.5	24.6	34.3	25.0
ICT	58.1	57.7	42.4	57.1	45.3
Nanotechnology	0.6	0.6	1.8	0.7	0.4
Share of region in country's total patens	6.4%	8.0%	7.9%	9.3%	7.7%
Total patents	245.9	277.0	271.1	329.3	258.7

Source: OECD (2006)

3.6 Responding to regional needs and demands

The Amsterdam metropolitan region has four major HEIs: the University of Amsterdam (UvA), the VU University Amsterdam (VU), the Hogeschool van Amsterdam (HvA) and Hogeschool INHolland. Together these four HEIs have a student population of over 100,000 and they employ

more than 10,000 people (in fte). They are also multi-sector HEIs, with education and research being conducted in all key disciplines: humanities, the social/behavioral sciences, economics/business, law, the natural sciences and medicine. In its academic profile, the UvA presents itself as an inspiring, broadly-oriented international academic environment, which is open-minded and strongly engaged with society. The VU has included in its mission the aim for high quality, fundamental, innovative and socially oriented research. The two universities of applied sciences, HvA and INHolland, both emphasize their aim to provide practice-related education, to ensure that their students are educated in correspondence to what the labor market demands. They also underscore their cooperation with employers in the region.

The research curriculum of UvA is influenced by strengths and characteristics of the region. While research at UvA has a broad orientation, it also has a degree of specialization and focus in research programmes in which the university has a strong international reputation and for which external funds can be attracted and/or which make a substantial contribution to the transfer of knowledge to society (valorization). Especially the latter part has a strong regional dimension. A number of research initiatives and programmes benefit from particular characteristics and strengths of the Amsterdam city. Examples are the Netherlands Institute for System Biology, the research programme *Urban Studies: Global Flows, Local Environment, Organized Diversity, and Governance*, and the Amsterdam Centre for Service Innovation (AMSI), which conducts research and provides education in the field of innovation in the services sector. The research curriculum of VU has not been constructed with explicit reference to strengths or characteristics of the region, although the university underscores that there is a clear interaction between the region and the particular content of research programmes. The VU has particularly strong ties with firms on the Zuidas business district, of which also the VU is a part. For instance, there is a strong link between research conducted in the economics and law faculties and the professional and financial services sector located on the Zuidas. The interconnectedness of the VU with Zuidas businesses provides a unique environment for open innovation and is a prerequisite for the international competitiveness of the Zuidas. A number of research initiatives strongly reflect this interaction, such as the Duisenberg School of Finance (DSF), the Zuidas Law Academy, and the Zuidas master programme *entrepreneurial law*. Furthermore, the city of Amsterdam frequently consults the VU to promote attention for topics related to public governance and urban studies, as well as to the clusters in which Amsterdam is considered to have a competitive advantage: trade and logistics (airport Schiphol and the Amsterdam harbor), life sciences, and ICT and creative industry.

In developing its educational and research portfolio the HvA has taken the regional characteristics more explicitly into account than UvA and VU. Educational programmes and research initiatives are often based on topics from the municipality's social strategic agenda 2004-2015, a policy action document grounded on a number of themes of Amsterdam city life, such as the working city, cultural city, sporting city, caring city and safe city. Examples of research initiatives and programmes in recent years are internships for students at the Directorate of Justice of the municipality of Amsterdam, the City Academy (*Academie van de Stad*), the research programme *Mantelzorgers in Amsterdam* (research into care and voluntary help), research institution *De Karthuizer*, and the project *Krachtwijken*. INHolland has founded its educational and research portfolio on a number of key pillars, which are: societal engagement, social responsibility, high quality education, diversity and internationalization. Entrepreneurship plays a key role in education and research at INHolland. In all departments of INHolland, so-called 'working field commissions' (*beroepenveldcommissies*) (for a large part made up by representatives from businesses) have been appointed to promote entrepreneurship. In connection to this, INHolland has recently decided to combine its education and research efforts (currently scattered across 16 departments) into six or seven key focus areas. The aim is to create synergy through cooperation

and more efficient exploitation of resources. Based on its strategic focus areas, INHolland has started a number of projects that draw upon the characteristics of the region to develop research activity. For instance, in the focus area 'sustainability' INHolland works together with the city of Amsterdam, the province of Noord-Holland and regional companies. Furthermore, the theme 'city marketing' has received a boost from the recent *I AMsterdam* marketing campaign of the city of Amsterdam. More generally, INHolland stresses that it benefits a great deal from the social/demographic and economic map, the existing networks and the active stakeholders of the Amsterdam metropolitan region.

Box 3-2: Responding to regional needs and demands

Netherlands Institute for System Biology
HEIs and research institutions in Amsterdam have much knowledge that can contribute to *system biology*, a swiftly developing paradigm within the life sciences discipline. For this reason the VU University Amsterdam has initiated the Netherlands Research Institute for System Biology (NISB). Other partners in this institute are the University of Amsterdam, FOM Institute for Atomic and Molecular Physics, and the National Research Institute for Mathematics and Computer Science. Formally launched in 2007, the NISB aims to coordinate and share research efforts, knowledge, and grant applications on behalf of its partners, and systems biology at large.

Duisenberg School of Finance
Given the strong financial services sector in Amsterdam, the Dutch financial sector together with several Dutch research universities have decided to create the Duisenberg School of Finance (DSF), with the aim to establish a number of high profile programmes in finance at the MSc, MPhil, and PhD level. The founding partners of DSF are ING, Aegon, Fortis, APG, NYSE Euronext, SNS Reaal, the Dutch Central Bank, as well as the following academic institutions: UvA, VU, Tilburg University, Erasmus University Rotterdam and the Tinbergen Institute. The regional significance of DSF is that two regional universities, which have quite a different profile and a history of competition, have acknowledged their mutual interest and decided to work together in this initiative.

De Karthuizer
De Karthuizer is a practical and research center established by the Hogeschool van Amsterdam. Its purpose is to provide occupational training for students at HvA within educational programmes related to social sciences and law. At De Karthuizer, students work together with Amsterdam residents and professionals to solve practical social questions which arise in the urban environment. De Karthuizer frequently works in cooperation with the municipality of Amsterdam, for instance in the research programme *Mantelzorgers in Amsterdam*.

Source: NISB (2009), DSF (2009), De Karthuizer (2009)

A number of research initiatives undertaken by the HEIs in Amsterdam are executed in cooperation with regional partners. The UvA works together with HEIs, the municipality, companies and the non-profit sector. In general, researchers at UvA establish and maintain their own contacts with partners, for instance through personal networks and conferences. The Technology Transfer Office of UvA and AMC plays a crucial role in assisting university researchers to set up contacts with external organizations (see more on TTOs below). The VU also works together with HEIs (especially the UvA), the municipality, companies and the non-profit sector. Both research universities work together in a large number of initiatives (also see Annex E). The municipality and other governments in the region are regularly involved with research at the VU, either as contractor or object of study. This takes place mainly in the field of

social and economic sciences. Because the VU aims to be a university with a responsible social role, the research conducted there often focuses on social matters. This is for example true for the research at VU university medical center (VUmc), such as the initiative *De Gezonde Wijk* (health and sports in an urban environment) and research into aging and obesity. The results of research conducted at VUmc are shared with regional stakeholders, particularly health organization GGD. The department of social sciences cooperates with local health organizations in the context of youth care. The departments of economics and law are in partnerships with for instance airport Schiphol, IBM and several regional banks, law firms and municipal courts. A final type of cooperation with regional partners follows from extraordinary professors (*bijzonder hoogleraren*). The research links maintained by UvA and VU have been established through three main channels:

- Researchers' personal networks;
- Cooperation in a subsidized research programme (NICIS institute, Pieken in the Delta, and the European Fund for Regional Development);
- Through contract research.

The nature of cooperation with regional partners depends on the specific form of the research venture. In case of contract research, the organization and communication with the contractor follows clear guidelines. However, if the research depends on the help of a regional partner which has not commissioned the research, the partnership might be based solely on information exchange. The VU distinguishes between two types of cooperation: contract research and personal partnerships in the form of part-time professorships or dual PhD's (a PhD tenure combined with a regular job). The HvA has research links with knowledge institutions, companies, social institutions and government. Contrary to the UvA and VU, cooperation with the business sector is mainly directed towards SMEs, whereas the research universities maintain relatively strong links with large companies and multinationals. HvA's cooperative partnerships often take place through its lectors (*lectoraten*), which act as an intermediary between the HvA on one side and companies and/or public sector organizations on the other side. The links with external parties are established and managed by the board, lectors and teachers. INHolland also works together with a large number of regional partners in developing research activity. The health department maintains strong links with the EMGO institute of VU/VUmc. Through the Platform Arbeidsmarkt en Onderwijs (PAO), INHolland is also participating in the Health Alliance. The department of education & learning cooperates together with the VU in the AZIRE (research in education) project. INHolland has also cooperated with Syntens and the iMMovator Cross Media Network, organizations that have provided financial support to INHolland in setting up learning-working-companies (*leerwerkbedrijven*) in the creative industry. An exhaustive list of regional contacts of the several research programmes at UvA, VU and HvA is provided in Annex E.

3.6.1.1 The role for the Knowledge Transfer Offices

UvA/AMC, VU/VUmc and INHolland have their own TTOs which play an important role in joining the regional needs and demand for knowledge. We shall elaborate further on in more detail on their functioning. At this stage it is important to stress that the role for the two TTOs is not strictly regional. Their working field extends to national and international ventures. This applies in particular to the UvA/AMC-TTO due to its link with the Science park Amsterdam.

3.6.1.2 Attracting international business partners

The mechanism through which UvA links local companies and other employers with international partners are research projects in which both local and international partners collaborate. This

mostly happens in the context of R&D projects that are sponsored by the European Commission, the KP7 programmes. UvA currently runs approximately 100 programmes that are financed with European funds. In a number of cases the UvA works together with regional partners as well as international partners. These regional and international partners can be HEIs, companies or governments. However, apart from these *ad hoc* collaborations the UvA has no separate mechanism to link local companies and other employers with international partners. The UvA has no policy to establish relationships between regional HEIs, companies or governments and partners other than the UvA, AMC or HvA. The VU also indicates that there is hardly any mechanism in place to link local companies and other employers with international partners apart from the research ventures that are financed with European funds. One exception is that the TTOs of UvA/AMC and VU/VUmc invite foreign pharmaceutical companies to visit the Amsterdam BioMed Cluster and to meet local companies from this cluster. In this way the UvA/AMC and VU/VUmc hope to interest these foreign companies to cooperate with local businesses in the field of R&D. The HvA has indicated that it has no mechanisms of any sort that are aimed at linking local companies and other employers with international partners.

3.6.1.3 Mechanisms to connect needs and demands

The HEIs have several provisions to meet specific regional technology and innovations needs and demands, such as those from SMEs. The two research universities UvA and VU work together with HvA and INHolland in an initiative called www.kennispoortamsterdam.nl, a website which functions as a portal for research questions which can be filed by SMEs. These are then forwarded to the most appropriate HEI in the Amsterdam region. This can be either UvA, VU, HvA or INHolland. The HEI on its turn will ask its researchers or students to answer the research question. SMEs can for instance use knowledge vouchers to pay for the consultancy/research efforts of the HEI. The website is an initiative of the Kenniskring Amsterdam, Syntens and VNO-NCW West, and MKB Netherlands. It was set up in order to improve knowledge valorization in the Amsterdam region as well as to strengthen the links between knowledge institutions and the business sector. Another initiative in which the four HEIs collaborate is the Center of Amsterdam Schools for Entrepreneurship (CASE), a programme aimed at improving education in the field of entrepreneurship at UAS and research universities in Amsterdam (CASE, 2009). CASE also organizes networking meetings, summer schools and workshops for students with their own business. Other participants in the CASE programme are KVK Amsterdam, Amsterdam Topstad (the municipality), Kenniskring Amsterdam and MKB Netherlands. HvA and INHolland also use their lectors as a portal through whom SMEs can communicate their technology and innovation needs and demands. Lectors often direct their research activities towards the needs and demands of SMEs and also involve SMEs in their research activities. Subsidies to support these innovation-related partnerships between lectors and SMEs is available through Syntens and the InnovatieAlliantie foundation, which provide funds via RAAK-programmes (see § 2.2.2). INHolland has divided its thirty lectorates in six different Research and Innovation Centers. Within these centers knowledge networks and INHolland work together in research projects on the themes Business and Technology, Education and Learning, Entrepreneurship, Global City, Governance and Quality of Life. INHolland furthermore connects regional needs and demands through Netwerk023, which is a network for companies in the media, advertising and internet sector. This network is directed towards the Haarlem region. Network023 aims to support cooperative ventures between companies and students in the creative industry. INHolland also has networking sessions with TNO, a Dutch institute of applied research (mainly beta-research) to set up innovative projects together.

3.6.1.4 Incentives for regionally-based research

There are no specific reward schemes for regionally-based research other than the usual incentives to engage in contract research, which often includes commissions from regionally based governmental organizations and corporations. UvA and VU reward regionally-based research through their basic funding mechanisms, provided this research meets the criteria set out by their strategic research agenda's. Concerning this role, it should be noted that UvA explicitly acknowledges regional engagement and its role as a university in the city as part of its mission statement and has done so for over twenty years.

HvA and INHolland stimulate their lectors and other researchers to apply for subsidies available through the RAAK-programme. These subsidies are specifically intended for regional knowledge exchange between knowledge institutions, on the one hand, and SMEs and public institutions on the other hand. For the Foundation Innovation Alliance the RAAK-programmes are successful when a project leads to an application of knowledge in the SME sector. INHolland furthermore thinks that its redirection of research away from separate departments towards discipline-oriented research might have contributed to a stronger regional engagement.

3.7 Interfaces facilitating knowledge exploitation and exchange

3.7.1 The role of the university TTOs

The commercialization of the research base of the research universities UvA and VU is being promoted by their TTOs. These two offices are linked through IAMstarter, an organization which receives support from the Technopartner programme of the Ministry of Economic Affairs. The intermediary role for IAMStarter emerged as a condition for receiving an SKE-grant from the Ministry, which did not want to subsidize competing programs in the same region and demanded a form of collaboration. IAMStarter also represents the local business community in the form of an advisory board. The participants in this board are listed in Annex F.

Both the VU-TTO the Knowledge Transfer Office of UvA (*Bureau Kennistransfer* or BKT) see their mission in a broad social and economic context. Generally spoken they aim to open up access to scientific knowledge and technology for social purposes. This includes the application of knowledge in commercial and social developments. With regard to the role of the TTOs towards VUmc and AMC patient well being is an explicit aim. Inward the role of the TTOs is to stimulate a professional and commercial access to scientific knowledge developed at the universities. Also the TTOs actively scout for promising projects and supply services for the application of subsidies or the filing of intellectual property rights (patents). Depending on the nature of the case, the TTOs also actively support the formation of spin-off companies as a vehicle for valorization. The external role is to build coalitions for the application and commercial exploitation of knowledge. This aids a final goal, which is the promotion of employment and economic growth in the region and beyond.

VU-TTO was established with a budget of EUR 5,1 million for a four year period (2006-2010). EUR 2,5 million of this budget was financed by the SKE subsidy from the Ministry of Economic Affairs. The remaining EUR 2,6 million was matched by both VU and VUmc. VU-TTO offers three types of incentives to stimulate the transfer and valorization of knowledge:

- A fund for the filing of patents: budget EUR 1 million.
- A preseed fund of EUR 1,7 million for investment and preseed loans.
- An 'inventors' regulation for filing and exploiting intellectual property rights: the scientists involved are allowed a share of 1/3 of the proceeds from licenses and other

income related to IP rights. The faculty is also entitled to a share of 1/3 and the remaining part is added to university resources.

Since 2008 the UvA has its own TTO jointly with AMC called the Knowledge Transfer Office (*Bureau Kennistransfer* or BKT). It was set up to stimulate knowledge transfer and provide optimal support to scientists in the transfer process. BKT assists researchers at UvA and its medical center AMC in applying for research and educational subsidies, and provides information about contract research, business development and licenses. BKT has two branches: one for the UvA/AMC, HvA and all institutes of the Netherlands Organization of Scientific Research (NWO) located on the Science Park Amsterdam, and the other for the AMC medical center on AMC premises. BKT has a regional role in the sense that it acts as the intermediary between researchers and external parties in the Amsterdam region such as other research institutions, companies, non-profit organizations and government. On a national and international scale BKT not only acts as an intermediary for knowledge transfer, but also provides knowledge about subsidy applications for funds such as from the Technology Foundation (STW) and the European Commissions' *Seventh Framework Programme* (FP7). These funding bodies on their turn often require cooperation with commercial organizations, which increases the number of partnerships. Finally, BKT participates in several regional innovation organizations such as Kenniskring Amsterdam, Life Science Centre Amsterdam and Subsidieregeling Kennis Exploitatie (SKE).

The HvA does not have its own TTO, but its employees use the services of the UvA's BKT. The BKT offers a broad package of services to researchers and other employees at HvA. Furthermore, government institutions and commercial organizations can contact the BKT to develop scientific underpinning of their theoretical idea.

INHolland has a so-called SME-office (*MKB-loket*) that is a cooperative partnership between SMEs and the several branches of INHolland across the Netherlands. The SME-office is a portal for SMEs to knowledge at INHolland and stimulates, initiates and coordinates internship and graduation assignments, internships for lecturers and company visits, customer-tailored education, etc.

3.7.2 Results of the TTOs

The two Amsterdam TTOs have been functioning for just a limited number of years. For this brief period it is difficult to list results. For the VU/VUmc TTO it is known that the number of patents filed has increased from 10 in 2006 to 23 in 2008. IP-License/deals have decreased from 18 in 2006 to 5 in 2008. In 2006 the VU/VUmc TTO produced 2 fully operating and 7 starting-up spin-off companies. In 2008 it was responsible for 3 fully operating and 6 starting-up spin-off companies.

3.7.3 Other mechanisms to commercialize the knowledge base

The commercialization of the university research base also takes place in a number of other ways. Firstly, through research contracts, collaboration with regional partners and consultancy. This mechanism is being used both at UvA and VU. The UvA specifically aims to work together with regional partners, for instance in the Life Science Centre Amsterdam and a consortium initiated from SKE in which knowledge institutions and local government cooperate. This cooperation results in for instance the availability of commercial coaching against reduced tariffs, close collaboration with patent bureaus and free of charge services from a dynamic expert panel in reviewing knowledge exploitation cases. The VU also uses contract research, collaborative partnerships and consultancy as a means to commercialize its research base. Its researchers are

involved with contract research on a regular basis, although it is hard to estimate what the regional dimension of this contract research is.

Secondly, the research base at UvA and VU is being commercialized through Intellectual Property (IP) transactions. Here the TTOs play a central role (see above). Thirdly, spin-offs, incubators and science parks also contribute to the commercialization of the research base at UvA and VU. The research universities promote spin-offs and incubators by offering office space for start-ups. The VU provides accommodation for start-ups on its own premises. The UvA is currently running a pilot together with Science Park Amsterdam to provide office space to incubators against reduced costs. Besides these locations selected VU and UvA spin-offs in the field of sustainable energy and mobility may use office space on the New Energy Docks. Fourthly, the research base is being commercialized by offering teaching and training opportunities to regional stakeholders. This mostly happens in the form of language courses (such as NT2, Netherlands as a second language), postgraduate programmes and dual PhDs.

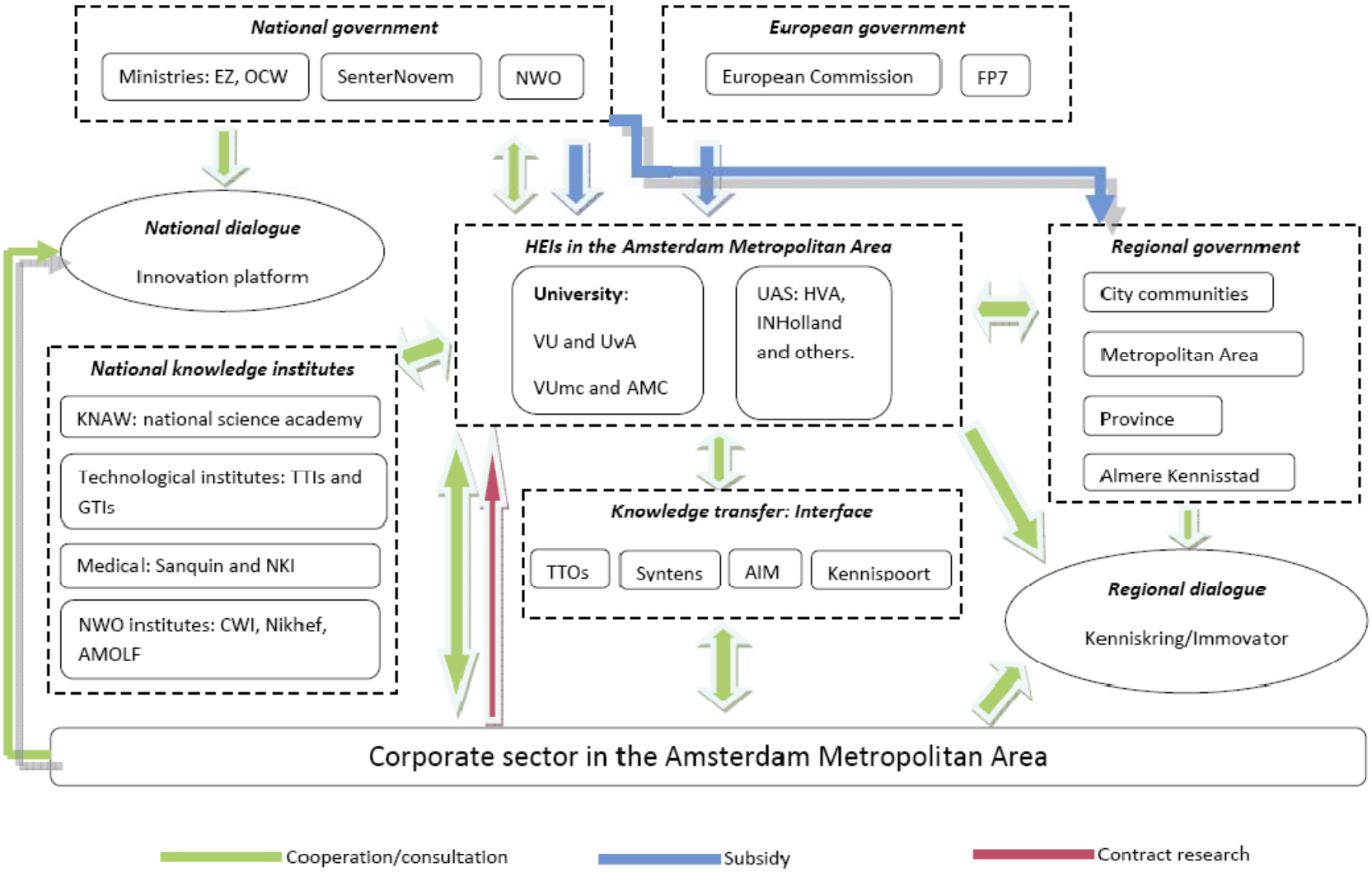
There are a number of structures which are used by the research universities in more widely disseminating its R&D and innovation initiatives beyond its contractual industry partners. Networking meetings and websites are appropriate means to achieve this. For instance, the online portal www.kennispoortamsterdam.nl (see § 3.6) is one structure which leads to a dissemination of knowledge beyond the contractual industry partners of the universities. Another mechanism through which this happens is the Amsterdamse Innovatiemotor (AIM) (see § 3.4), which is an initiative by the UvA and VU together with local governments, chambers of commerce and the banking sector. The AIM seeks to promote innovation, cooperation and industry in the Amsterdam region. It focuses on the following five sectors: creative industry, ICT, life sciences, sustainability, and trade and logistics. The AIM functions as a liaison between knowledge institutions, businesses, non-profit organizations and government. Through its meetings, activities and website, the AIM stimulates interaction between these regional stakeholders.

3.8 Conclusion

3.8.1 The need for cooperation

Innovation is an activity that takes place in a strongly intertwined framework of actors and interests. This applies to innovation at a national scale, as shown in Figure 3-2, but also for the innovation system at the regional level. The need for cooperation within this system is widely recognized among the different players in the Amsterdam metropolitan area. We have discussed several regional policy statements in this chapter and they all underline the need for a joint effort to raise the production of innovative services and goods and suggest different measures to establish and strengthen such cooperative ties. An obstacle in making this regional cooperation effective is the disjointed nature of the regional innovation system in the Amsterdam metropolitan area. Figure 3-6 gives a schematic representation of the mutual relationships involved. The challenge for regional coalition building is to overcome the disjointed nature of the innovation system; to find the key partners and to work together on the basis of a common vision on what innovation in the Amsterdam metropolitan area should achieve and how these goals can be achieved. At present this common vision could be sharpened and requires a more broadly based support from the key players in the region.

Figure 3-6: Regional innovation system



3.8.2 SWOT analysis

Table 3-6: SWOT

Strengths	**Weaknesses**
• Quality and diversity of the HEI-sector • Share of higher employed in the labor population • Innovative clusters • Physical and digital infrastructure • International reputation of the city Amsterdam	• Share of R&D-investment by firms in the region • Incoming R&D-investment by foreign firms • Disjointed nature of innovation system • Venture capital
Opportunities	Threats
• Sense of urgency for innovation in national and regional political circles • Structural changes in the world economy • Changing demand patterns, like ageing and sustainability	• Protectionism in the world economy • Economic effects of the crisis on investment • Governmental complexity • Blockades in the regional housing market and mobility

Strengths

This raises the issue of the strengths and weaknesses involved in building regional innovation coalitions with the HEIs in a key role. The elements of this SWOT-analysis have all been discussed in the previous sections. We shall explain the main elements of the SWOT and refer to the relevant sections for a more detailed exploration.

Concerning the strengths of the role of HEIs in supporting innovation in the region we should first of all mention the very *diverse and high quality* of the supply of knowledge and skills through the HEIs in the Amsterdam metropolitan region. The high quality of the science base is indicated by the ranking of VU and UvA on international listings like the Shanghai index. Also both universities cover a broad area of scientific research. The dynamic nature of this knowledge base is supported by the rapid growth of the number of students and staff at the Amsterdam HEIs in the past 10 years (see chapter 2). The output or result of this increase in knowledge investment is a growing stock of human capital, as indicated by the relative high share of the higher educated in the working population of the Amsterdam metropolitan area (see chapter 1).

