

Knowledge and creativity at work in the Munich region

Pathways to creative and knowledge-based cities

ISBN 978-90-78862-01-7

Printed in the Netherlands by Xerox Service Center, Amsterdam

Edition: 2007

Cartography lay-out and cover: Puikang Chan, AMIDSt, University of Amsterdam

All publications in this series are published on the ACRE-website

<http://www2.fmg.uva.nl/acre>

and most are available on paper at:

Dr. Olga Gritsai, ACRE project manager

University of Amsterdam

Amsterdam institute for Metropolitan and International Development Studies (AMIDSt)

Department of Geography, Planning and International Development Studies

Nieuwe Prinsengracht 130

NL-1018 VZ Amsterdam

The Netherlands

Tel. +31 20 525 4044

+31 23 528 2955

Fax +31 20 525 4051

E-mail: O.Gritsai@uva.nl

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Knowledge and creativity at work in the Munich region

Pathways to creative and knowledge-based cities

ACRE report [No.]

Sabine Hafner

Manfred Miosga

Kristina Sickermann

Anne von Streit



Accommodating Creative Knowledge – Competitiveness of European Metropolitan
Regions within the Enlarged Union

Amsterdam 2007

AMIDSt, University of Amsterdam

ACRE

ACRE is the acronym for the international research project Accommodating Creative Knowledge – Competitiveness of European Metropolitan Regions within the enlarged Union.

The project is funded under the priority 7 'Citizens and Governance in a knowledge-based society within the Sixth Framework Programme of the EU (contract no. 028270).

Coordination:

Prof. Sako Musterd

University of Amsterdam

Amsterdam institute for Metropolitan and International Development Studies (AMIDSt)

Department of Geography, Planning and International Development Studies

Nieuwe Prinsengracht 130

NL-1018 VZ Amsterdam

The Netherlands

Participants:

- **Amsterdam** (Amsterdam institute for Metropolitan and International Development Studies, University of Amsterdam, the Netherlands)
Marco Bontje ~ Olga Gritsai ~ Heike Pethe ~ Bart Sleutjes ~ Wim Ostendorf ~ Puikang Chan
- **Barcelona** (Centre de Recerca en Economia del Benestar – Centre for Research in Welfare Economics, University of Barcelona, Spain)
Montserrat Pareja Eastaway ~ Joaquin Turmo Garuz ~ Montserrat Simó Solsona ~ Lidia Garcia Ferrando ~ Marc Pradel i Miquel
- **Birmingham** (Centre for Urban and Regional Studies, University of Birmingham, UK)
Alan Murie ~ Caroline Chapain ~ John Gibney ~ Austin Barber ~ Jane Lutz ~ Julie Brown
- **Budapest** (Institute of Geography, Hungarian Academy of Sciences, Hungary)
Zoltán Kovács ~ Zoltán Dövényi ~ Tamas Egedy ~ Attila Csaba Kondor ~ Balázs Szabó
- **Helsinki** (Department of Geography, University of Helsinki, Finland)
Mari Vaattovaara ~ Tommi Inkinen ~ Kaisa Kepsu
- **Leipzig** (Leibniz Institute of Regional Geography, Germany)
Joachim Burdack ~ Günter Herfert ~ Bastian Lange
- **Munich** (Department of Geography, Ludwig-Maximilian University, Germany)
Günter Heinritz ~ Sabine Hafner ~ Manfred Miosga ~ Anne von Streit
- **Poznan** (Institute of Socio-Economic Geography and Spatial Management, Adam Mickiewicz University, Poland)
Tadeusz Stryjakiewicz ~ Jerzy J. Parysek ~ Tomasz Kaczmarek ~ Michal Meczynski
- **Riga** (Stockholm School of Economics in Riga, Latvia)
Anders Paalzow ~ Diana Pauna ~ Vjacheslav Dombrovsky ~ Roberts Kilis ~ Arnis Sauka