Another strength is the presence of several *innovative clusters* of economic activity, several of which have been discussed in this chapter. These clusters indicate that the supply of knowledge in the region meets a demand and that in these areas the coalition building has been successful. It also demonstrates that in these areas – financial services, life sciences and creative industry - the supply of knowledge and skills is able to take advantage of specific competitive strengths of the Amsterdam region. In this connection we should also mention the *willingness* of the regional key players in innovation *to cooperate* as a strength, since this willingness is an important precondition for establishing a more focused set of relationships in the regional innovation system.

A factor supporting economic activity in the regional economy as a whole is *the quality of infrastructure*. Industry and logistics profit from the presence of the Amsterdam harbor and Schiphol airport, which is one of Europe's main air hubs. These are main ports with a high value added for the regional economy in terms of direct economic gain and external effects. This can also be said of the digital infrastructure hosted by AMS-IX, the Amsterdam internet exchange, one of the largest peering internet exchange points in the world.

A final strength is the *international reputation of the city Amsterdam*, which generally carries a positive connotation and attracts tourists and investing firms to the region. There is a mutual dependency in the promotion of Amsterdam as a knowledge hub. On the one hand the city needs a dynamic and successful HEI-sector to brand Amsterdam as a knowledge hub. On the other hand, the association of the name Amsterdam with innovative and high quality science helps the

HEIs to play this role, as it draws talented students and researchers to the region. Investing firms in promising economic sectors are likely to follow in their footsteps.

Weaknesses
The weaknesses of the connection between Amsterdam HEIs and the innovation system are the following. This chapter indicated that the process of generating innovative outputs with high value added from the high quality scientific knowledge available in the region is not as effective as it should be. Innovation surveys indicate for example that the share of innovative services and products in the Netherlands is below the European average. In the Amsterdam region itself entrepreneurs complain that much of the innovation taking place in SMEs is too traditional; process innovation geared at raising cost efficiency rather than product innovation aimed at opening up new markets. Statistical support for such opinions can be found in the size of R&D-investment by firms in the region which according to OECD-statistics is below the national average.

A reason why the valorization of scientific knowledge in the Amsterdam metropolitan area appears suboptimal is the lack of demand driven incentives in the regional innovation system. The TTOs are facilities created to strengthen such incentives, but their foundation is of recent date. Also the HEIs do not experience strong financial incentives to focus their research agenda more strongly on the needs of the business community. The main part of their research budget is lump sum and intended to support a broad and solid knowledge base in society. The change to a more incentive-based set of financing criteria in scientific research is just starting – additional budget is increasingly channeled through the performance-based second money stream – and the HEIs need to adjust to that change. The developing ties with the other partners in the regional innovation system may help them to make this turn.

A further issue on the weak side of the innovation system concerns the availability of preseed and seed capital. National regulation discourages HEIs to take on an active role as venture capitalists due to the financial risks of such commercial ventures and the public nature of their budget. The national government has several programs to promote venture capital, but its innovation instruments are predominantly focused on financing the scientific research base for innovation, rather than helping investors turning these innovations into potentially successful ventures. This leaves the business community itself, which depends on the capital market for the means of investment. Private equity companies and venture capital have been a growth sector in recent years, but the volume of investment is still below international standards (European Commission, 2006: 18). The national government is trying to remedy this defect by means of new instruments, such as the SBIR, the Small Business Investment Research regulation.
A final point in this category is the disjointed nature of the innovation system in the region, which lacks clarity and focus. A more concentrated collaborate effort from the coalition partner based on a shared vision and approach could help improve this situation.

Opportunities
On the side of the opportunities several developments should be mentioned. A first and important factor is the growing sense of urgency among national and regional policy makers that knowledge and innovation are two key economic drivers. A strong and effective innovation system is therefore a main building block of our future economic growth and well-being. This has resulted in several policy statements and agenda, freeing addition financial resources for innovation supporting measures. We have cited several examples in this chapter, such as the *Pieken in de Delta* program from the national government and Amsterdam Topstad on a regional level. This is an opportunity for the region to further its goals on the road to a more knowledge-based and innovative economy.

However, when it concerns the direction of structural economic changes government actions can only be supportive: by and large, the economic structure is made up and therefore determined by the business sector and responds to changing patterns of demand. For this reason it is important to

identify these trends. The pattern of changes in the regional economy of Amsterdam shows the typical pattern of an industrial economy transforming into a services economy. The global changes in the world economy support this change, which is a national rather than a regional trend. Key is that the Dutch economy does not compete with the new competitors in the world economy, such as the BRIC-countries (SER, 2008). Our competitive advantage is higher up the value chain and competition on a global scale pushes us still further up this ladder. The reason is that we shall never be able to compete in terms of labor costs. For us labor productivity is key and this means we have to keep investing in knowledge in order to stay close to the technological frontier and maintain our competitive advantage. The need for this technological race raises the demand for the products and services of the innovative clusters in the Amsterdam metropolitan area.

Structural changes also respond to relative changes in the patterns of demand, which also provide an opportunity. These concern the ageing of the population, which raises the regional demand for the services of the health care and life sciences sector. Likewise the world wide trend towards sustainable economic growth provides an opportunity for the emerging cluster of firms concerned with environmental issues.
There are several regional factors which aid the structural transformation of the economy, such as the geographical location of the region - close to sea and at the cross-road of logistical streams nationally and internationally.

Threats
Several threats accompany this list. First of these is the complexity of the governmental structure involved in the innovation system of the Amsterdam metropolitan area. This body itself is composed of 40 different governments, which makes it hard to reach consensus on a common strategy. This complexity is a risk factor in the establishment of an effective approach to innovation stimulation. National regulation complicates this picture still further, especially as it hinders HEIs to respond to regional needs. We have cited the macro-efficiency test as an example. The involvement of the national government is also a source of uncertainty. Of particular importance to the future of the financial services cluster in Amsterdam is the likely tightening of national regulation for this sector. This may well impede the economic recovery of this sector and stifle the services innovation taking place in this sector.
The changes in the structure of the Amsterdam economy are driven by the dynamism of an open world economy. When the growing protectionism of national governments around the globe hinders the growth of international trade, export oriented regional economies like the Amsterdam one will certainly feel the consequences. This effect can be worsened by the effect of the current economic crisis on the willingness of banks and other investors to supply the financial means for innovative investments.

4 CONTRIBUTION OF TEACHING & LEARNING TO LABOR MARKET AND SKILLS

4.1 Introduction

In this chapter we focus on the roles that higher education institutes play in their contribution to human capital formation in the region. Key issues that will be discussed are:

- Participation in and access to higher education;
- The role of higher education institutes as suppliers of education and the way regional labor market information (demand considerations, imbalances) play a role in the type and number of education programmes supplied;
- Cooperation between institutes and between institutes and the regional business environment;
- Higher education institutes and the entrepreneurial environment.

Section 4.2 gives some figures on supply and demand for higher education. It also presents the main sources of information for monitoring the labor market of the higher educated. Section 4.3 focuses on regional perspectives in education programmes. Section 4.4 discusses student recruitment and the relation between higher education institutes and the labor market. Section 4.5 takes a view on life-long learning. Section 4.6 discusses changing forms of education provision. Section 4.7 highlights the role of higher education institutes in improving the regional learning system. Section 4.8 summarizes and concludes.

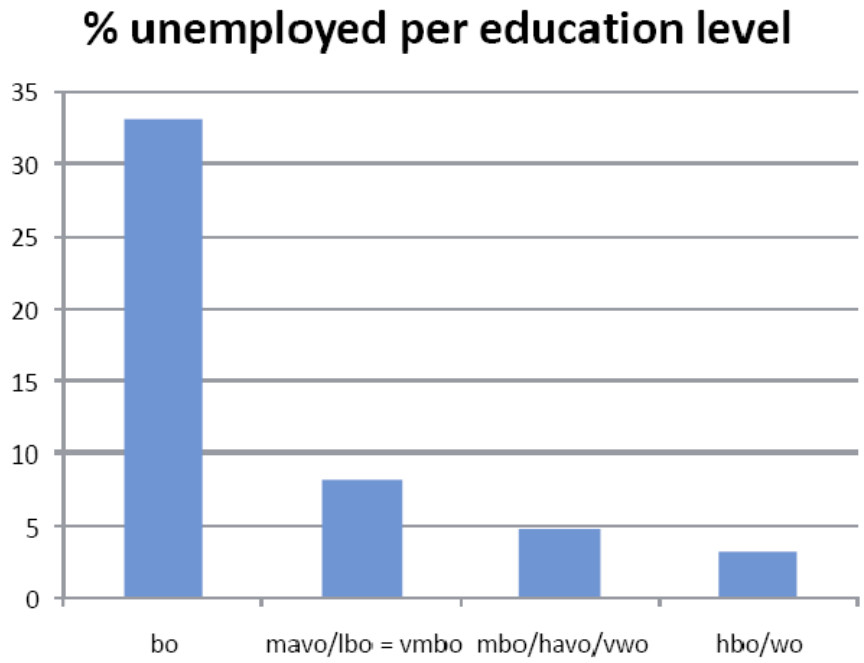
4.2 Supply and demand of (higher) education and the labor market

The demand for education, or better human capital, is for a large part influenced by the supply side of the economy. The industry mix determines what types of education are needed; the knowledge intensity of industries determines the required level of education. The relationship is not one-sided, though. For one thing, the availability of labor is a determinant of the location of economic activity, and the availability of qualified labor influences the types of economic activities in a given location. The relation goes deeper. For example, if labor becomes higher qualified, this may alter production processes; if entrepreneurial capabilities are strengthened, this may stimulate entrepreneurial activities.

From a labor market perspective, balances or imbalances may occur at two levels. There may be an imbalance in *quantities*, for example if the number of persons available for the labor market falls short of the total amount of labor demanded. The number of persons available for the labor market is determined by the amount of working-age individuals and their participation decisions. For example, in the not too distant future, the share of working-age individuals in total population will decrease (ageing of the population), which will lead to some sort of labor market imbalance, until in some way equilibrium is restored. In addition, an imbalance in *composition* may exist, for example if the types and levels of education of persons available for the labor market do not match the types and levels required in the (regional) economy.

An indicator for imbalances on the labor market is the production level. The following figure can be indicative only and shows unemployment rates for part of the Amsterdam region (Amsterdam metropolitan area minus IJmond, Haarlem and Zaanstreek).

Figure 4-1: Unemployment per education level in the Amsterdam region (%)



Source: Calculated from O+S Amsterdam (2008e) (working-age individuals available for labor market, Amsterdam region, figure for 2007), (unemployed, Amsterdam metropolitan area, figure for 2008)

Notice that some (temporary) unemployment will always be present, because that goes with changing jobs or getting a first job. Although more factors influence unemployment rates, it is clear from Figure 4-1 that there is an inverse relation between unemployment rates and education levels. From the perspective of the (regional) performance of higher education institutes, the figure can be interpreted in more than one way. First, getting a higher education degree means *good labor market prospects*. So the institutes seem to be doing a good job. However, the working-age individuals available for the regional labor market may have gotten their education in another region. In the Netherlands, information on the career trajectories of WO and HBO graduates is poorly available (OECD, 2008d: 32).

Second, *not* getting a higher education degree implies worse labor market prospects. The unemployment rate in the group of people with only primary education is ten times as large as in the group of people with tertiary education. Here, there is evidently an imbalance. In the figure, people should move to the right: more people should get education levels higher than basic education. *Participation* in higher education, in other words, should increase. The OECD mentions increasing the number of secondary school students who go on to university and other higher education institutes as one way of making better use of knowledge and skills in the *Randstad* area (OECD, 2007a: 133). Ethnic minorities are underrepresented in tertiary education (OECD, 2007a: 150). For example, over the period 2006-07, 25- 29% of the population (depending on the precise area) consisted of *non-Western* foreign Dutch nationals (*allochtoon*), while 17% of all people who got their higher education diploma were *non-Western* foreign Dutch nationals (Statistics Netherlands Statline, 2009d).

For the past 30 years, the population dynamics of large cities in the Netherlands (including Amsterdam) have been characterized by suburbanization and *urban sprawl*. Increasing welfare and declining transportation costs are the driving forces behind this process. What also has contributed to suburbanization are the often crowded housing markets of cities, as a result of which housing prices are driven up. Fewer people will then be able to afford housing. Amsterdam in particular faces this problem severely. One of the byproducts is the development of a divided

housing market, on the 'buying market' housing prices are upwardly moving – thereby driving potential buyers off the market – whereas on the 'renting market' students as well as economically and socially disadvantaged groups queue up for cheap social housing.

Due to the above phenomena the growth of the city population is lagging behind that of suburban areas. On the medium to long term this implies that employment will shift to the suburban areas as well, since evidence indicates that employment follows population development and not vice versa (Janssen et al., 2006: 20-23). Moreover, suburbanization and urban sprawl are selective because they apply to the relatively well-off, leaving the economically and socially disadvantaged groups in the cities. A disproportionate share of the economically and socially disadvantaged is constituted by minority groups with a non-Western origin (non-Western foreign Dutch nationals). Not surprisingly therefore is that Amsterdam has a higher than average share of non-Western foreign Dutch nationals compared to the rest of the Netherlands and that this group on average faces higher unemployment rates. Hence, whereas in the Amsterdam region the share is 25-29 % (depending on the exact region), the Dutch average is around 11 %. In the Netherlands as a whole, the share of people aged between 15 and 65 who are receiving social benefits is 14.3% for native Dutch nationals and 25.2% for non-Western foreign Dutch nationals. In Amsterdam, 18.1% of native Dutch nationals aged between 15 and 65 are receiving social benefits, whereas for non-Western foreign Dutch nationals this is 26.2% (Statistics Netherlands Statline, 2005c).

Good labor market prospects are one side of the story. The other side is how easy it is for businesses to recruit the labor they need. The European Cities Monitor 2008 (Cushman & Wakefield, 2008) gives information on business location decisions. In 2008, Amsterdam ranked fifth in terms of recruiting qualified staff (of 34 cities in Europe, including Instanbul). So also in this respect the HEIs seem to be doing well, with again the qualification that the working-age individuals available for the labor market may have gotten their education in another region. Also, in the short and medium run the demand for tertiary education may be larger than supply, especially concerning technology, teaching and health care (Jonge and Berger, 2006: 23-24). The OECD mentions that labor shortages are to be expected because of the aging of society and also because of a weak labor market participation of notably single parents, low-skilled women, partially disabled persons and inactive migrants (OECD, 2008c). None of the proposed solutions specifically involves institutes of higher education. The impact of early tracking and of inflexibility between tracks on the educational attainment of immigrants' children is said to be adverse (OECD, 2008a: 56, also see Elk et al., 2009).

4.3 Localising the learning process

4.3.1 Interaction between HEIs and regional needs

In general, in the Netherlands private education institutes are more demand-driven than public institutes. UAS are directed more towards the regional labor market than research universities, given that the latter aim for a more generalist preparation and research. At the same time, UAS have a lower intensity of doctoral training among their staff (OECD, 2008a: 33). The downside of UAS' local employment connections is a lower national, European and global connection (OECD, 2008a: 64). According to the OECD public authorities in the Netherlands have failed to create a policy framework in which tertiary education institutions can fully exploit autonomy through innovation and client-oriented specialization (OECD, 2008a: 34). For example, the so-called 'macro-effectiveness test' (*macro-doelmatigheidstoets*) gives institutes less control over (local) programmes. Hence, regional links are limited to begin with. Platform Arbeidsmarkt en Onderwijs (PAO, platform labor market and education) is a public-private partnership that strives for well-functioning labor markets in the Amsterdam region (PAO, 2009). Especially the municipality and the business sector seem to be active in the platform. VU University Amsterdam for instance is not a partner. PAO's focus is more on primary and secondary education than on higher education, because imbalances are more obvious at the lower levels of education.

One way in which a mutual relationship between a higher education institute (HEI) and the regional stakeholders exists is in the form of regionally-oriented courses, educational programmes, internships and theses. Another way is by providing work-based learning ('dual' education in the Netherlands). By international standards the Dutch HBO sector offers little part-time or dual education (OECD, 2008a: 64). In general it can be said that research universities have a strong theoretical and research-led orientation. This implies that the curriculum is largely supply-induced. This is not to say that there is no interaction between regional stakeholders and the universities. The OECD has even concluded that "even research universities with a strongly theoretical and research-led orientation offer study programmes which are in fact strongly oriented towards working life – including programmes in traditionally vocational study fields, such as architecture, law, and medicine." (OECD, 2008a: 61). In a similar vein, a supply-induced set of courses does not exclude a regional dimension in at least part of these courses. The University of Amsterdam (UvA) for instance mentions the following educational programmes with a regional character: heritage studies, curator, town and country planning, accountancy, forensic sciences, evidence based practice and obstetrics. Other initiatives with a strong regional link in which the UvA participates are the Duisenberg School of Finance (DSF) and the Amsterdam University College (AUC). The DSF has been created in 2008 by seven of the largest Dutch financial sector institutions, with an ambition to create a world class academic institution in finance in Amsterdam. The regional link of DSF is obvious given the strong position of the financial services sector in the Amsterdam metropolitan region. For example, 5.7% of employment in the Amsterdam metropolitan region is generated by financial institutions. The AUC is a new joint initiative by the UvA and VU. It is a small, selective Honours college aiming high at academic excellence and with a strong outreach to the local communities and business life.

Box 4-1: Amsterdam University College

The Amsterdam University College (AUC) is a small, selective Honours college. AUC is a joint initiative by the University of Amsterdam and VU University Amsterdam. In order to realize AUC UvA and VU have combined their resources. The universities have received a Sirius subsidy of EUR 7.5 million from the Ministry of Education, Culture and Science to set up AUC. The municipality contributes another EUR 5 million from the Amsterdam Topstad programme. By creating the AUC, both universities intend to put Amsterdam on the map as a 'knowledge city' and to bring more (international) top talent to Amsterdam. The regional significance of AUC is that two regional universities, which have quite a different profile and a history of competition, have acknowledged their mutual interest and decided to work together in this initiative.

AUC offers a fully English taught three-year liberal arts and sciences programme at Bachelor level. AUC aims high at academic excellence with an international and intercultural focus, as well as outreach to the (local) community and business life. Education at AUC is given from the conviction that talented students of today have to learn, think and work across the borders of language, culture and disciplines. They will have to compete and cooperate on a global scale. AUC intends to be a place where excellence and diversity come together. Compared to mainstream Dutch universities, the AUC provides more demanding, intensive studies with a stronger regional dimension. Education at AUC is characterized by its small scale and high demanding programmes. Per year only 200 to 300 students will be allowed to enter AUC and they are selected based on academic qualities and motivation. Moreover, half of the students come from abroad and the cultural diversity of the students is strongly looked over.

The VU mentions its Zuidas master programme *entrepreneurial law* as the most profound example of regionally-oriented education. The Zuidas master programme has been set up in cooperation with the banking industry and law firms located on the Zuidas business district in Amsterdam. It is directed at fulfilling the regional need for professional and legal knowledge. Moreover, the economics and language departments also offer several educational programmes with a regional relevance. The economics department provides master degrees in logistics and

transport, finance, financial management and accountancy. These are disciplines with a strong connection to the economic profile of the Amsterdam metropolitan region. The language department of VU has recently created the educational programme 'Arts & Market', which focuses on the economic value of arts and delivers knowledge suitable for the auction houses in Amsterdam. The language department also offers a fashion design programme, which connects with the strong position of the creative industry in the region. Aside from its educational programmes at undergraduate and graduate level, the VU also provides courses to postgraduates. While these courses have not been set up in response to regional needs, they are popular among regionally employed people. For instance, within the economics faculty 1,600 employees from (regional) businesses are receiving postgraduate education each year. The VU Law Academy (VULA) organizes postgraduate courses in the field of law. Many lecturers at VULA are practitioners from the banking industry and law firms. Besides giving education to working professionals, the VU also offers higher education to elderly. This kind of education is provided more as a form of social responsibility than a way to generate revenue.

Compared to UvA and VU, the Hogeschool van Amsterdam (HvA) and Hogeschool INHolland offer a curriculum that is more directed towards meeting regional needs. The content of educational programmes at HvA is often shaped in accordance with regional needs. Many programmes use internships as a way to provide practice related knowledge to their students. The HvA also participates in several initiatives where students work together with regional stakeholders. For instance, the department of health at HvA has a national training center to educate nurses and paramedical professionals. It offers training to all regional institutions of health care in Amsterdam. The department of health is currently also developing master programmes in cooperation with working professionals. Another example of demand oriented education is the plan for an educational programme in media studies. The HvA is currently conducting a feasibility study together with media companies in Hilversum to determine if there is need for such a programme. INHolland has set the explicit aim to accommodate its supply of educational programmes to regional needs. The INHolland branch Amsterdam/Diemen is focusing its educational supply on the theme Tourism, Hospitality and Leisure, the financial sector located on the Zuidas, airport Schiphol, innovation in the medical sector (cooperation with AMC and VUmc), ICT as well as the theme Creative City and media corporations along the Hilversum-Amsterdam-Haarlem axis.

The research universities UvA and VU see it as their mission to gear students with academic competencies in order for them to play a valuable role on the labor market. This implies that in principle UvA and VU do not offer educational programmes that are directed towards meeting the short term need for training students for existing known skill number gaps. One exception are UvA's forensic sciences programmes, such as the Master in Forensic Science. Conversely, educational programmes at the medical centers AMC and VUmc are quite strongly directed at regional needs, due to their roles as health care providers to the regional community. On the short term VUmc educates medical and nursing personnel through the Amstel Academie and PAOG (Post Academic Education Medical Science). AMC has similar programmes to fulfill short term skill number gaps. On the medium to long term, AMC and VUmc provide medical specialist educational programmes which are for one part directed at regional needs and for the other determined by the regulatory framework and professional standards. Contrary to the universities, educational programmes at HvA are in general more focused on short term regional needs. For instance, work-based learning arrangements are frequently used within educational programmes. One example of an initiative at HvA with a more medium to long term focus is ITS-Academy, which has been established by UAS institutions and high schools in the Amsterdam region. The goal of ITS-Academy is to promote technical education among high school students.

The UvA and VU are offering a number of learning programmes that aim to enhance the enterprising capacity of students to take advantage of regional issues and opportunities. At UvA, the faculty of economics and business has set up the Amsterdam Center for Entrepreneurship (ACE), which provides the educational programme Entrepreneurship to a broad group of

students. During this programme students are familiarized with entrepreneurship from an academic perspective and during a period of several months set up and run their own business. Another initiative in which UvA and VU participate is the Center of Amsterdam Schools for Entrepreneurship (CASE), which aims to improve education in the field of entrepreneurship. CASE strives to make entrepreneurship a core quality of Amsterdam students and connects students with regional entrepreneurs. CASE also organizes networking meetings, summer schools and workshops for students who start their own business. Moreover, the VU offers a minor in entrepreneurship as part of its regular educational programme. The practice-related components of this programme anticipate on local problems, such as the security, the role of retail organizations and corporate transfers. At HvA and INHolland learning programmes in enterprising take a more prominent role than at the research universities. Entrepreneurship plays an explicit role in all educational programmes at these institutions. At HvA there is a diverse supply of minor programmes in which entrepreneurship forms a central part of the curriculum. Examples of these minors are: Media Entrepreneurship, Health Promotion, Cultural Entrepreneurship, Social Entrepreneurship, Entrepreneurship in Engineering, Entrepreneurship and Public Law for Entrepreneurs. At INHolland students are required to participate in learning-working-companies (*leerwerkbedrijven*) in years two and three of their Bachelor programme. In year two the focus is on learning to enterprise and in year three on innovation development in cooperation with the working field.

4.3.2 The integration of students in the region

Students at HEIs in the Amsterdam metropolitan region contribute to regional development in various ways, such as through internships, volunteering work and possible positive spill-over effects they generate as inhabitants of the city. In general it can be said that students from research universities are less integrated in the region compared to UAS students in terms of course placements, given that universities aim for a more generalist preparation and research. UAS courses on the other hand are more influenced by regional labor market demand. Nevertheless, research universities do promote regional integration of students through internship arrangements and volunteering initiatives. For instance, UvA offers every student the opportunity to spend several periods during their studies to gain practical experience at regional companies and institutions. Internships and educational research are the vehicles through which this is mostly achieved. For instance, all first year students in medicine have to follow a compulsory internship at one of the hospitals in Amsterdam or Noord-Holland. In the economics and law faculties it is also common that Master students spend a part of their studies to do an internship at one of the companies in the region. Besides internships, the UvA also undertakes some specific initiatives aimed at contributing to the city's development itself. Two examples of this are the project *Buurtwinkel, Onderwijs, Onderzoek en Talentontwikkeling* (BOOT) and the educational module *Maakbaarheid in de grote stad*. BOOT is an initiative of UvA and HvA. As part of project BOOT students transfer their knowledge and expertise to people in disadvantaged neighborhoods in Amsterdam. As part of the educational module *Maakbaarheid in de grote stad* students in four multidisciplinary teams solve four pressing urban problems with which the municipality is being confronted. The VU has also initiated several projects directed at contributing to regional development. Two examples are Campus Nieuw West and Project Vooruit. In the initiative Campus Nieuw West students at VU learn youth in Amsterdam West about entrepreneurship. Six different projects are part of Campus Nieuw West. These projects are focusing on career orientation and improving skills that adolescents need to be successful in their professional career. Campus Nieuw West also functions as a mediator between employers and youth. Project Vooruit is a cooperative venture of VU and W&S Transition- and Interim Management in Amstelveen. As part of this projects students from VU receive free housing accommodation in Amsterdam West in return for ten hours of volunteering work with foreign Dutch national (*allochtone*) children and adults.

At HvA and INHolland students contribute to regional development through internships and volunteering work. Internships are a vital part of educational programmes at HvA. Besides this,

HvA participates in several initiatives that promote regional development through volunteering activities. For instance, at practical and research center *De Karthuizer* (see § 3.5) students work together with Amsterdam residents and professionals to solve particular urban social problems. INHolland has also set up a number of initiatives aimed at regional development. Two examples are volunteering activities that students undertake in the Meerwijk borough in Haarlem and the RAAK-financed project *Passend Onderwijs – Passende Methodieken*. In the Meerwijk project students of INHolland conduct volunteering work to enhance the livability, entrepreneurship, participation and care in the Meerwijk borough in Haarlem. In the initiative *Passend Onderwijs – Passende Methodieken* students work together with care institutions in the Haarlem region to develop an effective method to successfully prepare physically or mentally challenged children for a regular school. All four HEIs work together in the City Academy (*Academie van de Stad*) initiative (see also Annex E) that aims to improve the interaction between students which participate in projects, professionals working in the boroughs of Amsterdam and active inhabitants of Amsterdam.

4.3.3 Postgraduate activity and regional needs

Postgraduate activity is geared towards meeting regional needs in a number of ways. At the research universities, there are several channels through which technology transfer to companies and institutions can take place:

- Dual PhD's;
- Extraordinary professors (*bijzonder hoogleraren*);
- Companies and institutions recruit trainees from universities.

Both universities have a substantial number of dual PhD students who are simultaneously employed at companies and (semi) governmental institutions in the region. Moreover, there are many companies, institutions and foundations that finance extraordinary professors to stimulate research into a particular field. Within VU the same mechanisms are at work. The economics faculty of VU has a number of extraordinary professors who receive their salary from an external organization in the Amsterdam region, such as in the disciplines of investment analysis, derivatives and spatial economics. At HvA technology transfer to regional stakeholders takes place mainly through internships, lectors (*lectoraten*), and its educational and research programmes. All departments of HvA have employed one or more lectors. For instance, lectors working at the department of health work at the AMC, which is a large regional provider of health care. These lectors are knowledge experts in their field and are specialists in the application of knowledge in professional context within companies and organizations. HvA also has multiple educational and research programmes that contribute to knowledge transfer to regional stakeholders. For instance, HvA has several institutes that conduct research geared towards meeting regional needs. Examples are *De Karthuizer* and a newly created institute for fashion and technology. The research performed within the domains of HvA itself often also have a regional character. For instance, the domains Media, Creation & Innovation, Education & Raising and Engineering have invested in several practice related research programmes.

4.3.4 Strategic regional coalitions

In recent years HEIs in the Amsterdam metropolitan region have become more aware of the need for and value of coalitions of regional expertise and knowledge around key regional strategic priorities. The number of partnerships and networks in which multiple HEIs in the Amsterdam region are participating is increasing. A good example of this is the Platform Arbeidsmarkt en Onderwijs (see §4.3.1) in which the UvA, HvA and INHolland are participating. An interesting development among the two research universities is that their perception of each other is shifting from a competitive one to a more cooperative one. Nowadays UvA and VU work closely together in a large number of initiatives. The UvA has formulated its strategic goals concerning education and research in the strategic agenda *Leren Excelleren: Instellingsplan 2007-2010* (UvA, 2007).

To achieve its strategic goals the UvA works together with other regional HEIs, the municipality and regional corporations on management, strategic and operational level. The strongest coalitions formed by UvA are with the VU and HvA. UvA and VU work together in a number of cooperative initiatives aimed at improving the (inter)national and regional position of both universities and strengthening primary processes on several domains. The most concrete of these are the Amsterdam University College, Duisenberg School of Finance, Tinbergen Institute, the Amsterdam Graduate School of Science and the cooperation between medical centers AMC and VUmc. Besides this, UvA and VU have strategic meetings about other issues that concern both universities, such as advice regarding international rankings, how to strengthen the position of Amsterdam as a knowledge city and the recruitment and placement of international students and employees.

Box 4-2: Amsterdam Graduate School of Science

The UvA and VU have recently decided to combine their *beta* Master and PhD programmes in a single institute, the Amsterdam Graduate School of Science (AGSS). By doing this both universities hope to increase the attractiveness of their *beta* programmes, in particular for foreign top students in the physics and life sciences fields. AGSS is another initiative which has resulted from the increasing cooperation between UvA and VU (together with initiatives such as DSF and AUC). Besides benefiting from more students, the AGSS will also merge programmes where possible and thus provide more efficient education. AGSS will start in September 2009.

The UvA also works closely together with HvA. Both HEIs for instance have a common Governing Body. The cooperation between UvA and HvA is mainly motivated by a need to streamline the flows of students between both institutions. In the past it was difficult for UvA students to switch to the HvA and for HvA students to continue their studies at the Master level at UvA. UvA is also in similar strategic coalitions with the Rietveld Academy and the Amsterdamse Hogeschool voor de Kunsten. It is also active in the Kenniskring Amsterdam (see § 3.3). In addition of working together with the UvA, the VU also participates in a coalition with Hogeschool INHolland aimed at lowering the thresholds for students to switch from VU to INHolland or vice versa (similar to the UvA-HvA coalition). Recently VU and INHolland have decided to extend and intensify their cooperation, for instance by locating a branch of INHolland on VU premises, creating a common teacher training programme and establishing a shared knowledge institution. HvA also participates in a number of initiatives around key regional strategic priorities. The domain Media, Creation & Information of HvA participates in two institutes that are geared at regional strengths: the Media Lab and the Institute for Fashion and Technology (*Topinstituut voor mode en technologie*). In the Media Lab students of HvA work together with UvA students and researchers to develop innovative applications of interactive media. The HvA also works together with the Chambers of Commerce (KVK) and the borough Slotervaart in establishing the Institute for Fashion and Technology, which aims to provide education and research in the field of sustainable engineering, fashion and design. Although the HEIs in the Amsterdam region predominantly work with each other, they also cooperate with the municipality and regional companies. For instance, the VU and UvA work together with the municipality of Amsterdam in the Amsterdam University College and Duisenberg School of Finance institutions, as well as with respect to more general issues with which they are confronted such as student accommodation. The VU also closes agreements with the municipality to further strengthen the growth of the Zuidas business district and the interaction of the university with firms located there. Recently the municipality and VU have closed an agreement as part of which plots of land on the Zuidas are exchanged, so as to spread the university's and municipality's facilities on the Zuidas. INHolland works together with regional education partners in the *Regionaal Samenwerkingsverband Lerarenopleidingen,* to improve the knowledge and skills of its lecturers and reduce the drop-out amongst teachers in the primary and secondary education. For this purpose, masterclasses, courses and networking meetings are organized for lecturers and applied research is being performed in relation to educational policy. INHolland also participates in the so-called O3-meetings between the governmental, educational and business sector.

4.4 Student recruitment and regional employment

The regional importance of HEIs in terms of recruitment and the relation to employment can be viewed in different ways. If institutes draw a large share of people from the region, *ties* with the region are obviously stronger than if most people come from outside the region. However, there is a difference between ties and *importance*. It may be important for a region to attract students from outside the region, for example to supply the region with a well-educated labor force. If people with a degree subsequently stay in the region, ties are again stronger than if people would leave the region. The latter is sometimes called a 'brain drain'. This is only a good thing for a region in very specific (and uncommon) circumstances, namely if there is a regional oversupply of people with a higher education degree.

4.4.1 Student recruitment

4.4.1.1 Recruitment of national students

UvA and VU essentially recruit students nation-wide, although the strongest emphasis is placed on regional recruitment. For these universities, the largest inflow of students stems from the province of Noord-Holland and Northern parts of Zuid-Holland. This is due to the relatively small travel distance. Students from provinces that are further away often have to travel more than one hour and finding accommodation in Amsterdam proves to be difficult, given the excess demand for student housing. Since the introduction of the Bachelor-Master system in higher education mobility between education institutes in the Netherlands has increased. For the Amsterdam region, this seems to have been a positive development: the amount of people from other provinces who move to the province of Noord-Holland to study and subsequently work is larger than the group of people who are from and study in Noord-Holland but subsequently leave to another province to work (Figure 4-2 and Figure 4-3). The market for Bachelor students is clearly more regionally in scope than the market for Master students. Master students often move into temporary housing for the duration of one year, which makes it easier to find accommodation. Furthermore, these students are often planning to work in the Amsterdam region after graduation, which also lowers the threshold to move to Amsterdam for a Master programme. To recruit Bachelor students, UvA follows a proactive contact strategy to maximize their market share in the Amsterdam region in order to take full advantage of the pool of students for the self-selection process. The VU and UvA both organize information days for students nation-wide several times a year. Besides this, they also maintain close contact with high schools in the region. give an indication of the regional origin and destination of students from the VU.

Figure 4-2: Regional origin of VU graduates

Figure 4-3: Regional destination of VU graduates

* shows in which province the graduates of VU were living at the age of 16 (before they went to study at VU) and Figure 4-3 shows in which province they got a job after graduation from VU
Source: VU University Amsterdam (2009)

Table 4-1: Regional origin and destination of VU graduates

Graduates' living province at age 16	Current working province			
	Noord-Holland	Bordering province of Noord-Holland	Other provinces	Foreign countries
Noord-Holland	30%	10%	1%	0%
Bordering province of Noord-Holland	10%	15%	2%	0%
Other provinces	11%	9%	7%	0%
Foreign countries	2%	1%	0%	1%

Source: VU University Amsterdam (2009)

The favorable labor market prospects in the Amsterdam region and the appeal of Amsterdam as a city makes it easier to recruit Dutch students from outside the region. Other than the research universities, HvA focuses explicitly on the region when recruiting new students. It has intensive contact with 48 high schools and with level 4 vocational MBO schools in the Amsterdam region. HvA organizes information days at these schools as well as at its own location. It has also closed a number of covenants with ROC's (Regional Education Institutes) to streamline the flow of students from MBO to UAS. INHolland also maintains strong relations with level 4 vocational MBO schools in the region and offers an 'intermediary programme' to MBO students to smoothen their transition to the Bachelor level. Another mechanism through which INHolland hopes to recruit new students is by using its alumni to give presentations to prospective students.

4.4.1.2 Recruitment of foreign students

All Amsterdam HEIs have incorporated further institutionalization as an important ambition in their strategic agendas. The strong reputation of Amsterdam abroad gives HEIs in this region a competitive edge against other Netherlands institutions in recruiting international students. UvA and VU have a comprehensive curriculum of English taught Master programmes. UvA's ambition is to recruit 25% of its Master students from abroad by 2010. Furthermore, the new Amsterdam University College is specifically aiming at the market of (inter)national top students. AUC provides exclusively English taught educational programmes. UvA and VU have well developed international recruitment policies. UvA for instance has created international classrooms. It also provides temporary housing to international students. Currently 80% of the international students are living in UvA provided residences. In directing its international marketing campaigns VU places emphasis on European nations and emerging countries such as China, South Africa, Indonesia and Taiwan. It is currently working on a new country policy. Both UvA and VU furthermore provide their international students with introduction programmes, counseling and assistance with practical matters such as housing. They also each have an international student organization that organizes (integration) activities for international students. INHolland has also set the inflow of foreign students high on its agenda. Every year it designates particular 'target' countries and sets goals on the inflow of students from these countries. INHolland subsequently focuses its recruitment efforts (school/university visits, scholarships, marketing) at these designated countries. At the moment INHolland directs much of its attention towards China, Turkey and Morocco, although the bulk of its foreign students still comes from within Europe. INHolland strives to create an 'international community' of students as well as international classrooms. Over the next years Human Resource Management and curriculum development at INHolland will be adjusted to an international work and learning environment and investments will take place in distance learning education, so that students can work together on an international level. In addition, INHolland is looking for foreign universities to form a strategic partnership with, not only to exchange students and lecturers, but also to structurally cooperate in curriculum development and research.

Amsterdam HEIs are quite successful in recruiting international students. However, they are still far from being able to compete with international 'centers of excellence' such as Harvard or the London School of Economics. The AUC is a first step towards creating a top level institute with a strong international profile. An alternative to indigenously creating top level institutes would be to import excellent education from abroad. The government is currently assessing the costs and benefits of opening up the Dutch higher education system to foreign providers. The government's wish for doing so would be to provide competition to local institutions. It aims for a quality stimulus in certain areas in which the Netherlands is lagging behind other countries. The ideal would be to attract excellent institutes such as Harvard. However, a recent market study suggests that there are limited opportunities for foreign institutions to offer 'traditional higher education' in direct competition with domestic institutions and it might therefore be difficult to attract foreign institutions to the Netherlands, if they are required to mainly operate within this area (Tieben, 2008). The limited size of the Dutch higher education market, the high costs of entering it (e.g. accreditation) and the uncertainty regarding future government policy, are all factors that make it unlikely that institutes such as Harvard will open a branch in the Netherlands. Instead of supplying 'mainstream' higher education, foreign institutions are more likely to enter particular niche areas of the higher education sector when the market is liberalized, such as English taught programmes, foreign degrees in English or certain studies for which a *numerus fixus* applies in the Netherlands (ibid).

4.4.2 HEIs as part of the regional education supply chain

In recent years the position of HEIs as part of an education supply chain is an issue that has received heightened political attention. One weak aspect of the Dutch education system is the selection and increased sorting that goes on in primary and secondary schools, plus the difficulty of moving between streams (OECD, 2008a: 52). It can prove to be difficult for someone who is sorted into a low track in high school to move between streams and complete tertiary education. According to the OECD (2008: 56) "The nation's failure to increase the number of students prepared for tertiary education is a serious problem." The Bachelor-Master system is intended to mitigate this problem. The research universities and UAS in Amsterdam increasingly recognize themselves as part of a regional education supply chain and have set policies to smooth the transition from secondary/vocational education to tertiary education and from UAS to universities. The UvA and VU follow a proactive policy of maintaining close contact with high schools in the region. They aim to attract high school pupils by giving guest lectures and organize various activities for these pupils at their universities. Examples of these activities are guest lectures, master classes, visits to scientific labs and research projects where high school pupils and scientists work together to solve a scientific problem or receive assistance from scientists in writing papers. Unique to these kind of promotional activities is that UvA and VU join forces. Both universities operate from the principle that for high school pupils in the Amsterdam metropolitan region in first instance the question *what* to study is more important than at *which* university they should enroll. By working together UvA and VU can promote their educational programmes more effectively. Only at the stage where pupils have to decide where to follow the programme of their choice they become competitors. In addition, the Bachelor-Master system has strongly improved the inflow of UAS students at these universities. The UvA and VU have set up so-called *premaster* programmes for UAS students, which prepare these students for the actual Master programme. Moreover, the increasing cooperation between UAS and research universities on a governance level (such as the common Governing Body of UvA and HvA) also further smoothens the transition from UAS to university. Currently the VU has the largest share of UAS students' inflow in Master programmes. Besides working together with the regional universities, HvA and INHolland have also formed a partnership with ROC's to improve the inflow of students from secondary and MBO vocational schools. INHolland has even set up an 'intermediary programme' for students from MBO schools as part of which they can take courses at INHolland on Fridays for the period of six months. If these courses are successfully passed, these students can get a waiver for up to one semester worth of courses when enrolled at the follow-up programme at INHolland. The popularity of this programme has strongly increased over the last years.

4.4.3 Regional employment

UvA, VU and HvA use several mechanisms to create pathways between themselves and regional firms:

- HEIs keep in contact with SMEs and public sector organizations through regional initiatives such as Kenniskring Amsterdam, www.kennispoortamsterdam.nl, Amsterdamse Innovatiemotor (AIM) and Life Science Fonds Amsterdam. These initiatives have made cooperation between HEIs and the business sector easier and more transparent;
- Researchers at HEIs also have their own network and provide consultancy work;
- HEIs cluster together with companies and other research institutions on business parks such as Science Park Amsterdam, Medical Business Park AMC, Life Sciences Center Amsterdam and the Amsterdam BioMed Cluster (see § 3.5);
- Technology transfer offices (TTOs) of UvA and VU improve communication with the business sector;
- UvA and VU provide accommodation and other facilities to spin-offs on their premises;
- Internships and lectors (at HvA) improve knowledge transfer from HEIs to corporations;

- HvA has made its educational programmes coherent with the competencies demanded by SMEs. The content of these programmes also changes in accordance with developments in the working field;
- The branches of INHolland in the cities Alkmaar, Delft, Den Haag and Haarlem each have an advising council consisting of prominent regional representatives from regional government, the business sector and other organizations benefiting from education at INHolland. This council provides advice regarding the educational policy and facilities at INHolland.

The UvA and VU gather labor market information to monitor the flow of their graduates to the labor market from the WO-monitor, an initiative of VSNU (Netherlands Association of Universities). The WO-monitor is published every two years and includes figures on the qualification and the labor market position of university graduates. The latest WO-monitor covers the years 2004 and 2005 (Allen et al., 2007). HvA gathers labor market information regarding its graduates through two initiatives: ATM (Alumni Satisfaction Monitor) and WTM (Work field Satisfaction Monitor). INHolland conducts similar research amongst its alumni. More general nation-wide information on the labor market position of UAS graduates can be found in the HBO-monitor (Ramaekers, 2008). HvA and INHolland both participate in this annual study. HvA and INHolland furthermore collect labor market information through the PAO. INHolland also mentions the Cross Media Monitor as a source of information regarding the prospective labor market position of its graduates.

The research universities UvA and VU have few specific initiatives or practices to support graduate enterprises in an effort to retain graduates in the region and recruit alumni to return to the region. The UvA works together with Science Park Amsterdam on a regulation that makes it possible for spin-off companies to use basic facilities of the science park against reduced tariffs. Moreover, for the graduates of the minor Entrepreneurship there is a similar regulation for the facilities of CASE and ACE. The VU also provides support to spin-off companies, although not with the specific intention of retaining human capital within the region. HvA has an initiative reminiscent of the one UvA runs: the *Talentenfabriek* (Talent Factory). This is a cooperation between HvA and the business sector that supports starting entrepreneurs with low cost office space, telecom facilities, free personnel administration and end of year audit. HvA aims to stimulate entrepreneurship amongst its students through a minor Entrepreneurship. INHolland aims to support graduate enterprises through its participation in CASE, which for instance has resulted in a minor Amsterdam Entrepreneurship. As part of this minor students are also allowed to do their internship in their own business. The number of students which has done this increased from 19 in 2002/03 to 32 in 2008/09. Furthermore, INHolland has established an office for starting entrepreneurs in the creative industry: GNR8. This office provides several means of support to graduate enterprises. In addition, INHolland Amsterdam/Diemen has created an Entrepreneurial Lab (*ondernemerslab*) that teaches entrepreneurial skills to fourth year students. Fourth year students participating in this initiative are required to start a new business every year as a graduation assignment. Students are selected based on motivation and competences.

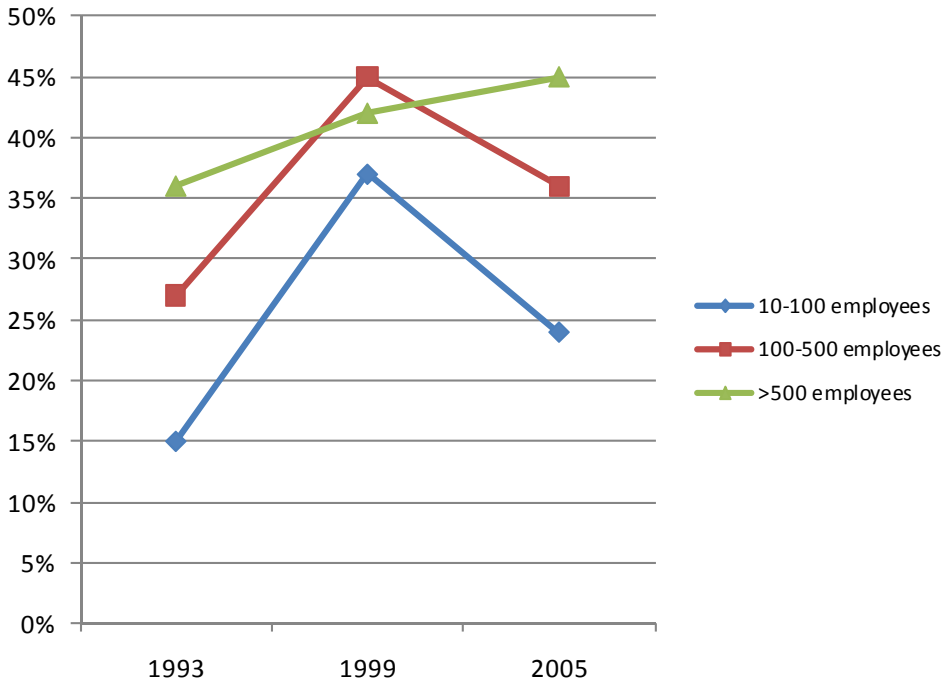
4.5 Promoting lifelong learning, continuing professional development and training

4.5.1 Lifelong learning, continuing education and professional development

The Dutch government regards lifelong learning, continuing education and professional development as a top priority. An optimal exploitation of the present knowledge base is essential for the Netherlands in the light of ageing and a rapidly rising dependency ratio. Therefore, the government wants to increase the labor force participation of elderly, women and foreign Dutch nationals. Lifelong learning is a prerequisite to achieve this goal. Currently 25-35% of the labour force is on some sort of company training (depending on company size, see Figure 4-4). But according to the Innovation Platform only 17% of employees participate in some form of lifelong

learning (Innovation Platform, 2006: 22). In the Knowledge and Investment Agenda (KIA) the government has set forth its aim to invest EUR 250-500 million to improve lifelong learning by broadening the educational borrowing system to those 30 years and older, stimulating dual work-learning trajectories and creating an 'individual schooling facility' for employees (ibid: 26). The government furthermore hopes for an additional EUR 500-1000 million contribution from employers (ibid: 26). By 2016 it wants to have achieved that 35% of employees participate in lifelong learning (ibid: 22).

Figure 4-4: Percentage of employees in the Netherlands participating in lifelong learning, by company size



Source: Statistics Netherlands Statline (2007b)

The promotion of lifelong learning by higher education institutes in the Netherlands consists of three main channels: Master programmes that can be followed after a Bachelor degree has been received (elsewhere); postgraduate education; and post-initial educational programmes. Training is also provided by private training institutions. In the Netherlands, tuition fees may be higher for students over the age of thirty and for students taking unsubsidized courses, which could suppress participation (OECD, 2008a: 46). The HEIs in Amsterdam have multiple programmes and other initiatives through which they promote continuing education and continuing professional development activity of their employees. These can be found in Annex G.

Box 4-3: Market failure in lifelong learning

Lifelong learning increases productivity, which is favorable for both employer and employees. However, since employers are uncertain as to whether they can reap the full benefits from this productivity increase (employees may leave the firm at some point), they invest a suboptimal amount in training. Employees find it difficult to invest in lifelong learning due to liquidity constraints. Without government intervention investments in lifelong learning will continue to be below optimal. Employer subsidies or educational borrowing facilities for employees are examples of concrete measures that could mitigate this market failure. Even though the Dutch government is taking measures to promote lifelong learning, many steps still have to be taken. This conclusion also applies to the regional level.

The HEIs have several external and independent enterprises to extend professional education provision to the region. UvA and VU are both partners in the Duisenberg School of Finance, which for instance offers a PhD track in Finance. Both universities also participate in ACTA Dental Education, an institute that provides seven different post doctorate programmes in dental care. In addition, the UvA provides professional education through the Eggens Institute (provides law courses), the Amsterdam Business School (postgraduate programmes in Finance) and the *Centrum voor Nascholing Amsterdam* (educational programmes and refresher courses on didactics). VU has the following independent enterprises for professional education provision: Fewebs Postgraduate School for Professional and Executive Education (PSPEE), VU Law Academy (see § 3.5), Amstel Academie VUmc and Zuidas ABC. Postgraduate education at HvA is provided internally by the different domains themselves. Each domain has its own initiatives for professional education provision to the region, such as the postgraduate education for nurses in the domain Health. At INHolland postgraduate education is given in the form of regular Master programmes, the INHolland Academy (post-initial education) and the yearly event 'Show and Share' (sharing professional knowledge and best practices).

HEIs in Amsterdam often work together with regional partners in providing postgraduate education to the region. UvA works together with the following stakeholders:

- Duisenberg School of Finance: ING, Aegon, Fortis, APG, NYSE Euronext, SNS Reaal, Dutch Central Bank, VU University Amsterdam, Erasmus University Rotterdam, Tinbergen Institute and Tilburg University;
- Eggens Institute: Juritas knowledge center for administrative law;
- Teacher education: regional schools;
- Educational programme Conservation and Restauration of Cultural Heritage: Instituut Collectie Nederland (ICN);
- Centrum voor Nascholing Amsterdam: HvA;
- Amsterdam School of Health Professions: AMC, HvA.
- New Energy Docks: Shell, Nuon, BAM, ING Real Estate and VU University Amsterdam.

VU cooperates with the following stakeholders:

- Duisenberg School of Finance: ING, Aegon, Fortis, APG, NYSE Euronext, SNS Reaal, Dutch Central Bank, University of Amsterdam, Erasmus University Rotterdam, Tinbergen Institute and Tilburg University;
- PSPEE: Atos, PricewaterhouseCoopers, KPMG, Ernst & Young and Deloitte;
- Zuidas ABC: ABN AMRO, ING, NUON, KPMG, Schiphol Group, IBM, Yacht, Multi Vastgoed, Ymere, Vesteda, TIAS-Nimbas, Baak and Holland Festival;
- New Energy Docks: Shell, Nuon, BAM, ING Real Estate and University of Amsterdam.

HvA cooperates with the following stakeholders:

- Pro Education BV;
- HEIs: Uva/AMC, VU/VUmc, Hogeschool IPABO, INHolland;
- Centrum voor Nascholing Amsterdam;
- Platform Arbeidsmarkt en Onderwijs (see § 4.3).

4.5.2 Education and minority groups

One significant issue in the Netherlands is the low participation in higher education by non-Western minorities (OECD, 2008a: 52). The participation in tertiary education of non-Western foreign Dutch nationals in the age category 17-25 year increased from just 10% in 1995 to 16% in 2002 (Jonge and Berger, 2006: 50). However, the general participation in tertiary education increased as well. This leaves the relative position of non-Western foreign Dutch national students approximately the same. The gap in relation to Dutch youngsters or Western foreign Dutch nationals is still considerable. The gap is particularly wide for the 'first generation

migrants'. The second generation of non-Westerners (born in the Netherlands) however, is catching up rapidly.