- **Sofia** (Centre for Social Practices, New Bulgarian University, Bulgaria)
Evgenii Dainov ~ Vassil Garnizov ~ Maria Pancheva ~ Ivan Nachev ~ Lilia Kolova
- **Toulouse** (Interdisciplinary Centre for Urban and Sociological Studies, University of Toulouse-II Le Mirail, Toulouse, France)
Denis Eckert ~ Christiane Thouzellier ~ Elisabeth Peyroux ~ Michel Grossetti ~ Mariette Sibertin-Blanc ~ Frédéric Leriche ~ Florence Laumière ~ Jean-Marc Zuliani ~ Corinne Siino ~ Martine Azam
- **Milan** (Department of Sociology and Social research, University degli Studi di Milan Bicocca, Italy)
Enzo Mingione ~ Francesca Zajczyk ~ Elena dell’Agnese ~ Silvia Mugnano
- **Dublin** (School of Geography, Planning and Environmental Policy, University College Dublin, Ireland)
Declan Redmond ~ Brendan Williams ~ Niamh Moore ~ Veronica Crossa ~ Martin Sokol

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0 EXECUTIVE SUMMARY

The overall aim of this report is to trace the development path of the region of Munich in order to detect different conditions that impacted upon the development of Munich into a ‘creative knowledge region’.

Current socio-economic situation of Munich

Situating Munich in the national context (see chapter 1) it becomes apparent that Munich is one of the most important centres of research and development, of the high-tech industry as well as the media in Germany. With a current population of approximately 2,5 million inhabitants, the Munich region has developed into one of the most dynamic and economically prosperous urban agglomerations in Europe. The city is the solitary centre of the administrative district of Upper Bavaria (Nuts-2 region) which also belongs to one of the most dynamic regions of Europe in economic terms (see chapter 2).

The current positive economic situation of Munich (chapter 4) is reflected in the dynamic labour market, the low unemployment rate, the dynamic service sector, the high purchasing power as well as the positive demographic development. One part of Munich’s strength as a business location is based on the diversity of its economic structure and the mixture of global players and SMEs. This modern and balanced economic structure is often referred to as the ‘Munich Mix’ (Münchner Mischung). This term not only refers to the mixture of big and small enterprises, it also refers to the sectional structure of the economy. Another part of Munich’s economic success can be attributed to the existence of numerous clusters like biotechnology and pharmaceutical industry, medical technology, environmental technology, ICT, aerospace, the media and finances. They form the innovative growth poles of the city region. The clusters are not only made up by links among enterprises of the respective branches but also by links to the numerous research institutions in the Munich area, by the networks of SMEs and large enterprises as well as links to commercialisation protagonists.

As a prospering economic location, the Munich region records a positive population development: the population has grown continually since 1999. The proportion of foreigners (people with non-German passports) fluctuates around 17.4 percent, in the city of Munich it is around 24 percent (see chapter 3). However, the current economic success of Munich is accompanied by ‘poverty in the midst of prosperity’ – especially families with children, unemployed persons as well as foreigners are particularly affected by poverty.

Munich’s economic success has also led to booming land and housing prices and rents which pose severe problems especially for families with only one income as well as other less affluent households. This is one reason why Munich still has negative balances of migration with its region. Another problem is the cutback of state-subsidised housing which leads to

extremely restrictive access conditions and consequently to a concentration of disadvantaged groups in certain areas of the city.

Concerning the intraregional differentiation it is important to note that the suburbanisation of the population is still an issue: an over-proportionate growth of the population takes place in the surrounding areas with growth rates over 10 percent in contrast to a growth of less than 0.5 percent in the city. Marking a more recent trend, also knowledge-intensive enterprises as well as headquarters locate in suburbia – especially in the north-eastern part of the Munich region, on the so called airport axis.

Development Path of Munich

In chapter 3 several factors are identified which have contributed to the present economic and social profile of Munich: First of all, Munich is the capital and the administrative centre of Bavaria since the 15th century. Being also the residence of the Bavarian king and the royal family, Munich profited heavily from the high investment in the arts, architecture and the sciences. Especially the royal patronage of the sciences in the 19th century was of great importance for the development of quality industries which capitalised on new technologies and inventions (e.g. the media, technical instrumentation). Furthermore, instead of becoming a heavily industrialised town, Munich developed into a trading centre and city of commerce – which later on spared the city the difficult task of dealing with structural economic change.

The vote of the city council in favour of a tradition-oriented reconstruction after the massive destruction during World War II preserved the historical cityscape and now contributes to its attractiveness for tourists. Another decisive event was the move of Siemens from Berlin to Munich as it created the nucleus for the allocation of other German and international companies. The reconstruction years marked also the beginning of the Bavarian technology policy especially through investment in R&D as well as in the arm industry.

After the Oil crisis marked a temporary stop of the economic upturn, the Munich region developed into the leading German High tech region during the 1980s and 1990s. The economic development was supported by infrastructure policies of the Freestate of Bavaria as well as the city of Munich: crucial measures were the relocation of the airport and the trade fair in the 1990s as this gave the city the opportunity to develop new neighbourhoods and industrial estates.

The creative and knowledge-intensive industries in the city region of Munich

The Munich region can be considered to be one of the German leading locations for the creative and knowledge-intensive industries (see chapter 5). One third of all employees subject to social insurance contributions in the Munich region work in the creative knowledge sector, in the city of Munich even 37 percent of all employees. Almost 13 percent of the workforce is employed in the creative and knowledge intensive industries, 7 percent in finances, the second biggest sub-sector of the creative industries in Munich. Whereas the creative industries are characterised by small and medium firms, finances is mostly made up by big firms. Regarding the development of the creative knowledge economy over the years 1996 to 2004 the turnover as well as the number of firms has developed positively despite the crises of 2001.

Regarding the sub-sectors of the creative knowledge sector, several sub-sectors show strong cluster tendencies like the media as well as ICT and finances. Due to the increasing merging of the ICT industries and the media, both clusters complement another very successfully in the Munich region.

The high education level of the population, excellent transport infrastructure and a good accessibility as well as the high number of public and semi-public research establishments contribute to the attractiveness of the Munich region for the creative knowledge industries.

Concerning soft location factors Munich offers excellent cultural and leisure facilities. To conclude, it is not so much openness and tolerance but amenities such as environmental beauty, the presence of cultural activities, and the attractiveness of the built environment that draw highly skilled people to Munich.

Policies supporting the creative knowledge sector

Munich has strongly benefited from the technology and innovation policies of the state of Bavaria since the 1950s (Chapter 6). Concerning the financial scope, the possibilities of the state of Bavaria are much bigger than that of the city of Munich to finance programmes that are directed at improving entrepreneurship, commercialising knowledge and creating networks of innovation. In the 1950s and 1960s the Munich region strongly profited from the promotion of the armaments industry through the award of public sector contracts. From the 1980s up to the present, the conservative government of Bavaria (CSU) has set up several programmes for targeted support of innovation and technology: the money is spent on R&D, training, infrastructure, support for start-ups and technology transfer to make Bavaria an attractive location for the high tech industry. In 2006 the cluster campaign has been implemented to support state-wide networks interlinking business and scientific potential in 19 defined clusters. Compared to former programmes the funds of the cluster campaign are much smaller because the funds obtained from privatisation revenues have been used up.

Threats and Challenges

Although Munich's starting position for becoming a creative knowledge region seems to be excellent, several threats can be detected (see chapter 6): first of all there are the overall high costs of living in the region. Then, concerning the cultural knowledge industries a lack of governance and co-operation between the state actors and the city of Munich must be stated as there exists virtually no co-operation between the two actors and no strategic vision as to what direction the local economic development in the Munich region as a whole should take.

In chapter 7 the preliminary results of the Munich research are presented with special reference to the concept of path dependency and the cluster concept.