The low share of foreign Dutch nationals participating in tertiary education is an issue high on the agenda of Dutch government. According to Jonge and Berger (2006) the Dutch central government has stimulated the development of talent with non Western background in four different ways:

- The ministry has made an agreement with 22 HE institutes in order to enlarge the results of nonWestern students (budget yearly EUR 1.5 million for a period of 3 years);
- ECHO has been asked to develop a network of successful non Western graduates and students;
- At several locations Imam training has started to strengthen integration of Muslims in Netherlands;
- The minister subsidizes the organization of refugee students (UAF). The yearly budget is EUR 2.6 million.

Table 4-2 gives an overview of how foreign Dutch nationals (*allochtonen*) are represented in the student population of VU, HvA and INHolland.

Table 4-2: Share of foreign Dutch nationals in student population of Amsterdam HEIs

HEI	**% foreign Dutch national students**
University of Amsterdam	28.6%
VU University Amsterdam	30%
Hogeschool van Amsterdam	36%
Hogeschool INHolland	38%

The participation rates at INHolland (see Table 4-3) show that allochtonen are catching up very quickly, which supports the observation of OECD (2008a: 53) that they are enrolling in greater numbers. However, the OECD report also raises concern about the completion rates which are lower for allochtonen than for other students. Table 4-4 shows evidence for this conclusion based on completion rates at the University of Amsterdam. The completion rates in this table are calculated for students at the bachelor level and show the percentage of students per cohort that obtain their bachelor degree within 4 years. This observation corresponds with the situation at other Amsterdam HEIs. According to INHolland, non-Western minority students more than average experience financial and language problems, which explains their higher drop out rates (INHolland, 2008: 16).

Table 4-3: Participation rates of non-Western minorities at Hogeschool INHolland, 2004-2008

Location	**2004-2005**	**2005-2006**	**2006-2007**	**2007-2008**
The Hague	26.4	34.1	29.1	35.4
Haarlem	13.6	14.5	13.7	17
Amsterdam	24.3	29.8	38.6	46.3
Diemen	30.5	34.8	38.2	39.2
Rotterdam	32.3	40.9	51.4	52.8
Average INHolland	21.3	26.2	28.6	31.3

Source: INHolland, Annual report 2008, p. 16.

Table 4-4: Completion rates of different ethnic groups at the University of Amsterdam

Cohort (year)	Ethnicity	Completion rate (within 4 years)
2003	**Total**	**43%**
	Dutch	46%
	Non-Western minorities	31%
	Western minorities	38%
2004	**Total**	**48%**
	Dutch	50%
	Non-Western minorities	34%
	Western minorities	43%

The UvA and VU universities have a number of policies in place to promote the inflow and career prospects of traditionally under-represented groups such as ethnic minorities and women. Nevertheless, these policies are generally *ad hoc* initiatives that are not of a large enough scale to seriously tackle the problem of low participation by non-Western minorities. UvA has no active policy to improve access of foreign Dutch nationals living in the Amsterdam metropolitan region. However, it does give refugees with an academic degree the opportunity to gain work experience at its university. VU has a relatively high inflow of foreign Dutch nationals and has not implemented specific measures to increase this inflow. It does, however, attempts to reduce the relatively high drop-out rate amongst this group by giving study advice and informing these students about their career prospects. VU also directs policies to improving social cohesion within the student community, for instance by encouraging communication between different social groups. It has also established an organization to promote diversity in education, research and human resource. HvA does not have specific policies to promote the position of ethnic minorities. INHolland follows an active policy to improve the participation of foreign Dutch nationals. Ethnic diversity is safeguarded through intake conversations with new students and through special 'diversity programmes' that have to reduce the drop-out rate amongst traditionally weak social groups.

The other traditionally under-represented group at HEIs are women. The percentage of female students in higher education has increased to above 50%. However, the percentage of women in higher management is still low, especially in universities. In the Netherlands the number of female college professors is still well below 10%, although this number has increased over the last few years (Jonge and Berger, 2006: 8). In order to promote the flow of women to top positions, UvA, VU and INHolland have signed the Charter *Talent naar de Top* (Talent to the Top), which commits them to reach particular quantitative goals regarding the number of women in higher job positions. Their progress is being monitored by an independent commission that will brief the HEIs on their performance. The idea is to create a female-friendly culture in HEIs so that the pool of women with the competencies of fulfilling higher job positions is enlarged. The current percentage of women executing top positions at VU is low: there is one woman in the Governing Body and 11% of the professors are female. Among service and supporting personnel the representation of women is better (about 50%, also on higher positions).

4.6 Changing forms of educational provision

The UvA and VU use a number of mechanisms to promote flexible education provision, although they adhere to the principle that these should not lead to a loss of interaction between people. In other words, flexibilization mechanisms such as ICT-based course delivery are used as supporting instruments. They have not changed the role of higher education itself. UvA prefers to give its primary education on one of its four campuses across Amsterdam. It does however use electronic learning environments and e-learning to provide educational material to its students. UvA moreover has a number of organizational parts (AMSTEL institute, Information center) that work on the development of tools to improve e-learning. UvA uses ICT as a means to make education more flexible, improve the quality of education and to enhance the bonds between educational

programmes and their participants. In order to enhance educational opportunities to a wider group, lectures are increasingly made public over the internet. UvA aims to reach elderly in particular and perceives ICT-based education as another step in providing education to the benefit of 'life-long learning'. Another form of flexible education that receives increasing attention are honours programmes (see Box 4-4).

Flexible education provision is also a growing theme at HvA. In all domains there is attention for the career development of individual students. The essence of flexible education at HvA is that students receive education tailored to their competency level. The different educational forms (full-time, part-time, dual) provide some flexibility as well. Within the different educational programmes at HvA, students can also choose learning routes and graduate tracks. Examples of flexible learning routes are deficiency programmes and excellence programmes. E-learning tools are increasingly introduced at HvA as well. However, the increasing use of ICT at HvA (but also at UvA and VU) should be seen as a complement to traditional face-to-face education, instead of a substitute of the latter. HvA uses electronic learning environments to support cooperation and the provision of information to students, lecturers and other employees. In addition, HvA uses 'web classes' and video conferencing. It has also implemented the Student Information System, an online database containing information about students. Besides this, HvA has also implemented tools for digital examination, gaming, discussion forums and several other things. The intensity of use varies considerably between different educational programmes and domains. At INHolland the broad range of educational programmes and study paths guarantees that students have a great deal of flexibility in determining their study trajectory. INHolland currently has around 500 differentiation minors from which students can choose, but is planning to reduce this number to around 300-350 in order to simplify choice and create feasible and coherent study paths. ICT-based education also plays an important role at INHolland and is available at study places as well as remotely from students' homes.

Box 4-4: Honours Programmes

The UvA and VU Honours Programmes are supplementary educational programmes that are offered to talented and motivated students who like to invest more time in their own area of study and to broaden their horizon. Honours Programmes are a relatively new phenomenon in the Netherlands but have now been implemented at virtually all universities in the country. The reason for the creation of Honours Programmes is that many students at universities in the Netherlands do not feel sufficiently challenged. At UvA the Institute for Interdisciplinary studies organizes Honours Programmes since 2001. The UvA Honours Program is divided into disciplinary honours programs and interdisciplinary honours courses and options. Students are selected based on motivation, an essay and an intake conversation. Participating students have to take courses within their own department and interdepartmental courses for a total minimum of 30 extra credits. The Honours Programmes are taught in Dutch and/or English. A Honours Programme Certificate is awarded to those students who graduate for their Bachelor and Honours Programme with at least a 7.0 for all courses. UvA has set the ambition to attain by 2014 a 10% participation rate amongst Bachelor students in the honours programme. The VU Honours Programme looks very similar. The Honours Programme starts in the second year of the Bachelor's programme. Participating students take courses within their own department and interdepartmental courses for a total of 30 extra credits. To participate in the Honours Programme students must be highly motivated, have good grades (GPA of 7.0) and have passed all their first year Bachelor courses. The Honours Programme is taught in English. Graduates receive a Bachelor Honours Degree.

4.7 Enhancing the regional learning system

The OECD mentions that, in the *Randstad* as a whole, increased specialization by universities and better coordination between them may increase knowledge clusters and the quality of universities (OECD, 2007a: 132). It warns for the duplication of research efforts in for example life sciences, in which field at least four universities in the Netherlands (of which two are in the Randstad) were trying to become the leading one (ibid: 131). In recent years HEIs in the Amsterdam metropolitan region have been working towards a more coherent vision of the regional education system. Whereas HEIs used to have individual views on education, there is now a sense of urgency that cooperation is necessary. For instance, UvA and VU work together in a number of cooperative initiatives such as the Life Sciences Center Amsterdam (Amsterdam BioMed Cluster), the Amsterdam University College, Duisenberg School of Finance, Tinbergen Institute, the Amsterdam Graduate School of Science and cooperation between medical centers AMC and VUmc (see § 4.3). Besides this, UvA and VU have strategic meetings about other issues that concern both universities, such as advice regarding international rankings, how to strengthen the position of Amsterdam as knowledge city and the recruitment and placement of international students and employees. Moreover, the relatively new Bachelor-Master system has also created more opportunities for cooperation between the research universities and UAS in the region. For example, The UvA has a joint governing body with HvA and VU has formed a coalition with Hogeschool INHolland (see § 4.3). In addition to cooperation with other educational institutes, the HEIs also frequently work together with the municipality of Amsterdam, companies and other public or non-profit organizations. VU stresses that on a central policy level HEIs and other regional stakeholders mainly discuss how cooperation can be made possible, while the actual cooperative initiatives are mostly taken on a decentral (faculty) level.

The HEIs to some extent use data analysis on the demand and supply of different types of higher education product within the region. VU communicates with INHolland and especially UvA. VU and UvA are also in touch with the municipality of Amsterdam (one 'liaison officer' has been appointed for both VU and UvA). In the cooperative initiative *Study Amsterdam* all higher education institutes in the region, together with the municipality of Amsterdam, consult each other with respect to recruitment of (international) master students. As part of Study Amsterdam estimates have been made regarding the quantitative supply of foreign Bachelor and Master programmes at UvA, VU, HvA, INHolland and the Amsterdam School for Arts. The results have been used to create a shared website www.studyamsterdam.nl that promotes these programmes to prospective foreign students. HvA also conducts labor market research as part of its macro effectiveness tests (*macro-doelmatigheidstoets*) when developing new educational programmes. This research often results in new kinds of educational product. The Platform Arbeidsmarkt en Onderwijs also provides useful labor market information to HEIs. Besides this HvA conducts structural research on the characteristics and interests of (prospective) students. On basis of this research HvA is able to gain insight into the desires and expectations of this target group. The INHolland school of economics Diemen/Amsterdam has performed together with the working field medium term labor market analysis of the demand for and supply of different types of education product and the number of graduates. This research has for instance pointed out that there is an excess demand for qualified teachers (a nation-wide issue). INHolland has responded to this by putting additional effort in recruiting students for teacher training programmes. However, there are no specific procedures in place to support regional collaboration between HEIs in conducting analysis to establish the demand and supply of different types of higher education product within the region.

The flexible transfer of students between different HEIs is enhanced by coalitions that are formed between UAS and research universities. Two of these coalitions, UvA-HvA and VU-INHolland are particularly important given the size of the student population of these HEIs. The Bachelor-Master system has eased the transition of UAS students to universities. In many cases students who have graduated as a Bachelor from a UAS can subscribe for a Master programme at a research university. For example, students who have a Bachelor in law from HvA can enter into a

Master in law programme at UvA. To smooth the transition between UAS and university, students can take a minor during their Bachelor to prepare them for the university Master. Universities on their turn often oblige UAS students to follow an 'intermediary programme' (*schakelprogramma*) for students in-between their Bachelor and Master. Furthermore, UAS in the region are increasingly putting effort in recruiting students from MBO schools. As was mentioned earlier HvA and INHolland also run intermediary programmes for MBO students.

The links between research universities and other HEIs exist on the executive, strategic and operational level. Table 4-5 summarizes these links.

Table 4-5: Executive, strategic and operational links between research universities and other HEIs

Executive	**Strategic**	**Operational**
• UvA and HvA have a common Governing Body; • Governing Body of VU and INHolland meet biannually ; • Chairmen of UvA and VU meet every six weeks and there is a periodical meeting between the Governing Body of both HEIs. Furthermore, UvA and VU share one 'liaison officer'; • HEIs meet regularly with the alderman of the municipality around the *Amsterdam Topstad* initiative.	• UvA-HvA and VU-INHolland have eased the transition from UAS to university and vice versa; • HEIs have formulated a common strategy to recruit foreign students (Study Amsterdam); • Medical centers of UvA and VU cooperate to attract talented students, scientists and investors; • HEIs cooperate with other organizations in strategic bodies (Kenniskring, Amsterdamse Innovatiemotor (AIM), Amsterdam Topstad, Life Science Fonds Amsterdam).	There are many initiatives in which two or more HEIs participate: • Amsterdam University College (AUC); • Duisenberg School of Finance (DSF); • Tinbergen Institute • Amsterdam Graduate School of Science (AGSS); • Media Lab; • Amsterdam Life Sciences Center (ALSC); • Academic Center for Dental Care Amsterdam (ACTA).

4.8 Conclusion

Table 4-6: SWOT

Strengths	Weaknesses
• Diversity of educational supply • Share of highly educated in the labor population • Ties of UAS with the local business community, especially SMEs • Cooperation between HEIs • International reputation of Amsterdam	• Limited recognition of need for lifelong learning in business community; probably caused by market failures • Entrepreneurship among graduates • Failing institutions like PAO: not effective governing body for HE • No structural monitoring of labor market developments • Supply driven orientation on the part of VU and UvA
Opportunities	**Threats**
• New initiatives like CASE to spur on entrepreneurship • Internationalization through Bologna process. • Need for reforming labor market institutions • Unused talent among specific groups in society	• Complexity governmental structures • Housing market • National regulation • Threat of polarization on the labor market: ethnic minorities are underrepresented in HE

The OECD concludes that the Netherlands has an educational system that, viewed in international perspective, is strongly oriented towards employer engagement and working life (OECD, 2008a: 59). At the secondary level, a large proportion of students study in vocational programmes, while at the tertiary level perhaps the largest share of students in any OECD country study in professionally oriented institutions of higher education, the *hogescholen* or UAS.

Strengths

The densely populated Amsterdam metropolitan region facilitates many HEIs. For instance, Amsterdam is the only city in the Netherlands with more than one university. This widespread presence of HEIs implies a diverse supply of educational programmes. The presence of these educational facilities causes a well-educated population: In the Netherlands as a whole the share of higher educated in the labor market population is 32% (Statistics Netherlands Statline, 2008d). In the Amsterdam metropolitan region this is about 40% (Statistics Netherlands Statline, 2007a). The labor population is also relatively young, which may be a stimulating force for economic growth.

There are strong links with the business community, especially in UASs. They offer courses which are monitored in cooperation with the relevant business sector to ensure that educational supply meets demand. Also all students follow some kind of work-based learning, which likewise establish ties between the UASs and the business community in the region.

The HEIs in the Amsterdam region increasingly work together. This occurs for instance in joint promotion campaigns for student recruitment, which strengthens the regional ‘educational chain’. Also the HEIs work together in the field of international promotion for *Study Amsterdam*. This aids the international profile of Amsterdam as an attractive knowledge hub. This aim is closely related to the international reputation of Amsterdam, a factor which also figures in the SWOT analysis for the innovation system.

Weaknesses
Concerning the need for life-long learning, there is a surprising rift between the sense of urgency in political circles and the business community. Firms run into specific labor market failures such as poaching, which may cause them to sub optimally invest in the knowledge skills of employees. Somehow this deadlock needs to be broken in order to provide a better climate for life-long learning.

Another weakness is the entrepreneurship among Dutch students. International comparisons show that Dutch graduates in higher education are much less inclined to start their own business than in other countries. Especially in universities entrepreneurship is not highly regarded as an academic skill to be included in the curriculum and even less so as a practical skill. At the UASs such as HVA and INHolland the situation is better. Here entrepreneurship is often part of a minor at the bachelor level and even forms a subject suitable for a graduation project. The schools encourage that students actually set up and run their own businesses and so earn credits for their degree.

Institutions designed to better connect the labor market and the educational system do not always function effectively in the case of higher education. An example is the Platform Arbeidsmarkt en Onderwijs (PAO, platform labor market and education) which is mainly focused on primary and secondary education, because labor market imbalances are more obvious at the lower level of education. Especially the municipality and the business sector seem to be active in the platform. Some large HEIs in the Amsterdam region such as VU University Amsterdam, are not participating in PAO. This implies that PAO will be less effective in bringing HEIs and the business sector closer together.

It is noteworthy that with the exception of HvA the HEIs do not structurally monitor the development of the labor market. VU and UvA rely on a national monitor which currently offers outdated statistical data.

The educational programmes at research universities are generally supply-induced, given that universities have a strong theoretical and research-led orientation. This implies that university education is not as responsive to regional needs as might be optimal for the regional labor market.

Opportunities
There are several new initiatives to boost entrepreneurship like CASE. European developments like the Bologna process stimulate the international mobility of students. This provides a stimulus for the internationalization of higher education and may prove a dynamic force for Amsterdam HEIs.

Global competition may likewise prove a force in the adjustment of the institutional structure of the labor market. This can be seen in the current debate on the future of the welfare state in the face of an ageing population and increased worldwide competition. This pressure for restructuring offers an opportunity to modernize labor market institutions, which may aid the interaction of supply and demand in the market for highly educated labor.

Threats
The complexity of the relationships between the governments involved in the Amsterdam metropolitan area likewise poses a threat to labor market efficiency as it does to the functioning of the innovation system.

The excess demand on the Amsterdam housing market constitutes severe problems. Students who have a need for low cost housing are increasingly being driven off the Amsterdam housing market by higher earners. The waiting lists of housing corporations for student housing can run up to 8-10 years. Further, the relative high costs of living in the Amsterdam area causes a suburban sprawl: people leave the city and settle in adjacent suburban areas. The problem is that work tends to follow people. The relative decline of the growth of labor supply in the city of

Amsterdam is matched by a relative decline of employment. If this process continues, it may weaken the business climate of the Amsterdam region, especially when adjacent regions are solving similar problems faster. The strain on mobility in the region (traffic congestion) is a complementary factor.

The 'macro-efficiency' test by the Ministry of OCW is a decision designed to prevent proliferation of similar/comparable programmes in places very near to each other (OECD, 2008a: 87). In practice however this test impedes HEIs' in developing more innovative discipline areas that would appeal to students and new industries alike. By protecting the status quo the macro-efficiency test restricts the real options on offer (ibid: 87).

Non-Western foreign Dutch nationals are significantly underrepresented in tertiary education as compared to native Dutch nationals. Given that the Netherlands has a knowledge-based economy this inevitably translates into worse labor market prospects for ethnic minorities. For instance, the percentage of non-Western foreign Dutch nationals receiving social benefits is significantly higher than for native Dutch nationals, both nation-wide and in the Amsterdam metropolitan region.

5 CONTRIBUTION TO SOCIAL, CULTURAL AND ENVIRONMENTAL DEVELOPMENT

5.1 Introduction

The contribution of higher education and research goes beyond the fields of innovation and the labor market. It is the explicit aim of this chapter to show that the impact of HEIs in the region is likewise felt in the areas of social, cultural and environmental developments. One may regard developments in these areas as a form of 'capital' adding value to the standard productive capital goods, capital and labor. Their products or added value arises as indirect economic benefits as well as in the shape of intrinsic benefits, as the OECD concluded in its report on the previous round of reviews in this program (OECD, 2007b: 166). The benefits in question concern the supportive and stabilizing effects of these developments on economic growth and their direct benefits in terms of community health and welfare, social cohesion and a clean and healthy living environment. Key issues that will be discussed in this chapter are:

- The contribution of HEIs in the Amsterdam metropolitan region to social, cultural and environmental developments;
- The role of HEIs in furthering such developments and the way they achieve this;
- Regional cooperation as an instrument to further the goals of social, cultural and environmental development.

For this purpose section 5.2 first looks into the issue of social development. Sections 5.3 and 5.4 subsequently address cultural and environmental development respectively. The chapter closes by drawing conclusions about the collaboration of the regional stakeholders, including an assessment of the strengths, weaknesses, opportunities and threats related to social, cultural and environmental development (section 5.5).

5.2 Social development

5.2.1 Welfare state and social development

5.2.1.1 Social policies as part of the economic agenda

The economic benefits of social policy is an issue that in recent years surfaced in the literature on the restructuring of the welfare state. In modern welfare states like the Netherlands the globalizing economy and an ageing population raise difficult questions about the future costs of our system of social benefits and health care. It is estimated that over the next 30 years the costs of health care will rise by 4.3%-points of GDP, while public pensions cause the burden of public expenditures to rise by another 4.1%-point (Van Ewijk et al. 2006: 81). This causes an upward pressure on the tax burden and the wedge between net and gross labor costs, undoing the results of a decades-long and painful social restructuring process. In order to remain on the competitive edge in the global economy the Dutch social system needs to be 'lean and mean', which generally means cheap and harsh on the less well-to-do. Or is there an alternative? Recent research suggests that different social systems produce different results on the axis between economic growth on the one hand and social equity on the other, and that the classical trade-off between economic efficiency and equity need not necessarily obtain (De Mooij, 2006). The strong economic performances of the Nordic countries of the past 15 years underpin this finding (Aiginger, 2005). They form corporatist societies with a strong role for the state and its accompanying high tax burden. Nonetheless, before the current economic crisis countries like Finland managed to produce above-average per capita economic growth with high R&D-investment and solid public finances. The success brings some to support the notion of a Nordic social model, just like the Dutch 'polder' model was once held out as an example (Visser and Hemerijck, 1997).

The challenge for future social policy in the Netherlands is to strike the right balance between the need for economic competitiveness and social cohesion. Social cohesion may help competitiveness by reducing the opportunity costs of social exclusion, social unrest and the loss of human capital that is generally associated with the weak labor market position of disadvantaged groups in society. The intrinsic benefit of social policy is that the fruits of social services and benefits may literally aid the feeling of well-being. This latter element surfaced in the recent literature on the economics of happiness, proclaiming that there is more to economic well-being than is being measured in GDP. Thus Aiginger (2005) demonstrates that the more equity-based social policies of the Scandinavian countries produce a population which gives itself a higher score in terms of happiness and life satisfaction than either the US or other European countries.

5.2.1.2 Social exclusion and living conditions in Amsterdam

In the city of Amsterdam 80% of the people is satisfied with his or her living conditions (Amsterdam O+S 2008, figure for 2004). This partly reflects the fact that, as was reported in chapter 1, the average income in the Amsterdam metropolitan area exceeds the national average. However, just as in other large cities, the city of Amsterdam has several neighborhoods with large concentrations of socially and economically disadvantaged people. Incomes in these neighborhoods are circa 10-15% lower than in the rest of the city, while the share of low-income households is markedly higher: in 9 of the 15 city boroughs more than 30% of the households belongs to this category (Amsterdam O+S, 2008, figure for 2008). The unemployment rates in the disadvantaged boroughs exceed the Amsterdam average by 2 to 2.5%-points, while the unemployment rate among non-Western foreign Dutch nationals exceeds the average unemployment rate by 5%-points in every borough of the city, pointing to a strongly polarized regional labor market. Culturally spoken, the disadvantaged Amsterdam neighborhoods are characterized by a large share of non-Western foreign Dutch nationals, which commonly exceeds 50% compared to 34% in the city of Amsterdam as a whole (Aalders et al., 2008: 17).

In addition, the inhabitants of the major Dutch cities are on average less healthy than in other parts of the country (Ritsema van Eck et al. 2006, p. 490). The differences in life style are an important explanation for this difference, but pollution is also a factor. In the Amsterdam metropolitan region air pollution emerges as a problem with negative effects on health. Fine dust (PM_{10}) and ozone (O_3) are the most import pollutants in Amsterdam, causing a wide range of health problems. It is estimated that the health damage due to the concentration of PM_{10} in the four major cities of the Netherlands amounts to 10.000 DALYs (Disability Adjusted Life Years) per million inhabitants (Ritsema van Eck et al. 2006, p. 493).

5.2.1.3 The contribution of HEIs

The social issues in the metropolitan area are the working field of an extensive line of social workers, civil services, mental and health care workers and volunteers. The HEIs contribute to their work in several ways. In the first place, HEIs contribute to social development by providing services to the inhabitants of the metropolitan region. Health care is the most important example in this category. Secondly, HEIs provide education and training of present and future workers in the social services sector. We mostly ignore this role in the present chapter as it concerns human capital formation and is therefore discussed in chapter 4. The third role concerns the production and dissemination of scientific knowledge in the domain of social policies. In fourth place, the HEIs offer physical infrastructure and other facilities to further social development. Finally, the role of students should be considered. Their volunteering activities often enable community services with specific social objectives. We shall address these social roles in the subsequent sections respectively.

5.2.2 Health care and social services provision

The most important service in the social domain of the HEIs in the Amsterdam region concerns health care. The two universities both operate an academic hospital and medical center which jointly employ a staff of 11,000 fte. Together the hospitals VUmc and AMC operated 1,735 beds in 2008, facilitating the medical treatment of 51,423 patients through admission and 664,712 patients in specialist medical units. The volume of the services provided indicate that the scope of both academic hospitals is national rather than regional.

In addition, VU and UvA jointly operate ACTA, the Amsterdam teaching center for dental surgery. This institute employs a staff of 500 fte and in 2008 treated 27,000 patients, generating an annual turnover of EUR 5 million. Specifically for the student population both universities offer mental health care services and a student medical center, but these facilities are also open for non-student civilians. The UASs do not have separate facilities in the medical area. The students of HvA are allowed to make use of the facilities offered by the UvA.

It is estimated that circa 11 to 14% of all students in higher education suffer from illnesses and handicaps limiting their physical abilities. The VU runs a *Study and Career Center* which offers additional services and guidance to this group. The VU also offers religious support to its students in terms of a pastoral worker.