1 NATIONAL BACKGROUND

1.1 Introduction

The geographical location of Germany is in the centre of Western Europe. Numbering over 82 million inhabitants, Germany is the most populated European country: it also has one of the highest population densities in Europe. The distribution, however, is very uneven. Significant differences exist between the western and eastern states, the so-called '*Länder*', between the north and the south, as well as between urbanized and rural areas. Some 68 million people live in the eleven West German *Länder* and only 14.1 million in the five new *Länder*. Consequently, density in the East is only 145 people per square kilometre, while in the West (former FRG) it is only 261. Nearly one third of the overall population live in the 84 largest cities, all of which have populations of more than 100,000 people. Only 7.3 million live in communities with a population of less than 2,000. Population density also varies between the *Länder*: from 80 inhabitants per square kilometre in Mecklenburg-Western Pomerania to 521 in North Rhine-Westphalia. By far the most densely populated area of Germany is the Rhine-Ruhr region within North Rhine-Westphalia (some 11 million people within one agglomeration), followed in size by the rapidly growing greater Berlin region, which presently has 4.5 million. (Gans, 2001; Laux, 2001a, Laux, 2001b).

1.2 The German political and administrative system

The Federal State (*Bund*), the *Länder* and the local government districts represent the different levels of Germany's three-tiered administrative structure. These three levels have different responsibilities and tasks.

The Federal Republic of Germany consists of 16 federal states (see figure 1.1). The powers of the state are divided between government as a whole, the Federal Government and the federal states. The federal states have their own constitutions; own administrations and parliaments as well as their own responsibilities. The Federal Government has the legislative competence for areas such as immigration, foreign policy, defence, criminal law and telecommunications. The *Länder* are responsible for areas such as municipal law, culture, education and the media. There are three pan-state functions that the individual federal states exercise on their own: schooling (including to a large extent tertiary education), internal security (including policing) as well as the organization of local self-government (Laufer & Münch, 1997). Development planning in Germany is also organized in accordance with a system of graded responsibilities. The *Länder* and the local government districts have legal competence for spatial planning; the Federal Government only provides the framework. This demands cooperation between the different levels of planning. There is no fixed and determined development plan for the whole of Germany, only models and guidelines which

are developed by the Federal Government and the Länder. The Länder ratify these models and concepts in concrete directives and the local government districts ultimately implement them in legal plans (BBR, 2001). This process very clearly illustrates the core concept of the federal structure: subsidiarity. According to this concept, the smallest unit in the social community is capable of handling problems, bearing responsibility and making decisions on a whole range of issues, starting with the individual and working its way upwards via the family, associations and local authorities to the states and the nation as a whole.

Figure 1.1: The 16 states of the Federal Republic of Germany



Source: Federal Office of Administration, 2007

After the Federal State (Bund) and the Länder, the local government districts in Germany represent the lowest level in the three-tiered administrative structure. They also practice self-administration within the boundaries of their territory. Self-administration means that the local government district is responsible for all tasks relating to the local community. Local government districts' own activities represent the core activities undertaken by each local government district and may be voluntary (e.g. theatre, museums, buses, swimming pools etc.) or they may be prescribed by the State as obligatory (e.g. waste disposal, energy

supply, construction of schools and nurseries). The local government district is free to handle activities in these fields on its own or outsource them to private businesses (BVA, 2005).

Nevertheless, self-administration by the local government districts has its limits. In a growing number of areas within local government policies, the state government is becoming involved in municipal affairs on the basis of legal provisions, standards and financial subsidies. In reality, the relationship between the State and the local government districts relies on a complex, intertwined system of responsibilities, controlling authorities and financing systems. Through this system, the ability of the local government districts in terms of self administration is therefore restricted (Hafner & Miosga, 2001).

1.3 The German urban system

In contrast to many European countries which are characterized by the concentration of important international functions in one or two metropolises, the Federal Republic of Germany has a decentralized settlement structure. The decentralized pattern of the urban system, was and is further intensified by the federal structure. Each state has its own capital with administrative and governmental functions, like for example the city of Munich for Bavaria.