UvA supports *Stichting Pantar* and employs people from disadvantaged groups to provide them relevant working experience and a better position on the labor market. The UvA project *academisch geschoolde vluchtelingen* has the same objective, but is targeted at refugees with an academic background or university degree.

5.2.3 Production and dissemination of knowledge

The production and dissemination of knowledge is the core business of the HEIs and it is in this field that we find a second major contribution to social development in the Amsterdam metropolitan region. HvA has research programs specifically targeted at disadvantaged neighborhoods in Amsterdam (*Westelijke tuinsteden*). HvA also hosts a research center, the *Karthuizer*, which was founded with the aim to generate research programs directly focusing on the typical social problems of a city community. An example is the program *Youth Spot* which addresses the empowerment of youth in disadvantaged neighborhoods. Karthuizer also aims to strengthen social cohesion through cultural activities.

HvA and UvA work together in a number of programs directly aimed at the social problems of specific neighborhoods in Amsterdam. This is part of an action plan fostered by the city council as part of a national strategy to raise the living standards in the 40 most disadvantaged neighborhoods in the Netherlands (*Vogelaarwijken*, after the former minister of housing). A specific training program developed by HvA and UvA should prepare managers and other stakeholders to carry out the Amsterdam action plan for raising the social standards of the Amsterdam neighborhoods falling in this category (*Leergang Wijkaanpak*). HvA and UvA also cooperated in opening a string of neighborhood shops for education, research and talent development (*Buurtwinkels voor Onderwijs, Onderzoek en Talentontwikkeling, BOOT*). The first shop opened in October 2008 in *De Baarsjes*, which is the most densely populated neighborhood of Amsterdam with ethnically spoken a diverse population, high unemployment rates and a high share of low income households. HvA and UvA also list several examples of joint research commissioned by the city council. One of these projects concern the role of volunteers and professionals offering social services in a multicultural city like Amsterdam (*Op zoek naar weerkaatst plezier*)

The VU likewise develops research programs aimed at the social programs of the Amsterdam region like social cohesion and security. To this purpose it co-finances with the city council a chair in security issues and cooperates with the city's statistical department (*Amsterdam O+S*) to maintain a civilian monitor. A special facility is the VU Center for International Development (CIS). CIS has partners in Asia, Africa, Latin America and Eastern Europe and aims at making knowledge, experience and expertise accessible to institutions and individuals in developing countries and countries in transition, and by doing so, to contribute to national development processes in those countries. The institute offers expertise in the following areas:

- Development of education and training;
- Management and organizational of educational institutions;
- The use of ICT in teaching and research, management and organization;
- Management and conservation of natural resources in rural areas.

A final initiative that should be mentioned is hosted by several (social) housing associations, city boroughs and the HvA. It is called the City Academy (*Academie van de Stad*) which develops programs to tackle social problems at a neighborhood scale. The programs consist of research, but also initiate and support bottom-up initiatives by local organizations or citizens in a more hands-on approach.

5.2.4 Infrastructures and volunteering services

The physical infrastructure offered by HEIs in the Amsterdam region to foster social development is limited to several of the initiatives already mentioned, such as the Karthuizer research center which is also a platform for cultural activities, and BOOT, the neighborhood shops of HvA and UvA. HvA and UvA also cooperate with the city council in outreach projects, offering students the opportunity to learn 'on the job' in social programs. An example involves teaching programs to aid homeless youth in financial budgeting. The Amsterdam Center of Conflict Studies (ACS) also offers students volunteering jobs in fields associated with social conflict in a city environment.

5.3 Cultural development

5.3.1.1 Economic impact of the cultural complex

Cultural development is another area where the knife may cut both ways. On the one hand, culture has intrinsic value and is one of the defining characteristics of regional identity. On the other hand, cultural development is increasingly seen as part of the competitive framework of a region and a factor that may attract creative talent and new firms to the region. The cultural complex fosters creativity which through the work of Florida (2002, 2005) is nowadays seen as a basic driver of innovation and regional economic growth.

In the metropolitan region of Amsterdam cultural development plays a role in all three channels. First, there is an extensive offer of cultural activities in the Amsterdam region. Amsterdam alone houses 37 museums of various sorts; three concert halls for classical music amongst which the renowned *Concertgebouw*, three concert halls for popular music and 70 theaters staging 19,000 performances on a yearly base. And the number of cultural stages is rising fast. Gerritsen et al. (2008) has calculated that in the period 2005-2015 the number of seats in Amsterdam theaters and music halls will increase with 45% to a total of 88,000. Three-quarter of this increase is due to private investment, expanded capacity in the non-subsidized part of the cultural sector.

Secondly, this offer of cultural activities meets a rising demand. The community is becoming increasingly aware that culture is a competitive advantage to reckon with. The Amsterdam metropolitan area ranks itself in 5th place in a list of European city regions (PRES, 2009: 5). One of the determinants for this competitive ranking is the quality of living. On this ranking Amsterdam also scores a 5th place, after Zurich, Geneva, Frankfurt and Munich. The report from

Boston Consulting Group on the economic importance of global and European headquarters to the Amsterdam region likewise stresses quality of living and cultural life as key competitive factors (BCG, 2008).

Thirdly, the creative industry is one of the key economic clusters in the Amsterdam region. Chapter 3 discussed the economic characteristic of this sector, which now employs around 38,000 people, many of them starting entrepreneurs. For the North Wing of the Randstad the total number of jobs in the creative sector is 98,384. The economic growth of this sector has been spectacular, which an cumulative employment growth rate of 55% in the period 1996-2008. However, the sector is more of an employment machine than an earnings machine: the growth of value added in the sector is generally below the average growth rate of value added in the market sector (Amsterdam O+S, 2009).

5.3.1.2 The contribution of HEIs

The HEIs play an active part in the cultural complex of the Amsterdam metropolitan area. This done through their facilities for staging cultural activities. Most facilities are linked to UvA and HvA like CREA, a cultural organization for students offering exhibitions, theatre, concerts and courses. CREA exploits its own theatre. The VU likewise offers facilities for cultural education through the *Griffioen Cultural Center*. The VU *Exposorium* in the main building of the university organizes contemporary art exhibitions on a regular basis. The two universities also play a lively role in the public debate through lectures such as the *Spui 25 lezingen* of UvA (organized jointly with a major Dutch newspaper) and a range of *Studium Generale* lectures which are open to the general public.

UvA also hosts several museums like the Allard Pierson museum for Archeology and the special collections of the university library, which can be visited at the *Bibliotheca Rosenthaliana* and other libraries in the city. Special mentioning deserves the *Sweelinck orchestra* which is formed by students of all the Amsterdam HEIs and in fact is the oldest symphonic orchestra of the city. Otherwise there is little cooperation between the Amsterdam HEIs in the field cultural activities. The VU has its own symphonic orchestra (*VU Orkest*) which was founded in 1962 and is currently with circa 120 players one of largest amateur orchestras in the Netherlands, focusing on classical works from the late 19th century and 20th century period. We should also mention the INHolland orchestra for students of this hogeschool.

Probably the largest impact on cultural development of the HEIs in the Amsterdam region is through its core business, education. There are in Amsterdam three major higher education institutes for the cultural sector.

- The *Rietveld Academie* is an independent school for higher education with 950 students. The *Academie* specializes in visual arts and design in every conceivable direction. Around 160 part-time teachers work for the Academie most of whom are also working as independent artists or designers. This construction ensures a dynamic exchange of ideas and techniques between the educational system and the cultural sector itself.
- The *Amsterdamse hogeschool voor de kunsten* (AHK) is the largest HEI in the cultural sector. It consists of several faculties which themselves form separate schools. The total number of students in 2008 was 2,940.
    - *Conservatorium of Amsterdam* forms the faculty of music. Here 1,000 students specialize in classical music, popular music, jazz and opera.
    - The *Amsterdam Academy of Architecture* trains students to practice architecture, urban design and landscape architecture. The Master's Degree awarded by the Academy gives graduates direct entry to the Register of Architects. Study and work are combined in the course: half of the course consists of design education, the other half consists of acquiring work experience in a relevant part-time position.
    - The *Netherlands Film and Television Academy* (NFTA) offers training to prepare for the work in the various crew disciplines. Specialization is possible in fiction

directing, documentary directing, screen writing, editing, producing, sounddesign, cinematography, production design, and interactive multimedia/visual effects.
    - The *Reinwardt Academy* prepares students for a career in cultural heritage. It hosts about 500 students. Teachers are closely related to the working field; museums and other cultural heritage institutes. There is an advisory committee representing the working field, which advises on the curriculum.
    - De *Theatre school* is a faculty of the Amsterdam School of the Arts. It consists of three departments: Dance, Theatre and Theatre technology and production. The department of dance schools houses performing dancers, choreographers and dance teachers. The Theatre technology and production department has three courses: Theatre technology, Production and stage management and Scenography. Within the department of Theatre students are educated in theatre directors, actors, acting and cabaret, mime player or theatre teacher. The school has approximately 450 students and 250 teachers and employees
- The *Rijksakademie van Beeldende Kunsten* is a unique institution in the Netherlands. It offers a 'global *made in Holland*' platform through a research residency for artists. In 2007 57 artists were placed at the Rijksakademie. They were provided with residency, technical workshops, a centre for knowledge exchange and a platform for the presentation of their work. It also offers the Prix de Rome prize, a state prize for artists and architects under 35 year. In 2009 the prize celebrates its 200th birthday. The third task is the management of collections. Archiving, taking care of libraries and artists' collections generates knowledge on the development of artists and their artistic practice. This knowledge is made available to a broad and 'highly cultured' public. In 2007 the annual budget of the Rijksakademie was EUR 5.8 million, 85% of which is funded through a subsidy from the Ministry of Education and Culture. The remaining part of the budget is financed through a Trust fund and ad hoc fundraising.

All these schools are listed as UASs, but the humanities faculties of the universities maintain close contacts with the UASs in the cultural sector and so aid scientific research in this field.

5.3.1.3 Sports

Both VU and UvA and HvA jointly operate a sports center for their students. The centers offer a wide range of facilities from indoor sports to football and rowing. The facilities are open to the community at large and are not restricted to student use.

5.4 Environmental sustainability

5.4.1 Economic importance

The issue of environmental sustainability is like social and cultural development a janus-faced subject for HEIs in the sense that it embodies goals with an intrinsic value like a clean living environment, but also represents a trend with opportunities for economic development. This explains the emergence of sustainability on the regional innovation agenda's in Amsterdam as one of the promising economic sectors. However, a cluster of this kind deviates from other type of economic activities because there is no homogeneous product or service bearing the label sustainability. It is much more a heterogeneous set of activities linked by a common theme, sustainable development. This characteristic makes it difficult to speak of a cluster of interrelated economic activities, which explains the lack of statistical data measuring its economic size and development (see also Gemeente Amsterdam et al. 2008: 15).

This being said, a recent study commissioned by the City Community of Amsterdam and the Chamber of Commerce finds that approximately 1/3 of the firms in the Amsterdam metropolitan area is involved in one aspect or another of sustainable development. It is estimated that the economic volume of the sustainability cluster in this area measures EUR 33 billion per annum.

This would equal one quarter of the total regional economy (Gemeente Amsterdam et al., 2008: 23). The report identifies a list of 270 companies that can be considered forerunners in sustainable development. Surprisingly, the share of corporations in the sector 'education and research' is just a meager 3%, 'advice' another 11%. This would indicate that there is still a world to conquer for the Amsterdam HEIs in the field of sustainable development.

5.4.1.1 The role for scientific research

The HEIs are trying to open up this field, but their efforts are not well coordinated. The VU is a forerunner among the HEIs with its *Institute for Environmental Studies* (Instituut voor Milieuvraagstukken, IVM). This is the oldest environmental research institute in the Netherlands. Its purpose is to contribute to sustainable development and care for the environment through scientific research and teaching. The institute has repeatedly been evaluated as the best Dutch research group in this field. IVM's research community of about 100 scientists and support staff addresses challenging environmental problems and offers both pragmatic and innovative solutions. The VU also hosts a Climate Center, which started in 2007 and combines expertise in the area of climate change. The Centre for International Cooperation (CIS) of the VU specializes in management and conservation of natural resources in rural areas of the developing nations. Further the VU offers sustainability as part of many courses on bachelor and master level.

The UvA likewise has several focal points in research related to sustainable development. This concerns for example the law faculty with a specialization in environmental law (*Centrum voor milieurecht*). The Amsterdam Institute for metropolitan and International Development Studies also has many research themes related to sustainability. The UvA holding also hosts IVAM, a consultancy and research organization for sustainability. IVAM focuses on many areas of sustainable development like energy transition processes, sustainable urban development and clean processes for consumption and production. Further, there is cooperation between the science faculty of the UvA and the city community in developing urban ecology as a scientific theme. The faculty hosts many other research programs related to this topic such as water management and sustainable chemistry. Research supports a broad array of courses in sustainable topics. To cite one example, the Amsterdam business school offers research and education in sustainable management. UvA also offers a bachelor in Future Planet Studies.

Example: New Energy Docks

UvA and VU are both supporting New Energy Docks. This organization connects science with other stakeholders in the field of sustainable development such as several large firms in the region (Shell), the Kenniskring, the Amsterdamse Innovatiemotor and the city community. The aim is to support sustainable development through the exchange of knowledge, support for regional economic development and entrepreneurship. The latter goal is realized by means of an incubator. New Energy Docks is heavily involved in the urban development of the Northern IJ shore. It offers programs to support entrepreneurship in sustainable development in this specific neighborhood. It also provides knowledge to planning agencies and the social housing associations which are currently undertaken large scale housing renovations in this area. New Energy Docks aims to develop a new building for sustainable development initiatives which must become an icon for sustainability in terms of material use and energy efficiency.
New Energy Docks is a formal organization with an executive board and a board of overseers.
See www.newenergydocks.nl

5.4.1.2 Sustainability in the internal organization

All HEIs have special programs to support sustainable management in the internal organization. For the UvA this is a priority, both in research but also for its internal affairs. It aims to profile the university as a sustainable organization. This is achieved through distinct goals. The university has for example signed the third national convenant for energy-efficiency (MJA-3) which obliges

the university to improve its energy-performance with 30% for the periode 2005-2020. It also strives to reduce CO2 emissions with 40% in 2024 (benchmark: 1990) which is a more ambitious goal than the national environmental goals. HvA has signed the same covenant and obtains comparable goals. The VU also has stated specific objectives concerning energy-efficiency and aims for a place among the upper quartile of most sustainable Dutch universities.

5.5 Conclusion

The main conclusion of this chapter is that the HEIs in the Amsterdam metropolitan area form part of large and dynamic regional networks supporting social, cultural and sustainable development. The role for HEIs in these networks is often demand driven. This applies with special force to social and sustainability issues. There is also wide spread recognition that the importance of these sectors goes beyond their intrinsic benefits. They form an important part of the social fabric supporting the comparative advantage of the region.

Table 5-1: SWOT

Strengths	Weaknesses
- Strong social and cultural facilities in the region - A large offer of education in the cultural sector - Extensive research and education in sustainable development - Development of cooperation between HEIs in this field to exploit potential for innovation and sustainable development	- Structured information about economic impact of sustainability cluster - Little cooperation among HEIs concerning internal goals and processes for sustainability - Entrepreneurship in the creative sector
Opportunities	**Threats**
- Cultural complex a breeding soil for creative entrepreneurship - Contribution of strong cultural complex to comparative advantage of the region - Developing international demand for products and services in the field of sustainable development	- Skill biased growth fostering social problems

Strengths

One of the main strengths is the extensive offer of social and cultural facilities in the region. We have discussed several of these facilities and noted that in several field like theatres and concert halls the number of seats and performances is growing fast. The cultural complex is really one of the defining characteristics of Amsterdam as a global city. This identity generates a large turnover. It attracts many tourists to the city and makes Amsterdam an attractive living environment for students and researchers seeking employment at one the cities' HEIs.

Environmental sustainability is a strength in another sense. Sustainability touches the core business of a large group of firms in the metropolitan area and so has the potential of developing into a cluster of innovation. This development is supported by all stakeholders in the region. The HEIs are currently offering a large array of studies and research programs in the field of sustainable development.

Weakness

A weakness is the lack of structured information about sustainable development in the metropolitan area. For example, there is little known about the economic impact of the

sustainability cluster. This reduces the scope for targeted action by regional stakeholders interested in furthering the goal of sustainable development.

Concerning the position of HEIs in this field, joint projects like New Energy Docks are currently starting to emerge. However, there is little cooperation among the HEIs when it concerns sustainable development for their internal organizations.

A further weakness is entrepreneurship. Most entrepreneurs in the creative cluster are single person firms. This may point at a lack of entrepreneurship which is needed to expand a firm. For the sector to become a job generating machine, entrepreneurship must be strengthened.

Opportunities

Opportunities for the HEIs and the region abound in this field. The HEIs in the cultural complex have a large output in terms of graduates which form the breeding soil for new cultural and economic activity in the region. It will prove a challenge to fully exploit this potential. Here the knife may cut both ways. Entrepreneurship emerging from the creative sector may become an engine for innovation and job growth. The extensive cultural complex improves the attractiveness of the metropolitan area as a living environment and so improves the comparative advantage of the region in the world economy. Amsterdam seems well placed to become one of Richard Florida's 'global talent magnets' (Florida, 2005: 169). Finally, the world wide trend towards sustainability provides an opportunity for developing this sector as a new cluster with strong economic potential.

Threats

The main threat lies in the field of social development. Global competiveness fosters a process of skill-biased economic growth. This may cause a relative deterioration of the lower end of the labor market. The byproduct of this labor market effect may be mounting social problems in neighborhoods with a large concentration of economically disadvantaged groups. In the Amsterdam metropolitan area there are several of such neighborhoods.

6 CAPACITY BUILDING FOR REGIONAL COOPERATION

6.1 Introduction

This chapter discusses the regional engagement of HEIs and the networks that bond HEIs and other regional stakeholders together. Key issues that will be discussed in this chapter are:

- Formal and informal mechanisms that exist at HEIs to identify and act on regional needs;
- Communication and dialogue between HEIs and regional stakeholders;
- The impact of HEIs on the regional labor market;
- The lack of specific regional targets in HEIs' strategic decision making;
- Conflicts between HEIs' international ambitions and regional engagement.

Section 6.2 described the origin and governance of the HEIs participating in this review. Section 6.3 then focuses on the (regional) mechanisms in the Amsterdam metropolitan region that stimulate regional engagement of HEIs. Section 6.4 describes the mechanisms that promote communication and dialogue between HEIs and regional stakeholders. Section 6.4 discusses to what extent HEIs in the metropolitan region have collectively and/or individually undertaken an audit of their impacts on and links with the region. Section 6.6 describes the process of institutional capacity building for regional involvement for each HEI separately. Finally section 6.7 discusses to what extent HEIs' organizational culture is directed towards regional engagement.

6.2 Origin and governance of the HEIs in the Amsterdam metropolitan area

History
The origin of the VU University reflects the principle of freedom of educational choice in the Netherlands, which is anchored in Dutch constitutional law. Abraham Kuyper, Prime Minister of the Netherlands from 1901 to 1905, founded VU University Amsterdam in 1880. At first the university was only open to Reformed Christians and was entirely financed by their fund-raising efforts and donations. Since the 1960s, however, VU University Amsterdam has been open to everyone and funded in the same way as the other Dutch universities, although it still retains its tradition of Christian standards and values.

The historical development of the UvA reflects the involvement of the local community in building a regional infrastructure for higher education. The predecessor of the UvA, the *Athenaeum Illustre,* was founded in Amsterdam in 1632 to educate students in Trade and Philosophy. Lessons were generally given at the professors' homes, as the establishment was not yet a proper university. The Athenaeum remained a small institution until the nineteenth century, with no more than 250 students and eight teachers. The situation changed in 1877 when the Athenaeum Illustre became the (City) University of Amsterdam (UvA). The involvement of the city with the university ended in 1961when the UvA became a nationally governed university like all other universities in the Netherlands.

The historical roots of the HVA go back to the schools for professional education in Amsterdam such as the *Kweekschool voor machinisten* founded in 1878. Prior to 1955 these schools were not considered as part of the system of higher education (Van Bemmel 2006, p. 4). A government bill from this year first listed the universities of applied science as a form of higher education. Since 1963 they are part of the system of publicly funded higher eduction in the Netherlands. Later governmental policies supported the collaboration and integration of the separate UASs which led to the emergence of large educational institutes like HVA. Since the merger of 2004 HVA and UVA fall under the control of a joint executive board.

Hogeschool INHolland has a similar history. It is the product of the merger in 2003 between several UASs: the Hogeschool Haarlem, Hogeschool Alkmaar, Hogeschool Holland and Ichthus Hogeschool/Hogeschool Delft.

Governance structure
The HEIs in the Amsterdam region participating in this review are all publicly funded institutes operating under the WHW, the Dutch law for higher education and research. As a result, they more or less have the same governance structure. The central decision unit is the executive board, which is appointed by a supervisory board. Table 6-1 lists the members of the executive and supervisory boards of the 4 HEIs under review.

Table 6-1: Executive and supervisory boards of the Amsterdam HEIs

HEI	Executive board	Supervisory Board
Vrije Universiteit	R.M. Smit (president) Prof dr LM Bouter K. Rutten	Prof P Bouw (chair) Mrs A. de Widt-Nieuwenhuizen R. Willems A.H. Berg L. Bikker Prof dr F. Leijnse F.J. Paas A. Weijsenfeld
VU MC (Medical Center)	E.B. Mulder (president) Prof dr T.J.F. Savelkoul Prof dr W.A.B. Stalman W.M. van Ewijk	
University of Amsterdam and HVA	Dr. K. van der Toorn (president) Mrs prof dr D. van den Boom P.W. Doop Mrs. M. Zaanen	A. Baan Mrs. I. Brakman J.H.M. Lindenbergh Prof dr N.A.M. Urbanus (chair)
UVA AMC (Medical Center)	Mrs prof dr L. Gunning-Schepers (president) R.J.M. Hopstaken Prof dr M. Dzoljic Mrs dr M.E.A. Stouthard	Prof dr A.H.G. Rinnooy Kan Dr. K van den Toorn A. Baan R.W.F van Tets
INHolland	Dr G. Dales (president) L.N. Labruyère Mrs dr J. Snippe	K. Noordzij G. Haveman Mrs. E.J. Mulock Houwer Mrs. M.M. Nelisse P.J.W. Roorda J. van der Tak Mrs. S. van Walsum

However, there are also several noteworthy differences between the governance structures of the HEIs. Figure 6-1 represents the governance structure of the Vrije Universiteit. This part is part of an association with Hogeschool Windesheim, an UAS which has its main seat in Zwolle and offers education in several locations such as Utrecht and Lelystad. Formally, the VUmc is also part of this association. The three partners of this association have their own executive boards but a joint supervisory board. The members of this supervisory board are appointed by the members of the association VU-Windesheim.

The University of Amsterdam has a union with a different UAS, the HVA. The characteristic of this union is their joint executive board and supervisory board. UvA AMC is officially one of the faculties of the UvA but has a separate executive and supervisory board. The link with the university is formed by the membership of the chairmen of both the UvA executive board (Van der Toorn) and its supervisory board (Urbanus) in the supervisory board of UvA AMC. The members of both supervisory boards are appointed by the minster of education.

Figure 6-1: Organization chart Vrije Universiteit

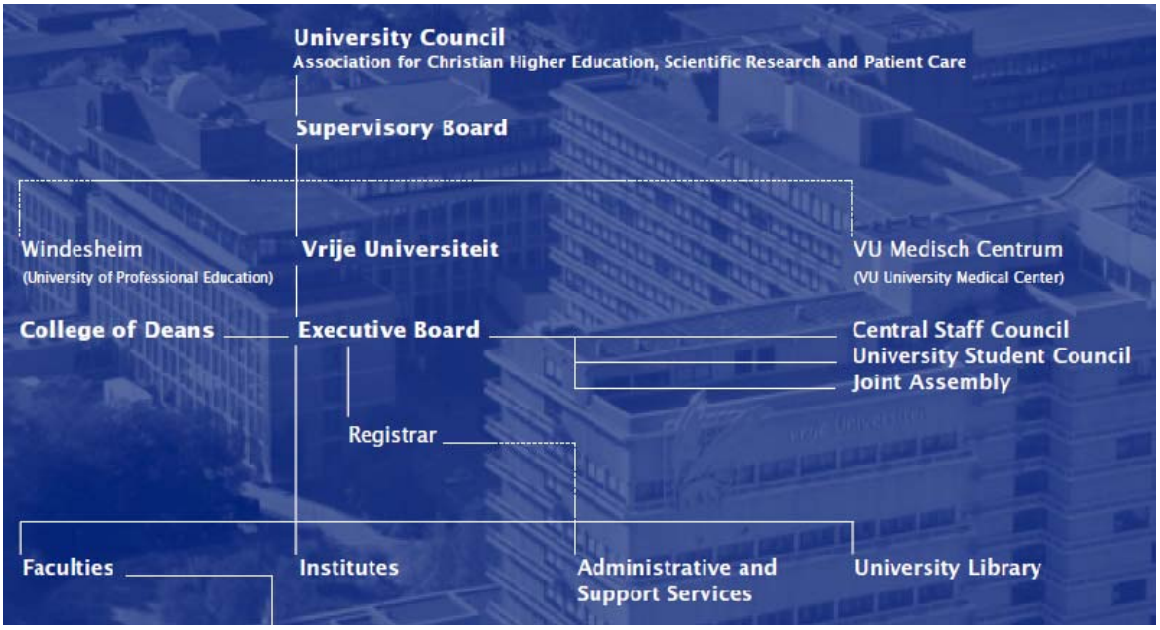
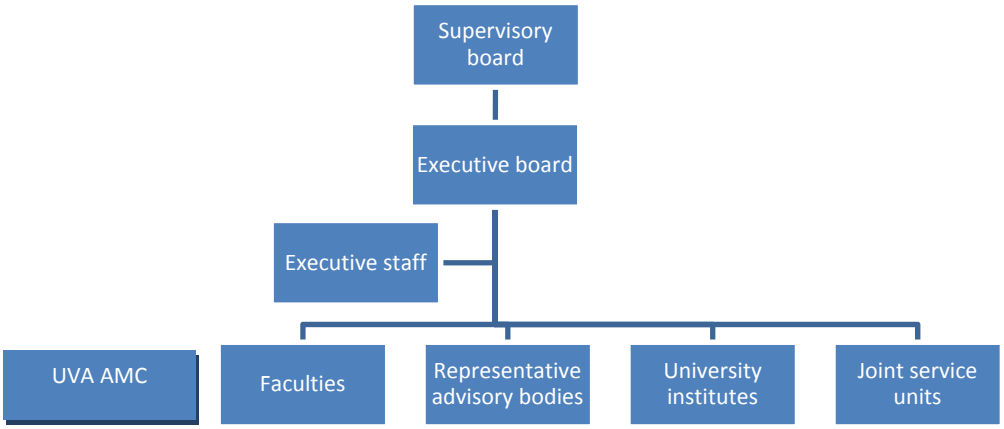


Figure 6-2: Organization chart University of Amsterdam

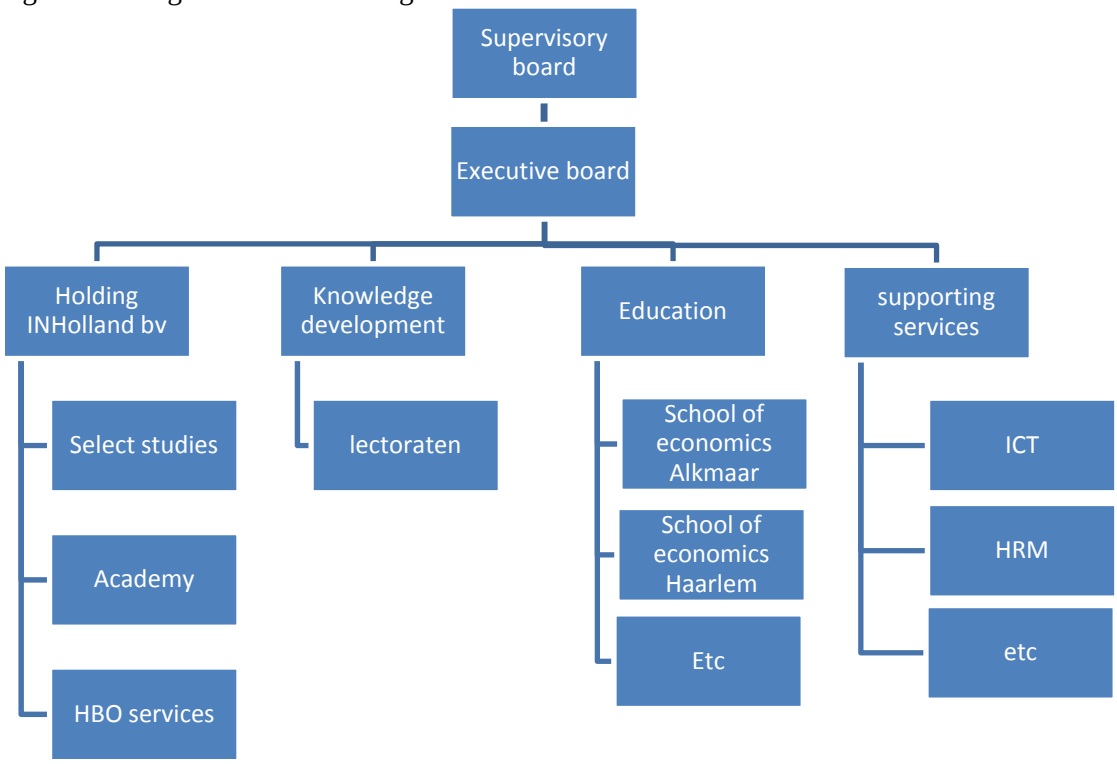


The organization charts of Hogeschool INHolland resembles the governance structure of UvA (Figure 6-3). The main difference concerns the faculties, which in the case of INHolland are called Schools. These schools are different institutes and are not organized according to subject but on the basis of their location. That is, the INHolland school of economics in Amsterdam is a separate organizational unit and stands apart from the INHolland schools of economics in respectively Rotterdam, Alkmaar, Haarlem and The Hague. INHolland also has a commercial unit, the INHolland Holding. This Holding controls the organization of all education which does not fall under the publicly financed system. Also INHolland Holding has a number of non-educational related commercial activities.

Like Hogeschool INHolland, HVA was made up of a large number of different institutes. Since 2008 these institutes have merged into a simples organizational structure on the basis of domains.

Like UvA with its 7 faculties, HVA now has 7 domains representing specific working fields, like technology, health, law and education.

Figure 6-3: Organization chart Hogeschool INHolland



6.3 Mechanisms to promote regional engagement of HEIs

6.3.1 Formal and informal mechanisms

Concerning the mechanisms to identify regional needs, a distinction should be made between the two universities and the UASs in the Amsterdam metropolitan area. For the universities there exist no formal external mechanisms to stimulate their regional engagement, but UvA and VU participate in many informal networks which allow them to play an active part in the region. The Kenniskring is one of these informal networks, which over the years proved a vehicle to start collaboration in many fields. An initiative already mentioned in other chapters is the *Amsterdamse Innovatie Motor* which focuses on the clustering of economic activities around specific themes like the life sciences. All the Amsterdam HEIs participate in the Kenniskring. Several other of the informal networks have been described in the previous chapters. The importance of such informal networks is that they help the HEIs to accommodate regional needs, because they bring together the HEIs and representatives of the local business community and the regional and local governments. The networks do not involve binding agreements to collaborate. Much initiatives emerge spontaneously, that is in a 'bottom – up' process which arises because the parties concerned recognize their joint interests.

UvA and HvA do have a formal internal agreement which directs their focus on regional engagement, since this goal is part of their mission. However, regional engagement is not translated into specific targets and is not subjected to a process of monitoring and evaluation. The merger of UvA and HvA is another formal agreement which helps the focus on regional engagement of, in this case, UvA.

There are also examples of more specific collaboration between one of the universities and specific UASs. An example is the collaboration between VU and INHolland to start a university study for teachers in primary education at the Haarlem location of INHolland. This study aims to boost the quality of primary school teachers and also aims to solve the regional and national labor market shortage for teachers by offering potential teachers a university degree. The *Platform Arbeidsmarkt en Onderwijs* PAO (Platform for the Labor market and Education) should focus more generally on the relationship between the educational system and the needs of the regional labor market. But the focus of this platform is more on the problems of the lower educated and it develops very few projects for HEIs. The VU is not even involved in PAO, which is also restricted to the working field of the city community of Amsterdam and does not include adjacent city communities.

In general, INHolland and HvA have internal mechanisms for the focus on regional needs which the universities lack. This concerns the *Beroepenveldcommissies* (Professional Field of Action Committee) which are used to focus the contents of their studies on the needs from the local business community. The universities lack similar mechanisms. They offer a different type of education, not directly focused on the needs of the (regional) labor market, but geared by the desire to foster the tradition of academic learning and to train researchers with specific scientific skills which are employed on a labor market which is national and global rather than regional.

6.3.2 Financial resources for regional engagement

In terms of financial resources, the national government is the most important contracting partner. Today none of the Amsterdam HEIs receives funding from regional governmental bodies for its primary tasks. Contract research is the most important channel through which regional funds enter the HEIs. The majority of the funds intended to foster regional ties between HEIs and other stakeholders is financed through regional economic development plans such as *Pieken in de Delta*. For the UASs the RAAK subsidies are a financial source which should be mentioned. The SKE-subsidies are a third example, because they promote the process of valorization. Generally, regional engagement is promoted in one of the following two ways. First, the government demands matching which requires the HEIs to look for investment partners, or, second, collaboration with other partners is a condition for receiving the grant in the first place.

Occasionally, the regional governments provide subsidies for education or research, but these subsidies are generally of a limited size. This does not apply to the involvement of the Amsterdam city community in several large and ambitious projects. In particular, *Amsterdam Topstad* financially supports the following projects:

- The Duisenberg School of Finance;
- The Amsterdam University College;
- The Science Park Amsterdam;
- Life Sciences Summer Business School;
- Amsterdam Centre for Service Innovation.

In addition, the regional governments commission contract research to both universities and UASs. The nature of this research generally considers specific regional problems of an economic or social nature. The precise extent of this kind of research is unkown. HVA receives several of such subsidies mostly in the domains of social policy and law, education and media and information. The subsidy-givers are the city community of Amsterdam, housing associations and welfare organizations. The smallest subsidy 7,500 EUR the largest 500,000 EUR for the ITS academy.A final channel that should be mentioned is the organization of events and fairs centered around specific themes like sustainability. Examples are *Amsterdam Duurzaam* (Sustainability in Amsterdam) which is supported by the city community Amsterdam, the local business community and Hogeschool INHolland.

Box 6-1: Sustainability in Amsterdam (*Amsterdam Duurzaam*)

This is a yearly event which in 2009 was organized for the third time. The event consists of several activities. There is a festival open to the public, showing new developments in sustainable development. The aim of this festival is part educational and part communication aiming to support sustainability as a public goal. The other part of the event consists of a conference which is intended for the exchange of lessons and good practices. The city community of Amsterdam is the host for this event, which is supported by a broad coalition of corporations, educational institutes and NGOs.

The resources for regional engagement flowing from these sources into the HEIs are not management in a separate way. National and regional financial resources are managed jointly and without reference to their particular sources. For the UASs the degree of decentralization is important. The directors of the separate schools (INHolland) or Domains (HvA) are responsible for the financial results of their unit and report directly to the executive board of the UAS. This means that the schools and domains have an incentive to actively search for additional funds for regional engagement in case such funds may help to boost their financial results. Likewise, for the universities additional funds of this kind provide extra revenue.

There are hardly any new regional funding streams for the HEIs emerging in the Netherlands. The reason for this is related to the absence of specific regional goals in national educational policy (see chapter 2). There are, however, some regional goals in innovation policy, but their importance is subordinated to the growing attention for *sleutelgebieden* (key scientific areas) in national innovation policy.

6.3.3 The role of the regional government

The city community in Amsterdam is currently developing a new economic strategy which includes a key role for higher education and research. The community recognizes the key role of the HEIs in promoting the transformation of the regional economy towards a knowledge-based services economy. In similar vein, the regional authorities forming the Amsterdam metropolitan area have drawn up an economic strategy which places the HEIs center stage (PRES, 2009). However, both strategies do not involve additional financial resources for the regional engagement of HEIs. The main instrument for the regional authorities is intermediation; building bridges between the key players in the regional innovation system. The lack of financial instrumentation on a regional level explains why there are no processes in place to regularly review current engagement arrangements between the HEIs and the region or to identify good practices in this field. There are however several ad hoc studies into this relationship. From 2007 to 2009 Erik Gerritsen was the city's 'knowledge ambassador' with the explicit task to improve the collaboration between the city community and the two Amsterdam universities. He has compiled a review of the different forms of cooperation between knowledge and educational institutions and other stakeholders like the city community and the local business community (Gerritsen, 2008). Another example, is the study by Smit (2009) examining the relationships between SMEs and UASs in the Amsterdam metropolitan area. The conclusion of Smit is that SMEs still experience difficulties in finding the right partners within the UASs. Cooperation can therefore be improved in several areas (see Box 6-2). Finally, the Chamber of Commerce is currently reviewing the complexity of the governance structure in the regional innovation system and has asked McKinsey & Company to carry out this study.

Box 6-2: Obstacles for collaboration between SMEs and UASs

Smit (2009) stresses a paradoxical element in the ties between SMEs and UASs. On the hand, the graduates of UASs increasingly find employment in a SME firm. Research indicates that in 2007 50% of all graduates from UASs found a job in a SME firm; in 1995 this applied to 19% of the graduates. But on the other hand just 2% of all SME firms has a direct working relationship with an UAS. This causes an asymmetry in the knowledge transfer between UASs and SMEs. Knowledge generally flows from the UASs to the firms through projects done by students within the firm like research and development. But the reverse way is certainly underutilized. The factors hindering the SMEs in maintaining more frequent and effective working relationships with the UAS sector are as follows:

- The organizational structure of UASs does not correspond to the economic logic of the business community (schools are organized around educational themes like the Domain Technology at HvA rather than specific economic sectors like Transport). This hinders firms in swiftly finding the right contact person.
- Communication with the outside world is not centralized at UASs. Inquiring entrepreneurs receive bits of information from different persons. Specific contact points for SME entrepreneurs must solve this problem. INHolland has opened 5 of such points in the Amsterdam region. Kennispoort is another institution with the explicit aim to help firms find their way in the knowledge system.
- The final problem is that there are perhaps too many intermediary structures trying to tie SME-firms and educational institutions. The entrepreneur is faced with multiple organizations all offering their help. This makes it difficult to assess which organization to turn to for what question.

6.4 Promoting regional dialogue and joint marketing initiatives

In the Amsterdam metropolitan area personal ties are the all important ingredient of regional dialogue. Most parties concerned like the HEIs, the regional governments and the local business community recognize their joint interests in building a strong and dynamic knowledge network in the region. But what makes the different actors realize this confluence is personal communication. The Amsterdam region lacks a strong centralized governing body which may establish collaboration top-down. Most initiatives emerge bottom-up through the aforementioned personal communication channels. This explains the importance of institutions like the Kenniskring as a linking pin in the regional knowledge system. The Kenniskring does not formulate a joint strategy or common agenda, but does offer a platform for the exchange of ideas and developing personal ties between key players. This provides the fuel for increased dialogue and joint initiatives in many directions.

The importance of personal communication is reflected in the representation of HEI-staff in public and private bodies in the region. The chairmen of all HEIs in Amsterdam are member of the governing board of the Kenniskring. Director Jeroen Knigge of HvA participates in the governing board of PAO Amsterdam. Another example is Rene Smit, chairman of VU Amsterdam who is strongly involved in several private-public organizations like New Energy Docks, the Innovation Platform, Randstad 2040 and Amsterdam Partners, the public-private platform which aims to improve the city marketing of Amsterdam.

The Netherlands has a long tradition in corporatism. The benefit of this tradition is that all relevant groups in the public and private arena are somehow represented in the different forums for regional dialogue. The Kenniskring is a good example of a platform with participation of many individual firms, governmental organizations and knowledge institutes. The regional governments have joined forces in the Amsterdam metropolitan area, which is a public organ and does not include membership from private organizations. A notable lacuna in the bodies for regional dialogue is the representation from labor unions. Human capital is a key factor in the

knowledge society, but except for the educational institutes it is not represented in regional dialogue. The reason for this is that the unions find their partners and opponents on a different level, namely the national bodies for consultation such as the Social and Economic Council and the Foundation for Labor.

However, dialogue in the Amsterdam metropolitan area does not directly lead to the joining of forces in terms of human and financial resources. The HEIs have virtually no joint resources for the preparation and implementation of urban and regional strategies. The joint international marketing of Amsterdam through the website www.studyamsterdam.nl is the most advanced case of a joint marketing initiative. There are many other cases of collaboration between HEIs, some of them even in very extensive forms like the merger between HvA and UvA and the joint initiatives AGSS and ACE of VU and UvA. But such joint initiatives are never exclusively motivated by an urban or regional strategy. In contrast, the focus is global rather than regional. The joint initiatives are important instruments for allowing the HEIs to compete in the international market for higher education and research. The region profits from this international competition through increased knowledge transfers and possible entrepreneurial spin-offs. There is certainly a reverse side in that a strong knowledge base in the region allows the HEIs to compete more successfully. The motto of the newly founded Amsterdam University College is a case in point: *Excellence and diversity in a global city*. This is the banner which should attract students from all over the globe to study in Amsterdam.

A joint marketing initiative that should be mentioned is *Amsterdam Partners* (www.amsterdampartners.nl). The mission of this foundation is to improve the competitive position of Amsterdam in the world economy through city marketing. (The current catch phrase for marketing initiatives is *I AMsterdam*). To this purpose the foundation was set up in 2004 as a platform for regional governments, industry and other stakeholders. All the Amsterdam HEIs, UvA, HvA, VU and INHolland, are partners in Amsterdam Partners. It is further supported by regional city communities in the Amsterdam metropolitan area like Haarlemmermeer, Zaandam, Amstelveen, Haarlem, the province Noord-Holland and Almere, as well as a long list of corporations.

In general there is no direct governing role for external organizations in the management of the HEIs. The autonomy of the HEIs is one of the pillars of higher educational policy in the Netherlands. The most important external factor for the management of HEIs is the Ministry of Education and Science and its regulations. The regulations place the managerial freedom for HEIs within strict bounds in order to safeguard the public interest of high quality and accessible higher education. For example, the HEIs are not allowed to start new studies without an explicit check and accord by a governmental committee. The UASs are confronted with an additional obstacle in expanding their scope or domain. They are only licensed to operate in a specific region and are not allowed to develop interregional activities.

‘Buy local’ purchasing programs within HEIs do not exist in the Amsterdam metropolitan area.

6.5 Evaluating and mapping the impact of the regional higher education system

The HEIs in the Amsterdam region have never collectively undertaken an audit of their impacts on and links with the region. The two universities cooperate with the VSNU to monitor the labor market performance of their graduates. Hogeschool INHolland and HvA have examined the labor market for their graduates in individual studies, as well in cooperation with the national monitor of the HBO-Raad. The School of Economics of INHolland has made a joint study with the local business community of labor market developments for the period 2008-2015. The study investigated the supply side of the higher education market, the growth in the number of students as a well as the changes in the demand for graduates with higher education. INHolland aimed to reduce some of the predicted shortages for the midterm by adjusting its educational supply. But

beyond labor market studies, there are no examples of economic impact studies by the HEIs, nor of their contribution to social and cultural development.

6.6 Institutional capacity building for regional involvement

Due to their merger UvA and HvA have a joint mission. This mission specifically mentions regional engagement as a target. The VU has formulated a specific regional mission explicitly targeted at the development of the *Zuidas* (Southern Axis), which is the city's largest business district and the location of many international corporate headquarters (VU, 2008: 8 and 15). The VU is working together with Hogeschool INHolland and the city community to relocate its activities in this area of the city in the most optimal way in order to further the development of the *Zuidas*. Hogeschool INHollland is the VU's strategic partner in the development of a 'knowledge district' which matches the business interests of this city area. The impact of the VU in the larger Amsterdam area is given shape through collaboration with the other Amsterdam HEI's like UvA, HvA and INHolland.

Box 6-3: 'Univercity' at the Zuidas

The VU has recently signed an agreement with the city community to develop new research facilities for its life sciences and natural science faculties in the area. The new building should host both research and educational facilities, office space and 2,000 houses. The aim is to create a 'univercity' which combines science, business, culture, recreation and living space. Construction is expected to start in 2012.

Source: press release

In none of the HEIs has the structure of management been radically altered in order to engage with regional needs. Generally tasks related to the operation of HEIs in the region are allocated to different members of the board of governors. HEIs like the VU have appointed specific policy officers with the explicit task to establish closer ties with all the relevant stakeholders in the region and to represent the HEI in the several bodies for regional dialogue like the Kenniskring.

The lack of specific regional targets for VU and INHolland also means that funds and people are not explicitly allocated to regional tasks. Such tasks are not specifically registrated in the financial administration but belong to the going concern of the internal organization. At UvA and HvA regional engagement is listed as part of the mission, but this objective is not translated into specific targets as part of a planning and control cycle. Funds for regional engagement are likewise not separately registrated. For all HEIs there is a financial budgeting system which does not differentiate between regional and other types of funds.

6.7 Creating a new organizational culture

Internationalization is high on the agenda of the HEIs in the Amsterdam metropolitan area. UvA has specific goals for its position on the Times HE and Shanghai rankings which are translated into internal targets for improving the scientific quality of its research. The targets are subject of agreements between the university faculties and the board of governors. VU values the Leiden (CWTS) ranking most because it adopts a measurable standard of comparison, the impact of scientific publications. Currently the VU is positioned fourth on this ranking among Dutch universities and 15th among European universities. According to the VU, the Times HE-ranking and the Shanghai ranking is based on the subjective judgment of peers. Its strategic agenda says that the VU aims to become one of Europe's twenty best research universities (VU, 2007: 8).

HvA and INHolland also do not have specific targets related to international rankings. They do aim to attract a larger number of international students to their schools and actively seek cooperation with foreign partners for this goal. HvA says it focuses on becoming the best UAS

among comparable institutions in the Netherlands and so has a national rather than an international focus for its strategy.

When it comes to using a specific institution as a benchmark, Hogeschool INHolland refers to the London Southbank University (LSBU). LSBU is comparable to INHolland in terms of the number of students and its educational focus. Several schools of INHolland maintain close working relationships with LSBU. For example, the School of Health of INHolland has listed specific ambitions concerning its working relationship with LSBU such as increasing student and teacher exchanges, developing joint minor studies and developing joint research and educational programs for the European Commission. This collaboration has resulted in several specific results such a joint master program Medical Imaging and Radiation Oncology.

All HEIs recognize the potential tension between increased internationalization and regional engagement. However, they either consider this tension a normal element of their business process or do not find it an obstacle large enough to prevent them from delivering world class achievements in both fields.

7 CONCLUSIONS: MOVING BEYOND THE SELF-EVALUATION

7.1 Introduction

In the distant past Amsterdam used to be one of the main trading cities of the world, a position favored by its geographical position and the entrepreneurship of its inhabitants. Nowadays geography is still an important competitive factor for the Amsterdam metropolitan area but less so than it used to be. In the global economy of today the future is to 'smart cities'. These are metropolitan areas succeeding in gaining a competitive advantage by fully exploiting their potential for knowledge and innovation. In moving beyond this self-evaluation the question emerges whether the Amsterdam metropolitan area can become one of these smart cities. It certainly has much potential if we view the quality and diversity of its educational and research institutes. But it has not yet reached the frontier of most competitive smart cities in the world. The ambition is there. The regional authorities working together in the Amsterdam metropolitan area aim for a position in the top 6 of the Global Business Gateways in the world. What remains is a plan of action to match the ambition.
This final chapter reviews the elements which may form part of this plan of action. It starts by assessing the strengths of the region, the points indicating that the quality and diversity of the Amsterdam HEIs is already exploited to support innovation as a key economic driver. It then continues by discussing the region's most important weak points. The final section closes with a view into the future. How can the HEI-sector be used more effectively in supporting the transformation from an industrial economy towards a knowledge-based services economy? What are the actions needed to bring the Amsterdam metropolitan area closer to the competitive frontier? We use two scenario's, called global competition and regional communities, to answer these questions.

7.2 The contribution of HEIs to city and regional development

A region in transformation..

Reviewing the critical success factors for city and regional development is not an easy task. This report has described a great variety of projects and initiatives allowing HEIs to contribute to city and regional development. In the Amsterdam metropolitan area they prove important drivers of productive capital and technological growth, which is shown by the above average share of higher educated workers in the labor population. They are also the catalysts for network building which allows social capital to develop and add critical mass to the quantity of creative capital which is becoming a major source of entrepreneurship and innovation in the Amsterdam region. The picture which emerges is that of an economic system in transition. The waves of global capitalism gradually pull Amsterdam from its industrial roots and push it further and further in the direction of a services economy in which knowledge skills are key. The HEIs in the region are the facilitators of this process.

…and the key drivers for success

The HEIs cannot perform this task alone. They are nodes in a dynamic chain of regional stakeholders together forming the regional innovation system. The critical success factors in establishing this system are of a diverse nature. A *first* and very important factor is the shared sense of urgency. All parties concerned recognize the need for increased cooperation as a means to improve innovation as an economic engine for the region. The HEIs play their part in this process by offering world class education and research. They also increasingly aim to match their offer of knowledge and skills to the demand from the region, which has resulted in joint structures for consultation such as the Kenniskring and the establishment of clustered activities in new and dynamic economic hotspots like the life sciences and the creative industry. The business

community and the regional public authorities likewise recognize that the economic future of the region crucially depends on the region's ability to step up investment in innovation and R&D. The *second* critical success factor is the match between such innovation coalitions and the competitive strengths of the region. The extensive health care sector with two university hospitals provide a fertile soil for the Life Sciences cluster. Likewise the logistics sector plays upon comparative regional advantages, such as the presence of the Amsterdam harbor and Schiphol, a major international air hub. The same applies to the creative industry, which can only thrive because of the extensive offer of cultural facilities and education in the region. In the Amsterdam metropolitan area the interaction of productive and creative capital is a major driver for social and economic development. A further example concern leisure and tourism, an import economic sector in Amsterdam and one of the focal points in the educational program of Hogeschool INHolland, which so contributes to better knowledge, skills and innovation in this sector.

Finally, the lack of a central governing force can be mentioned which has resulted in multiple innovative initiatives in many different directions. This has allowed the region to swiftly react to new opportunities when they arise.

Coalition building for innovation…

The regional innovation system described in this report hosts different forms of collaboration. *First*, the HEIs determine their own research agenda and educational program. The specific priorities of these agenda's are the province of the individual institutions and are connected to their mission. HvA and UvA are examples of this approach. They explicitly include contribution to regional development among their strategic goals and their research and educational priorities reflect this objective. However, the execution of these research agenda's is increasingly done in cooperation with regional partners. The development of joint research schools like the Tinbergen Institute is on the agenda for at least the past 20 years. Of more recent date is the effort to broaden the coalition supporting such initiatives as a means to increase its social and economic impact. The Duisenberg School of Finance is an example of this, hosted by both universities with support by the Dutch central bank, commercial banks and the city community. The Amsterdam University College, which opens its doors this fall, is likewise supported by both universities, the city and the national government. The Amsterdam BioMed cluster is an example of a successful joining of forces in the medical sector with the Life Science Center Amsterdam and the Life Science Fonds Amsterdam as two of its major products.

The *second* level where coalition formation is on the rise concerns the regional government. The conception of the Amsterdam metropolitan area is testimony of this development as a governing board of almost 40 different regional governments. PRES (2009) demonstrates that these regional governments recognize that their economic development is strongly intertwined and that cooperation is needed to strengthen their mutual positions. The result is an economic agenda with specific targets for action, like the selection of key economic sectors.

We have seen that, *thirdly*, the business community is likewise assessing its comparative advantage which resulted in a regional innovation strategy from the Chamber of Commerce (KVK, 2008). Further corporations from the region partake in several of the bodies for regional dialogue such as the Kenniskring and financially initiatives which aim to strengthen the knowledge base in the region and its competitive position such as the Duisenberg School of Finance.

These different coalitions indicate that all regional stakeholders recognize the importance of the knowledge sector and hence the HEIs as a key economic variable for future economic development. The next step in this process is improved coordination of these different agenda's as a means to ensure their effectiveness.

…requires different forms of cooperation

Cooperation between these different parties is already taking place and demonstrates which approaches work and which not. As a *network organization* the Kenniskring Amsterdam is of vital importance in establishing ties between all parties concerned on a personal level. It helps to isolate shared strategic objectives, but the follow-up on these issues is subsequently left to the initiative of the members themselves. If coalitions arise from the Kenniskring, they are thus formed in a bottom-up manner. The importance of the Kenniskring is that it forms the broadest coalition discussing and promoting the contribution of HEIs to innovation in the Amsterdam metropolitan area.

High on the agenda of all parties is the need to better match the regional supply of knowledge and skills with the demand. This report discussed several initiatives aiming to improve this connection such as Kennispoort, which operates as a shared front office of the HEIs to the business community concerning matters of innovation. The valorization process is further supported by the *Amsterdamse Innovatiemotor* which stimulates economic activity around an array of selected innovative clusters like the creative industry and life sciences. *Creative Cities Amsterdam Area* aims to achieve the same goal. The VU and UvA TTOs are a next example of relatively young institutional structures designed to better match the supply and demand for scientific knowledge and technology. Of specific importance is the foundation of the *Science Park Amsterdam*, a joint project of UvA, NWO and the city community. There are several other examples of coalition building by individual HEIs showing how they link their research and educational activities with specific demand from the regional community. In this regard the *Zuidas Law Academy* established by the VU can be mentioned, just as its participation in *Amsterdam Bright City*.

Box 7-1: Amsterdam Bright City

Amsterdam Bright City is another initiative which responds to the development of the Zuidas, a business district in the Southern part of the city, as one of the global gateways to the city. The economic importance of the Zuidas is that it is home to the headquarters of many multinational corporations. Yet it also resides close to the VU, sits on a crossroad of different transport and road infrastructures and is not far from the city center. The combination of these qualities makes it the center of the developing services economy in the Amsterdam area. Amsterdam Bright City is one of the new initiatives aiming to exploit the potentials of this center to the full. It is supported by corporations situated at the Zuidas and adjacent areas, the city community and VU and VUmc. It offers a meeting place for entrepreneurs, employees, expats, scientists and students working in this area. It offers courses, debating sessions and other activities in a diverse range of subjects such as innovation, sustainability, economy but also philosophy and culture. Amsterdam Bright City forms a university college and a structure for community building at the same time.
Source: www.amsterdambrightcity.nl

Which incentives?

What works in establishing cooperation for innovation and what not? The projects discussed in this self-evaluation report indicate that there exists no blue print for successful cooperation. The agenda's and projects boosting the contribution of the HEIs to regional development are mostly of a bottom-up nature. There is not much centrally organized governance of this process. The business sector generally engages in such coalition formation because they recognize the commercial value added of a well-developed regional higher education system. When they cooperate in specific projects it is because they are expecting increased innovation and hence higher profits, but also participate in projects because they recognize the added value of a strong and dynamic business environment in the Amsterdam area. The HEIs themselves do not enter such agreements in a similarly commercial spirit. They seek cooperation in order to boost scientific achievement and to increase the social relevance of their research. For them direct financial gain is not one of the main drivers and conflicts with the nature of the HEIs as institutions largely financed by public resources. This sometimes causes a conflict with potential

coalition partners in the business community. This occurs when the demand from the region does not allow the HEI to generate products with the required scientific standard. In this case the incentives on both sides of the market do not dovetail leading to a mismatch between the supply of and demand for knowledge.

However, even when incentives are perfectly aligned the equilibrium of supply and demand for knowledge would reside at a suboptimal level when viewed from a social perspective. The reason for this social disequilibrium is the existence of external effects which may have a positive value for society such as general health and employment effects but do not represent private gains which are included in the cost-benefit calculus of investors. In other words, there are social benefits which are 'lost' in the market place; the market fails from a social perspective. In public goods theory this forms a cause for the government to interfere and to boost the volume of investment in knowledge through stimulating measures like a subsidy to lower the costs of R&D-investment. We have seen in this report that in the Netherlands such measures are the province of the national government. The HEIs in the Amsterdam region hardly receive financial means for innovation from regional governments. Generally innovation programs like *Amsterdam Topstad* are on their turn at least partly financed by national funds for regional economic development, like *Pieken in de Delta*. Although there are a few cases in Amsterdam which do involve a direct financial commitment from the city community, such as *Amsterdam University College*, the *Science Park Amsterdam* and the *Life Science Fonds Amsterdam*.

The role of the city community in Amsterdam is first and foremost that of a catalyst. It tries to build bridges between the different partners in the region – between the HEIs among themselves and between the HEIs and the business community – as a means to improve the climate for innovation. The community also tries to attract new knowledge institutes to the region and to create an attractive investment climate for investing firms, especially those working in key economic clusters such as the life sciences and the creative industry. The city community also recognizes the importance of the interaction between an attractive living environment and the investment climate. City promotion must raise the region's image as a knowledge hub and stimulate the influx of R&D-investment and knowledge workers.

Contribution to the labor market and social well-being

Coalition building in the labor market takes place on a different footing. The UASs in the region actively seek cooperation with the business community in order to monitor the demand for the skills of their graduates. This awareness of the link between education and the needs of the labor market is much less developed among the two universities. One of them explicitly states that "solving labor market shortages is not one of our tasks". The universities offer their students skills and competences which first and foremost meet academic standards, although they must allow graduates to compete on the labor market. When we examine the labor market statistics they succeed admirably in this task. The unemployment rate of workers with higher education in the Amsterdam region is very low and far lower than the unemployment rate of workers with lower types of education. The labor market is not a problem that should concern the HEIs.

Or is it? There are at least three reasons to argue that the HEIs should be engaged in labor market coalitions. *First*, in the past decades the participation in higher education has been expanding rapidly. This has resulted in a rapid growth of the share of higher educated in the labor population which in the Amsterdam area is almost 40%. This seems high, but it is not high enough. Skill-biased economic growth causes an even more rapid increase in the demand for higher educated workers resulting in a rising skill premium (Jacobs, 2004; Nahuis and de Groot, 2003). In order to facilitate this rising demand the HEIs need to attract more students, which means finding them in groups which are now underrepresented in higher education such as the non-Western foreign Dutch nationals. The growing participation rate of these students in higher education, especially at UASs such as INHolland, indicates that they are indeed trying to achieve this task. The *second* reason for HEIs to actively monitor the labor market is the emerging need for life-long learning. Workers with qualifications at secondary levels increasingly experience the need to get a degree

at higher levels in order to maintain their competitive position in the labor market. This opens up the market for post-secondary schooling in which the HEIs participate and often find a profitable outlet. Finally, the *third* reason is a social one. Research points to the risk of a divided labor market with rising skill premiums for the higher educated, but lagging wage rates and rising unemployment rates for the lower educated. This distortion in the labor market is likely to have social repercussions, especially in city neighborhoods with a concentration of economically disadvantaged groups. Education is the best recipe to counter the risk of social exclusion and instability and it speaks for itself that the HEIs have a task in building effective regional learning systems, enabling students to optimally exploit their talents.

Cultural and sustainable development

There is a large cultural sector in the Amsterdam region which is still expanding. This report has shown that higher education is a dynamic factor in this scene. The general HEIs foster all kind of cultural activities, fulfilling a demand from students as well as from society at large. More importantly, the specialized HEIs directly produce creative capital, providing education and training in many different fields of the arts. They thereby provide a new supply of workers for the labor market in the cultural sector in the region and beyond, and give impetus to the developing creative industry.

Sustainable development is penetrating the educational programs of both the beta and the gamma disciplines. In research the HEIs host several major research institutes such as the IVM at the VU. The HEIs also try to position themselves as exemplary institutions, promoting sustainable objectives such as a 40% reduction of CO2 emissions in 2025, which are more ambitious than the official targets from the Dutch government. Sustainability is a good example of a research priority among HEIs which meets the needs from the local community which likewise considers sustainability a new spearhead of economic activity.

7.3 The challenges for regional cooperation

The contribution of HEIs to city and regional development is not a static image. It develops over time and is hence fostered by learning processes. This section summarizes the lessons for improvement.

The *first* challenge is to give all the initiatives for increased innovation which are currently blossoming in the Amsterdam region sufficient ‘focus and mass’. Without these qualities the now emerging clusters will fail to generate the added value to the regional economy which is expected from them. The ICT and Life Sciences clusters are probably farthest in achieving this aim, but for the sustainable development cluster this is unsure. The challenge facing the partners in the Amsterdam region is to focus more clearly on what they want to achieve as a common goal. This starts with a common agenda instead of the three or four separate innovation strategies which currently dominate the scene. The bottom-up approach has greatly worked in getting many innovation coalitions off the ground. In the next phase of development it may be time for a turn to a more top-down approach of public leadership (including the HEIs) for making the coalitions more effective. There is for example room for improved coordination among the HEIs concerning their goals for achieving sustainable development.

The *second* challenge concerns a precondition for reaching focus and mass: the region needs to attract more R&D-investment. There is a lot of first class scientific research in the region, but this abundance somehow does not materialize in high R&D-investment in the business sector in the Amsterdam metropolitan area. This indicates that the relationships between the HEI-sector and the business community need to be tightened. This is partly a matter of making the research agenda of the HEIs more demand driven. The traditional view of HEIs is developing research programs on the basis of their own scientific strengths and interests and the national research funding mechanism hardly forces them to change tactics and focus more clearly on community needs. Recently founded facilities like the TTOs, the Science Park Amsterdam and colloborate

initiatives like the Amsterdam BioMed cluster and the Duisenberg School of Finance indicate that the HEIs are working to achieve a turnaround. But more is needed to boost innovative capacity as a general quality of the region.

The reverse side of this coin is that the business community in the Amsterdam area needs to operate more proactive when it comes to finding the right knowledge partner for innovation. The Amsterdam HEIs have much to offer in terms of knowledge and skills and the local business community needs to be much more aware of the added value of collaboration. There are new institutions in place such as *Kennispoort Amsterdam* which forms an interface between the knowledge institutions and the corporate sector. This may improve the access for firms to the knowledge base at HEIs. But such initiatives will fail to have impact when businesses do not in first instance feel the urge and necessity to innovate their production processes and product lines and seek assistance from the HEIs to do so. It is here that the corporate sector in the Amsterdam metropolitan area can make more progress than is currently the case.

A related objective is to increase the importation of R&D-investment which is clearly underdeveloped in the Amsterdam region. Apparently potential foreign investors are unaware of the comparative strength of the knowledge base in the Amsterdam region. The international reputation of Amsterdam is insufficiently associated with excellence and diversity in knowledge. Better information and targeted city marketing could help to remedy this.

The *third challenge* is to establish effective regional learning systems as a means to counter negative social effects from a divided labor market, favoring the opportunities for the higher educated but with bleak prospects for the lower end of the labor market. The HEIs are already taking steps to build more effective regional learning systems, but the coalition supporting such systems should be broadened and must for example include the business community, intermediary organizations in the labor market and social security organizations. As a side effect, this may help promote the cause of life-long learning which also benefits from more effective regional learning systems.

The *fourth challenge* is to adopt an integrated approach to the labor market. We have seen in chapter 4 that urban sprawl reduces the growth of labor supply and in its track that of employment opportunities. The difficult housing market in the city combined with the mounting problems of commuter traffic may deepen these effects of urban sprawl. This poses a serious threat to the competitive position of the economy in the whole metropolitan area in the mid and long term. It also undermines the contribution of the HEIs to regional development due to the risk of a human capital flight. Such risks require close monitoring. How do the demand and supply of higher education develop in the region? What is the labor market position of higher education graduates? These are developments which the HEIs should monitor more closely in order to safeguard their positions. The HEIs should be aware of the options open to them to improve their quality as national and international talent magnets. In addition, coalition formation is called for to effectively tackle the bottlenecks which hinder the development of the regional knowledge-based economy.

7.4 Conclusion: the road forward

7.4.1 The need for increased investment

The lessons of the self-evaluation report point to a common agenda with several options. The main task facing the stakeholders in the Amsterdam metropolitan area is to increase the level of investment in knowledge. This is the principal weak point which emerged in the SWOT-analyses made for this report. The Amsterdam region underperforms if we look to private investment in R&D. The level of public investment in R&D is on the average national level, which is understandable given the extent of the publicly financed higher education and scientific research sector in the region. The main bottleneck is that this output in research and skills does not attract more investment from the private sector. It will be the main task of the region in the coming years

to increase the interaction between public and private investment in R&D as a means to raise the general level of innovative output in the Amsterdam metropolitan area.

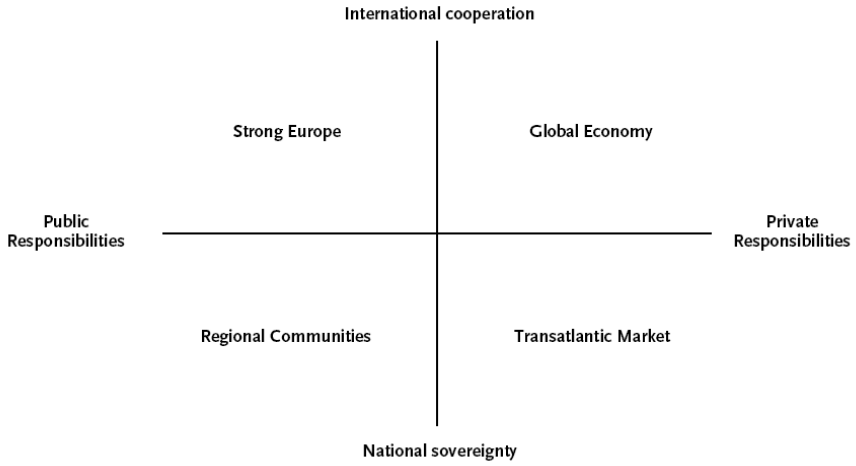
7.4.2 Two scenario's for future action

The question is how to reach this goal. This section develops different strategies for action. The strategies reflect that the future is not given. The challenges for the region depend on different contingencies which are best addressed in terms of scenario's. This study profits from the scenario's developed by the Netherlands Bureau for Economic Policy Analysis (CPB) which form a common standard of reference in Dutch policy analysis. The box below gives the key information on the CPB-scenario's for the period to 2040. We focus in this report on *global competition* and *regional communities* as the two base scenario's for our action plans, because they emphasize the distinction between public and private responsibilities. Global competition signifies an international playing field with intensive competition, placing emphasis on the need to make optimal use of market-driven incentives. In this environment private investment will be the leading actor, as the fruits of public investment are likely to be either misdirected or ineffective due to the fact that direct and indirect economic gains will leak away to other regions and possibly nations. In regional communities there is more scope for public driven action. Here market driven incentives are much weaker developed than in the global competition scenario. Market failures are likely to result in a suboptimal allocation of investment funds, calling for corrective actions by the government.

The scenario's therefore support different strategies. But there are a few common starting points for both options. These are *first* that investment is not a unidirectional goal as the capital stock to be invested in consists of different dimensions. The standard notion of investment in productive capital (labor and capital) supports a narrow interpretation of economic well-being, generally expressed in term of economic added value (GDP). The stakeholders in the Amsterdam region support a broader conception of economic well-being which extends our view of the capital stock to the areas of social, cultural and environmental development. *Secondly*, the focus of the stakeholders in the Amsterdam metropolitan area is never exclusively limited to the region. In contrast, even now the knowledge institutes as well as the business community in this area strongly focus on the opportunities arising in the national and international economy, even though they recognize the link between a strong and dynamic regional innovation system and success in the national and international arena.

Box 7-2: Four futures for Europe

De Mooij en Tang (2004) have developed four scenarios for the future development of the international economy. These scenario's provide a structure for discussing the way forward in the Amsterdam metropolitan area in a comprehensive framework. The key variables for the scenario's are shown in the figure below. Depending on the degree of cooperation in the international arena and the degree of competitiveness in the international economy, four quadrants can be isolated.



This report focuses on Global Economy and Regional Communities as the two scenario's which best represent two distinct futures: one in which public responsibilities are leading and one which strongly leans on private responsibilities.

Global Economy: Economic integration in this scenario is broad and global. As countries find it in their mutual interest, the new WTO round succeeds and economic integration in an enlarging European Union intensifies. The problem of climate change intensifies. National institutions become increasingly based on private initiatives and market-based solutions. European governments concentrate on their core tasks, such as the provision of pure public goods and the protection of property rights. They engage less in income redistribution (not only between rich and poor but also between young and old) and public insurance. Incomes become more unequal, but grow relatively fast on average. Besides, social-economic mobility is high.

Regional communities: In this scenario, the world is fragmented into a number of trade blocks, and multilateral cooperation is modest. European countries rely on collective arrangements to maintain an equitable distribution of welfare and to control local environmental problems. At the same time, governments in this scenario are unsuccessful in modernizing welfare-state arrangements. A strong lobby of vested interests blocks reforms in various areas. Together with an expanding public sector, this development puts a severe strain on European economies.

Source: De Mooij and Tang (2004)

7.4.3 The action plan linked to the regional communities scenario

The strategies to be based on the two scenarios are organized as follows. Regional communities focuses on public leadership as the main driver for action. It requires the stakeholders in the Amsterdam metropolitan area to cooperate much more closely than is currently the case. Public leadership is needed to achieve this. The increased cooperation will result in a joint innovation strategy for the whole metropolitan area. Also the governance system is 'rationalized' in order to increase the 'focus and mass' of innovation programs. This means that the region is making clear choices concerning the key economic clusters to be supported by the joint regional innovation program (backing or picking winners). The funds needed for the execution of this program are raised from both public and private sources. The extra public funds are needed to stimulate an increased effort from private investors. After all, the supposition of this scenario is that capital

mobility in the world is slackening due to trade blocks and an unfavorable international climate for unrestricted global capitalism. The clear focus of the joint regional innovation strategy helps the HEIs to meet the regional demand for their services.
For the labor market regional communities implies a moderated skill biased growth. This means that the risk of a divided labor market is lower. Social problems such as the high unemployment rate at the lower end of the labor market call for an activist approach by the regional authorities. This will probably mean increased public investment in active labor market policies. Extra investment in education and schooling is part of this approach. The HEIs will be asked to play their part in building a regional learning system allowing students and workers to better employ and develop their talents.

Regional communities also means strong public support for the cultural sector and sustainable development. The Amsterdam metropolitan area will invest in a dynamic cultural climate which enhances its attractiveness for foreign companies and workers. Sustainable development will be one of the key sectors in this scenario, receiving support from national regulation demanding higher energy efficiency and lower CO2 emissions. Also the regional authorities will act as launching customers, which may boost the sustainability cluster in the region. The HEIs probably continue to act as exemplary organizations, developing good practices for sustainable development and investing in new research and knowledge transfers.

Bottlenecks in the transport and road infrastructure are solved through extra public investment. The housing market will remain troublesome, given that the role for social housing associations is strengthened rather than reduced. The rental market is not liberalized.

The reverse side of the strategy outlined here is a high fiscal burden. This puts a strain on entrepreneurship which will in this scenario remain one of the weak points in the economic structure of the Amsterdam metropolitan area.

7.4.4 The action plan building on the global competition scenario

In the global competition scenario the main driver for action is private initiative. In this scenario the stakeholders in the Amsterdam metropolitan area are forced to work together in order to maintain the competitive position of the region. But in this case the incentives for increased cooperation are mainly market driven. This means that new joint initiatives are developed bottom-up, a bit in the manner it is currently done. The regional authorities are mainly acting as intermediary channels aiming to bridge the gap between the different stakeholders. In this situation it is unlikely that a joint regional innovation strategy will emerge. The focus on market driven project emerging bottom-up implies that the innovation system branches like a tree. The risks of trying to shape this tree in a particular direction are probably also greater. Picking or backing winners is risky due to the possibility of wrongly directed investments. In the world of global competition the market decides which innovations emerge as the winners. That is, they must develop bottom-up. The preferred approach to innovation stimulation is through general measures supporting favorable regional preconditions for innovation. City marketing will therefore become a more important instrument for the regional authorities, building on the world class reputation of the knowledge institutes in the region and the attractiveness of its living environment.

The intense competition in the world economy forms a pull factor for the development of a knowledge-based services economy in the Amsterdam metropolitan area. This will prove the competitive edge of the region as one of the major global business gateways of the world. This position greatly increases the pressure on the HEIs to meet the demand from the regional community for higher educated workers and innovative scientific knowledge. Increased demand driven research and education will therefore be of paramount importance to the success of the global business gateway. The HEIs in this scenario are regionally anchored and have important economic impact on the region. The global competition scenario also means that the working

field of the HEIs will be increasingly international rather than regional. This emerges due to increased student and worker mobility in the globally competitive world. A world class global business gateway requires world class higher education and research. The knowledge base for this type of institutions is worldwide and would be impossible to develop on the basis of scientific research from the region alone.

In global competition skill biased economic growth is likely to cause a dual labor market with difficult labor market prospects for the lower educated and relatively better income opportunities for the higher educated. The social problems emerging from this situation will require an adequate response from the regional community. The need for more effective regional learning systems is met by projects and initiatives emerging bottom-up. The HEIs must play a role in this approach together with schools at the secondary level. Regional public authorities will probably facilitate this process but lack the means to offer extensive financial stimulus. Most likely private partners step in recognizing the need to secure a dynamic labor market in the region with a sufficient supply of workers and graduates with higher education.

The cultural sector in the Amsterdam metropolitan area is likely to prosper in the global competition scenario. The economy draws highly educated workers to the region which form the audience for the growing number of seats in theatres and concert halls. This in turn draws private investors to the sector which helps maintain the infrastructure needed in this sector. As a spin-off the creative sector will develop into a cluster with large economic potential for the region.

Rapid growth in the world economy in this scenario intensifies the need for sustainable development. But the steps forward in this direction are frustrated by the lack of international cooperation and regulation. This undermines the economic prospects for a sustainability cluster in the Amsterdam region and means that the cooperation between the HEIs in this field needs to be strengthened bottom-up.

Table 7-1 below summarizes the two possible action plans for the Amsterdam metropolitan area.

7.4.5 Conclusion

Scenario's like the ones discussed in this closing chapter present policy makers with largely externally driven developments like the intensity of international competition. These are givens when it concerns the development of a regional plan of action for social and economic development. However, modern theory teaches us the importance of a proactive approach to the agenda for city and regional development. The reasons for doing so are the following.
First, many determining factors for economic growth are location-specific: This is the lesson from urban economics and geographical economics (Krugman, 1998; Brakman, Garretsen and van Marrewijk 2001). Cities emerge partially as a result of a clustering of economic activity. This clustering arises because firms and industries reap economic benefits from their mutual proximity. We call these benefits agglomeration effects which are made up of external economies of scale like the existence of a large local market for specialized inputs and labor market pooling. On the demand side the love-of-variety in a large local market plays a role.

Second, the literature of endogenous economic growth underlines the crucial role of increasing returns to scale in the process of economic growth (Romer, 1986). The importance of this finding is that it makes cities and regions at least partly the director of their own economic success. They create the conditions under which the externalities or spillovers of local economic activity can be internalized, that is, used to the benefit of a still faster process of economic growth. In a nutshell, the concentration of economic activities in urban centers creates local spillovers likes the ones mentioned above, which foster the accumulation of human capital and so aids economic growth. In turn economic growth affects the patterns of urbanization which makes the whole process a cycle of interrelated activities which we call endogenous economic growth. Black and Henderson (1999) stress that regional authorities may act as a catalyst in this endogenous process of growth,

because they are better informed about their own needs and changing industrial composition than for instance the national authorities.

Third, creativity is emerging as a separate driver of economic growth. Research points out that regions with a high share of higher educated workers generally have above average rates of economic growth. This underlines the need for regions to invest in human capital and higher education. Places with a greater number of talented people grow faster and are better able to attract more talent. The key question for regions is how to attract this talent in the first place and how to retain human capital when its leaves the school or university benches. Or as Florida (2003) puts it, “why do creative people cluster in certain places? In a world where people are highly mobile, why do they choose some cities over others and for what reason?” His answer is teleological: creative people live in a specific region because they want to live there. He stresses that creative people like scientists, engineers and other highly educated professionals are not moving to specific cities and regions for traditional (economic) reasons. What they look for in communities are high quality living, an openness to diversity of all kinds and above all the opportunity to validate their identities as creative people. This offers scope for a regional agenda focusing on creating the right conditions for turning Amsterdam into a global talent magnet.

Such lessons provide input for a regional action plan for the Amsterdam metropolitan area placing HEIs centre stage. This agenda should try to promote increasing returns of scale in the region, which can be achieved by establishing close ties between emerging technologies in promising economic sectors such as the life sciences and the ICT-sector. In addition the opportunities for non-technological innovation should be boosted which for Amsterdam are abundantly found in the cultural complex. Culture and education are two of the key factors for turning Amsterdam into a talent magnet of national and international importance. All stakeholders in the region should recognize the added value of the attraction of the region for knowledge intensive businesses, highly educated workers and talented scientists. The action plan for the region must include measures to maximize the attraction force of this magnet, perhaps in the form of a pact or convenant between all parties concerned. The HEIs in the Amsterdam area should take a lead in establishing those ties, but it also requires the cooperation of the business sector and stresses the importance of valorization and entrepreneurship. Concerning this latter aspect it is of the highest importance that Amsterdam not only becomes the city of teaching and learning, but also the city of entrepreneurship it once was.

Table 7-1: Scenario's and action plans for the Amsterdam metropolitan area

Scenario	Regional communities	Global competition
Opportunities	Increased room for cooperation. Active role for the government may aid developing clusters like culture and sustainable development. Ageing fosters life science as a growth sector.	Strong pull towards knowledge based services increases the demand for the financial services sector and other cluster in the region. The logistics cluster flourishes due to the growing world economy. Entrepreneurship blossoms and is supported by initiatives like CASE.
Threats	Decreased incentives for entrepreneurship. Slackening of capital mobility and inability to raise private r&d.	Focus on competition rather than cooperation. Skill biased growth raises the need to handle social problems. The problems in the region's infrastructure and housing market will mount and threaten economic growth.
Approach to innovation policy	Joint regional innovation agenda, backing winners. Focus on public leadership.	Incentive for increased private r&d investment must emerge bottom-up. Emphasis is placed on creating favorable regional conditions for innovation.
Labor market issues	Increased public investment in social cohesion. Increased investment in education and life-long learning as a form of 'second opportunity' education.	HEIs supply knowledge and skills to foster social cohesion. A more effective regional learning chain must develop bottom up and is supported by public-private investment.
Cultural development	Increased public investment. Creative sector develops into one of the main economic clusters of the region.	Cultural sector as one of the competitive advantages of the region. Focus on increased private investment
Sustainable development	Strong public leadership and regulation pushes sustainable development. There is must public and political pressure on the HEIs to join forces in supporting sustainability.	Activities of the HEIs will remain differentiated. Joint action must emerge bottom up.

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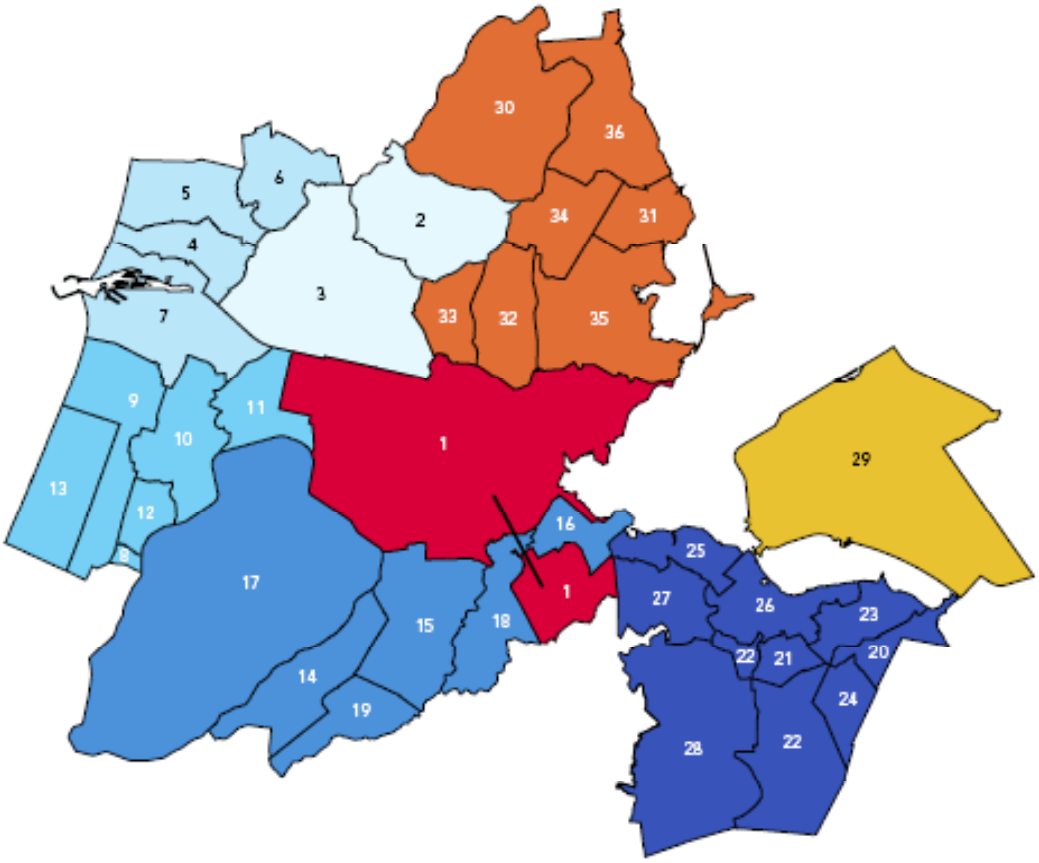
ANNEX A: MAP OF THE AMSTERDAM METROPOLITAN AREA

Figure A-1: The Amsterdam metropolitan area, divided by municipalities and COROP regions (1 January 2008)



1 Amsterdam
2 Wormerland
3 Zaanstad
4 Beverwijk
5 Heemskerk
6 Uitgeest
7 Velsen
8 Bennebroek
9 Bloemendaal
10 Haarlem
11 Haarlemmerliede en Spaarnwoude
12 Heemstede
13 Zandvoort
14 Aalsmeer
15 Amstelveen
16 Diemen
17 Haarlemmermeer
18 Ouder-Amstel
19 Uithoorn
20 Blaricum
21 Bussum
22 Hilversum
23 Huizen
24 Laren
25 Muiden
26 Naarden
27 Weesp
28 Wijdemeren
29 Almere
30 Beemster
31 Edam-Volendam
32 Landsmeer
33 Oostzaan
34 Purmerend
35 Waterland
36 Zeevang

* The numbers in the figure indicate municipalities, the colors refer to COROP regions
Source: O+S Amsterdam (2008a)

ANNEX B: HEIs IN THE AMSTERDAM METROPOLITAN AREA

Institution	City	Type of HEI	Number of staff (2007)	Number of students (2008)	% foreign Dutch national students (2008)	Institutional type
University of Amsterdam	Amsterdam	University	3,811 fte	28,331	28.6%	Multi-sector
VU University Amsterdam	Amsterdam	University	3,238 fte	20,984	30%	Multi-sector
Hogeschool van Amsterdam	Amsterdam, Almere and Heemskerk	UAS	1,966 fte	38,139	35.6%	Multi-sector
Hogeschool INHolland	Amstelveen, Amsterdam, Diemen, Haarlem and Velsen	UAS	1,039 fte	14,641	38%	Multi-sector
Gerrit Rietveld Academie	Amsterdam	UAS	88 fte	997	56.2%	Mono-sector (arts)
Amsterdamse Hogeschool voor de Kunsten	Amsterdam	UAS	426 fte	2,940	36.4%	Mono-sector (arts)
Hogeschool IPABO	Amsterdam and Almere	UAS	117 fte	1,451	13%	Multi-sector
Fontys Hogeschool	Amsterdam	UAS	3,033 fte	36,524		Multi-sector
St. Amsterdamse Balletacademie	Amsterdam	UAS	-	-		Mono-sector (arts)
Hogeschool Markus Verbeek	Alkmaar, Almere, Amsterdam, Haarlem and Zaanstad	UAS	-	-		Multi-sector
Hogeschool TIO	Amsterdam and Haarlem	UAS	-	-		Mono-sector (hospitality and tourism)
The New School	Amsterdam	UAS	-	-		Mono-sector (media)

for Information Services						
Hogeschool Dirksen B.V.	Amsterdam	UAS	-	-		Mono-sector (technology)
Hotelschool Den Haag	Amsterdam	UAS	-	-		Mono-sector (hospitality and tourism)
Hogeschool voor Economische Studies	Amsterdam	UAS	-	-		Mono-sector (economics)
Hogeschool Praehep	Amsterdam, Almere, Haarlem and Zaanstad	UAS	-	-		Mono-sector (economics)
B.V. Hogeschool Delta	Amsterdam	UAS	-	-		Mono-sector (economics)
Hogeschool Schoevers	Amsterdam	UAS	-	-		Multi-sector
Stichting Hoger Onderwijs NOVI	Amsterdam, Almere and Zaanstad	UAS	-	-		Multi-sector
Hogeschool DOC	Amsterdam	UAS	-	-		Multi-sector
Hogeschool NCOI	Amsterdam	UAS	-	-		Multi-sector
Stichting Hoger Onderwijs voor Bedrijfskundige Informatiekunde	Amsterdam	UAS	-	-		Multi-sector
ITV Hogeschool voor Tolken en Vertalen	Amsterdam	UAS	-	-		Mono-sector (language and culture)
KBK Hogeschool B.V.	Amsterdam	UAS	-	-		Multi-sector
Hogeschool Schumann Akademie B.V.	Amsterdam	UAS	-	-		Mono-sector (language and culture)
Hanzehogeschool	Amsterdam	UAS	-	-		Mono-sector (language and

Groningen						culture)
Hogeschool ISBW B.V.	Amsterdam	UAS	-	-		Multi-sector
Hogeschool Thorbecke	Amsterdam and Haarlem	UAS	-	-		Mono-sector (economics)
Hogeschool Utrecht	Amsterdam	UAS	-	-		Mono-sector (teacher education)
Azusa Theologische Hogeschool	Amsterdam	UAS	-	-		Mono-sector (teacher education)
Centrum voor Studie en Documentatie voor Latijns Amerika	Amsterdam	UAS	-	-		Mono-sector (language and culture)
Europort Business School	Amsterdam	UAS	-	-		Mono-sector (economics)
Pro Education B.V.	Amsterdam	UAS	-	-		Mono-sector (technology)
HES Consultancy B.V.	Amsterdam	UAS	-	-		Mono-sector (economics)
Nederlandse School voor Onderwijs-management	Amsterdam	UAS	-	-		Mono-sector (teacher education)
Amsterdam School of Real Estate	Amsterdam	UAS	-	-		Mono-sector (real estate)
Federatie Belasting Academie	Amsterdam	UAS	-	-		Mono-sector (law)
Instituut Brouwer	Almere	UAS	-	-		Mono-sector (economics)

Hogeschool NCOI	Almere	UAS	-	-		Multi-sector
Hogeschool Haarlem	Haarlem and Amsterdam	UAS	-	-		Multi-sector
HBO Nederland	Diemen	UAS	-	-		Multi-sector
Stichting Hogere Opleidingen 'Bandoera'	Haarlem	UAS	-	-		Multi-sector
Hogeschool Haarlem	Haarlem	UAS	-	-		Multi-sector
Nationale Luchtvaart School	Haarlemmer-meer	UAS	-	-		Mono-sector (aviation)
Hogeschool voor de Kunsten Utrecht	Hilversum	UAS	-	-		Mono-sector (arts)
Hogeschool Notenboom	Hilversum	UAS	-	-		Multi-sector
Stichting Hogeschool Rens & Rens	Hilversum	UAS	-	-		Mono-sector (technology)
Media Academie	Hilversum	UAS	-	-		Mono-sector (media)
Hogeschool Utrecht	Velsen	UAS	-	-		Mono-sector (technology)

Source: IB-Groep (2009), HBO-raad (2008), VSNU (2008), Individual HEIs

ANNEX C: KEY ECONOMIC INDICATORS

Table C.1: GDP per capita (euros)

	1996	2000	2004	2006
Groot-Amsterdam	30,353	39,263	47,800	50,896
Nederland	20,589	26,245	30,168	33,031

Source: Statistics Netherlands Statline (2006d)

Table C.2: GVA per capita (euros)

	1996	2000	2004	2006
Groot-Amsterdam	27,251	35,079	42,515	45,127
Nederland	18,485	23,448	26,832	29,287

Source: Statistics Netherlands Statline (2006d)

Table C.3: The Amsterdam metropolitan region in an international perspective

Population		Economic size	
Region	Population	Region	Gross regional product (billion EUR)
188. Kassel (Germany)	1,248,900	50. West Yorkshire (UK)	63.48
189. Střední Morava (Czech Republic)	1,229,500	51. Centre (France)	63.45
190. Midtjylland (Denmark)	1,223,600	52. Münster (Germany)	62.62
191. Groot-Amsterdam (CR)*	**1,222,305**	**53. Groot-Amsterdam (CR)***	**61.66**
192. Dorset and Somerset (UK)	1,221,200	54. Région de Bruxelles-Capitale/Brussels (Belgium)	60.90
193. Erzurum (Turkey)	1,217,100	55. Freiburg (Germany)	60.73
194. Friuli-Venezia Giulia (Italy)	1,210,400	56. Västsverige (Sweden)	60.72

* Due to the lack of data on the level of the Amsterdam metropolitan area, the gross regional product presented in the table is for the geographically smaller greater Amsterdam region (consisting of the COROP areas Amsterdam, Overige agglomeratie Amsterdam, Edam-Volendam e.o. and Haarlemmermeer e.o.)

Source: Eurostat (2006), O+S Amsterdam (2008)

ANNEX D: ORGANIZATIONAL STAKEHOLDERS IN THE HE-SYSTEM

Advisory bodies:

- AWT (Advisory Council for Science and Technology Policy);
- SER (Social and Economic Council of the Netherlands);
- WRR (Scientific Council for Government Policy);
- CPB (Netherlands Bureau for Economic Policy Analysis);
- SCP (Social and Cultural Planning Office);
- Rathenau Institute (Organization that studies the societal implications of science and technology);
- COS (the Consultative Committee of Sector Councils for Research and Development).

Funding bodies/agencies:

- Ministries/departments:
    - Ministry of Education, Culture and Science (OCW);
    - Ministry of Economic Affairs (EZ);
    - Ministry of Agriculture, Nature and Food Quality (LNV);
    - Ministry of Transport, Public Works and Water Management (VWS);
- Intermediary bodies:
    - NWO (Netherlands Organization for Scientific Research);
    - KNAW (Royal Netherlands Academy for Arts and Sciences);
    - STW (the Technology Foundation);
    - ZonMw (Netherlands Organisation for Health Research and Development);
    - SoFoKleS (Social Fund for the Knowledge Sector);
    - Zestor (Labor Market and Educational Fund for the HBO sector);
    - Innovation Platform;
    - SenterNovem (agency of the ministry of Economic Affairs that aims to promote sustainable development and innovation);
    - Syntens (innovation platform which aims to promote interaction between SMEs and HEIs).

Consultative bodies:

- HO Kamer (Higher Education Consultative Committee);
- HBO-raad (Netherlands Association of Universities of Applied Sciences);
- VSNU (Netherlands Association of Universities);
- Studentenkamer (the Student Chamber).

Interest groups:

- VNO-NCW (the Confederation of Netherlands Industry and Employers);
- MKB Nederland (Royal Association MKB Nederland, representing the SME sector);
- FNV (Federation of Dutch Labor Unions);
- CNV (National Federation of Christian Trade Unions);
- LTO-Nederland (Dutch Organization for Agriculture and Horticulture).

ANNEX E: REGIONAL PARTNERSHIPS OF AMSTERDAM HEIs

Name project/initiative	**Description**	**Regional partners**
Netherlands Institute for System Biology (est. 2007)	Institute that aims to coordinate and share research efforts, knowledge, and grant applications on behalf of its partners, and systems biology at large.	**University of Amsterdam, VU University Amsterdam**, FOM Institute for Atomic and Molecular Physics and National Research Institute for Mathematics and Computer Science
Urban Studies: Global Flows, Local Environment, Organized Diversity, and Governance	Research programme at UvA which focuses on cities and urban processes, in particular those associated with migration and social integration.	**University of Amsterdam**
Amsterdam Centre for Service Innovation (est. 2009)	Centre that provides education to executives and stimulates academic research into management of innovation processes in service-oriented companies	**University of Amsterdam, VU University Amsterdam**, municipality of Amsterdam, Telematica Instituut, Air France, KLM, IBM Benelux and Rabobank.
Amsterdam Living Lab (est. 2007)	Institute that generates and implements new design processes in ICT.	AIM, de Waag Society and Telematica Instituut
Life Science Centre Amsterdam (est. 2007)	Cooperative partnership of TTOs of research institutions in Amsterdam with the aim of promoting knowledge valorization	**University of Amsterdam/AMC, VU University Amsterdam/VUmc**, AIM, Amsterdam Topstad, Netherlands Cancer Institute (NKI) and Sanquin
REDICT (est. 2008)	Cooperative partnership between six European regions and clusters (18 partners), which share a strong R&D presence in the field of ICT and new media and the sense that this position has to be exploited for maximal economic and social benefit. They see that the factors that influence the transfer of knowledge to SMEs are complex and often badly understood and want to exchange experiences and best practices to better understand these factors and to make use of them to boost compositeness and economic performance.	**University of Amsterdam**, municipality of Amsterdam, and the municipalities of Berlin, Bucharest, Copenhagen, Dublin and Paris.
www.kennispoort amsterdam.nl	Website through which the four major HEIs in the Amsterdam metropolitan region make their knowledge available to SMEs. The	**University of Amsterdam, VU University Amsterdam, Hogeschool van Amsterdam, Hogeschool INHolland,** MKB

	website functions as a portal for research questions which can be filed by SMEs to one of the HEIs.	Netherlands, Kenniskring Amsterdam, VNO-NCW West and Syntens
CASE (est. 2006)	Initiative that aims to improve education in the field of entrepreneurship at UAS and research universities in Amsterdam	**University of Amsterdam, VU University Amsterdam, Hogeschool van Amsterdam, Hogeschool INHolland,** KVK Amsterdam, Amsterdram Topstad, Kenniskring Amsterdam, MKB Netherlands
Duisenberg School of Finance (est. 2008)	Institution set up by the Dutch financial sector together with several Dutch research universities, with the aim to establish a number of high profile programmes in finance at the MSc, MPhil, and PhD level.	**University of Amsterdam, VU University Amsterdam,** Tilburg University, Erasmus University Rotterdam, ING, Aegon, Fortis, APG, NYSE Euronext, SNS Reaal and the Dutch Central Bank.
Zuidas Law Academy	Educational programme within the VU Law Academy dealing with corporate law and financial law	**VU University Amsterdam** in cooperation with the banking industry and law firms located on the Zuidas business district in Amsterdam.
Sportas Amsterdam	Initiative of the municipality of Amsterdam to create an international top location for sport. The goal is to create sport scientific institute which can compete with other national and international sport institutions.	**VU University Amsterdam, VUmc,** municipality of Amsterdam, Centrum voor Topsport en Onderwijs.
VU Cancer Center Amsterdam	VU University Medical Center aims to revitalize others while continually revitalizing (reinvigorating) itself, and making its own contribution to future medical knowledge.	**VU University Amsterdam/VU medical center**
Center for Advanced Media Research Amsterdam (CAMeRA)	The CAMeRA center wants to study the impact (particularly new) media and technology have on individuals' life, their learning and entertainment, and on their health.	**VU University Amsterdam,** game developers in Amsterdam and IT-companies.
Academic Center for Dental Care		**University of Amsterdam/AMC** and **VU University Amsterdam/VUmc**
BSIK projects	Virtual Lab for e-Science, Gigaport, Neuro-BSIK and *Vernieuwend Ruimtegebrek*	**University of Amsterdam, VU University Amsterdam**
TI Pharma	TI Pharma is a collaborative structure consisting of industrial and academic research teams. TI Pharma conducts groundbreaking, cross-disciplinary research and trains their personnel in improving the	**University of Amsterdam, VU University Amsterdam,** other Dutch research universities and research institutions, and the pharmaceutical industry.

	efficiency of the entire drug discovery and development process.	
Amsterdam University College	The Amsterdam University College is an initiative of the UvA and VU. It is a small-scale college top quality, which provides an English-taught Bachelor programme that crosses the boundaries of languages, cultures and academic disciplines.	**University of Amsterdam** and **VU University Amsterdam**
Other research schools	Experimenteel Psychologische Onderzoekschool (EPOS), Holland Research School of Molecular Chemistry (HRSMC), Huizinga Instituut, Interuniversitair Centrum voor Geo-oecologisch Onderzoek (ICG), Onderzoekschool Kurt Lewin Instituut (KLI), Onderzoekschool Ethiek, Onderzoekschool Neurowetenschappen Amsterdam, Onderzoekschool voor Informatie- en Kennissystemen (SIKS), Onderzoekschool Milieuwetenschappen (SENSE).	**University of Amsterdam** and **VU University Amsterdam**
De Gezonde Wijk	Research programme focusing on the relation between physical characteristics of the urban environment and health of the Amsterdam inhabitants	**VU University Amsterdam,** municipality of Amsterdam
Internships at the Directorate of Justice of the municipality of Amsterdam		**Hogeschool van Amsterdam**, municipality of Amsterdam
City Academy	Initiative of HEIs and housing corporations in Amsterdam to improve the interaction between students which participate in projects, professionals working in the boroughs of Amsterdam and active inhabitants of Amsterdam. The goals of the City Academy are: to perform research, support existing projects and initiate and develop new projects.	**University of Amsterdam, VU University Amsterdam, Hogeschool van Amsterdam, Hogeschool INHolland,** Eigen Haard, deKey, Rochdale, Stadgenoot, Ymere, Diversion and Kennedy van der Laan.
Mantelzorgers in Amsterdam	Research programme focusing on voluntary care.	**University Amsterdam** and **Hogeschool van Amsterdam**
De Karthuizer	Practical and research center which aims to provide occupational training for HvA students within educational programmes related to social sciences and law. HvA students	**Hogeschool van Amsterdam,** municipality of Amsterdam, other regional partners.

	work together with Amsterdam residents and professionals to solve concrete social questions which arise in the urban environment.	
Research programmes funded by RAAK-subsidies	Human Resource Management at the municipality of Amsterdam	**Hogeschool van Amsterdam,** municipality of Amsterdam
Krachtwijken	Project which uses educational programmes and internships to improve the living quality in the disadvantaged Amsterdam boroughs. The project *Krachtwijken* was established as part of a central government's effort to improve disadvantaged boroughs nationwide.	**University Amsterdam** and **Hogeschool van Amsterdam**
Research programmes funded by RAAK-subsidies	Learning-working-companies in the creative industry.	**INHolland,** Syntens, iMMovator Cross Media Network and others
Netwerk023	A network for companies in the media, advertising and internet sector that aims to support cooperative ventures between companies and students in the creative industry.	**INHolland,** Urbanology, Wazooky, Blutarsky and others.
Networking sessions	INHolland holds networking sessions with TNO to set up innovative projects together.	**INHolland** and TNO

ANNEX F: BUSINESSES REPRESENTED IN THE ADVISORY BOARD OF IAMSTARTER

- ABN AMRO Bank N.V.
- ASP NV
- BioGeneration Ventures
- Clinquest Europe
- CWI-Incubator BV
- Ernst & Young
- Forbion Capital Partners
- Genzyme Netherlands
- Gilde Investments Management
- Hezelburcht BioTop
- ING Bank District Amsterdam
- Innovation Factory
- KPMG
- Life Science Partners
- Mediagilde
- MedSciences Capital Management
- Microvision
- Middenduin Life Sciences B.V.
- New Energy Docks
- NextStage
- PriceWaterhouseCoopers
- Rabobank Amsterdam en Omstreken
- Sanquin Blood Foundation
- VenGen
- Yellow Research

ANNEX G: CAREER DEVELOPMENT INITIATIVES

University of Amsterdam/AMC

Employability fund: fund for educating and coaching VU employees.
Career orientation for PhDs.
Courses on knowledge transfer: provide insight in procedures regarding patent requests, protection of intellectual property and subsidies.

Programme introduction professors: supporting programme for professors.
Professionalization programme for lecturers
Sabbatical leave: offers the possibility to scientific personnel to fully devote one half year to research.

Management development programme.

VU University Amsterdam/VUmc

The VU Centre for Career and Development offers the following services:

- In company training;
- Career development for PhDs and researchers;
- Educational advice;
- Individual career orientation and coaching.

Management development. The VU has a manager leadership development since 2007. The following activities are organized:

- Course for tactical leadership;
- Annual conversations with management board, directors and deans;
- Successor planning.

Educational center.

Hogeschool van Amsterdam

Mobility center.

Casa d'Oro: provides courses and workshops to employees.

Educational fund: provides funds for further development of lecturers such as schooling and PhD tenures.

Hogeschool INHolland

INHolland Academy: provides post-initial education in the form of courses, training and educational programmes and coaching.
Show & Share: an annual event on a wide variety of career development topics and best practices.

GLOSSARY

Bologna Declaration	The Bologna declaration is the main guiding document of the Bologna process. It was adopted by ministers of education of 29 European countries at their meeting in Bologna in 1999.
Foreign Dutch national	A person living in the Netherlands who is born in a foreign country or whose father and/or mother is/are born in a foreign country.
HAVO	The HAVO (*Hoger Algemeen Voortgezet Onderwijs*, literally, "higher general continuing education") has five grades and is attended from age twelve to seventeen. A HAVO diploma provides access to the HBO level of tertiary education.
HBO	*Hoger Beroeps Onderwijs*, a higher professional education
Het Hoogste Goed	Strategic agenda for the Netherlands higher education, research and science policy published in 2007 by the Ministry of Education, Culture and Science.
Innovatiebrief	Strategic innovation agenda published in 2003 by the Ministry of Economic Affairs.
Innovation Vouchers	Virtual coupons which can be traded by entrepreneurs for knowledge available at universities and research institutions.
Lectoraat	A ‘chair’ in HBO institutions, consisting of a lector and a surrounding knowledge circle of lecturers.
MBO	MBO (*Middelbaar Beroepsonderwijs*, literally, "middle-level vocational education") is oriented towards vocational training. Many pupils with a VMBO-diploma attend MBO. MBO lasts three to four years. After MBO, pupils can enroll in HBO or enter the job market.
Pieken in de Delta	White paper on regional economic policy published in 2004 by the Ministry of Economic Affairs.
Randstad	Conurbation in West Netherlands, consisting of the four largest cities (Amsterdam, Rotterdam, The Hague and Utrecht).
Technology Transfer Office (TTO)	Office within e.g. universities dedicated to identifying research which has potential commercial interest and strategies for how to exploit it.
Urban sprawl	Spreading of a city and its suburbs over rural land at the fringe of an urban area.

VMBO	The VMBO (*Voorbereidend Middelbaar Beroepsonderwijs*, literally, "preparatory middle-level vocational education") education lasts four years, typically from age twelve to sixteen. It combines vocational training with theoretical education in languages, mathematics, history, arts, and sciences. Sixty percent of students nationally are enrolled in VMBO. VMBO itself has four different levels, in each a different mix of practical vocational training and theoretical education is combined.
VWO	VWO (*Voorbereidend Wetenschappelijk Onderwijs*, literally, “preparatory scientific education”). A six year course of theoretical/academic education, typically from age 12 to 18. A VWO diploma provides access to WO training, although certain profiles (combinations of subjects) are required for admittance to study certain subjects.
WO	*Wetenschappelijk Onderwijs*, (literally “scientific education”) theoretical/academic education provided at a research university