Agglomerations with a concentration of metropolitan functions like international trade fairs and exhibitions, company headquarters, high-ranking cultural and educational facilities and production facilities in the press, film and television sectors are the Rhine-Ruhr and the Rhine-Main areas, Cologne-Düsseldorf, Munich, Stuttgart, Hamburg and Berlin (BBR, 2005). Furthermore, these city regions have specialized in certain metropolitan functions which are complemented by manufacturing industries and service sector companies. Hamburg, for example, has become a centre for the media and the shipping industry, while Munich is focused on research, high tech industry and the media. Banks, financial services and the chemical industries are primarily concentrated in the Rhine-Main area. Furthermore, Munich, Hamburg, Stuttgart, Frankfurt, Cologne and Berlin are considered to be growth areas, whereas agglomerations which have a large share of old industries like mining, iron, leather and textiles are still facing severe development problems. Examples in this respect include the Saarland and the Ruhr area. Their economic structures are characterized by old industries, a disadvantaged job market and limited knowledge skills. Although the economic restructuring process has been ongoing for years, these regions continue to have a strong need for modernization. The same applies to the agglomeration areas in the New Länder (BBR, 2001).

1.4 Economic development in east and west Germany until 1990

Due to the division of Germany after the Second World War, economic development in the two German states was very different.

West Germany, established as a liberal parliamentary republic with a 'social market economy', experienced almost continuous economic expansion from the 1948 currency reform until the early 1970s. The recovery was accompanied by continuous growth in income and employment. High-volume production of consumer goods was prevalent. At the beginning of the 1970s, the first signs of stagnation became visible. When the oil crises of 1973 hit, economic problems in many sectors became apparent. Real gross domestic product

(GDP) growth slowed down and even declined; this remained true from the mid-1970s through the recession of the early 1980s. Unemployment has continued to increase since 1981 and remained at approximately nine percent until the end of the 1980s (Bührer, 2004). Economic development during the 1980s depended mainly on the growth of the service sectors and high-tech production (see table 1.1). This structural change has led to unbalanced economic development in terms of territory and sector (Gaebe, 2002).

Table 1.1: Employment by Sector 1960, 1970, 1980, 1990 (in millions)

Year	Primary sector	Secondary sector	Tertiary sector	Employees (totaling)
1960	3,5	12,5	10,2	26,2
1970	2,3	13,0	11,4	26,7
1980	1,4	11,6	14,1	27,1
1990	0,9	11,1	16,4	28,4
1994	0,8	10,0	17,5	28,3

Source: Gaebe 1998.

In general, the period spanning the 1960s and 1970s resulted in strong changes in West German regional structure. On the one hand, the southern regions with minor environmental problems, but a strong innovative potential, rose in prominence, whereas the old industrialized regions and the peripheral (rural) areas became depopulated and lost economic power. These developments resulted in a north-south disparity. Since the 1980s, the southern part has been the strongest with lower unemployment rates, higher income as well as more work and investment in R&D (Schätzl, 2002).

Development in the eastern part of the country, the German Democratic Republic (GDR) was different. Introduction of the state-controlled economy completely eliminated existing structures. The economic system, with its centralized planning, proved to be highly inefficient and the economy deteriorated. At the end of the 1980s, the economy in Eastern Germany was internationally uncompetitive. The capital stock was outdated and the production processes inefficient (Schätzl, 2002). As a consequence of reunification, most of the former GDR has been de-industrialised, causing increasingly high unemployment; thousands of former East Germans continue to migrate to western Germany to find jobs. This results in the loss of significant sections of the eastern work force, especially highly skilled workers and women who have shown themselves to be significantly more willing to move and who are more requested because they mostly work in service occupation

1.5 Economic and demographic development after 1990 – growing disparities

A major shock to Germany's overall economic situation occurred after German unification in 1990. The merging of the two systems has resulted in social and economic problems. Overall, since the early 1990s, the unified German economy has been performing weakly. This has been accompanied by a lack of domestic demand, harder competition and changing market structures and stagnation in investment.

Furthermore, since unification the economic, social and ecological differences between the regions have been overlapped by disparities between the old and the new Länder. So far the adjustment of living standards has not progressed as many had expected and

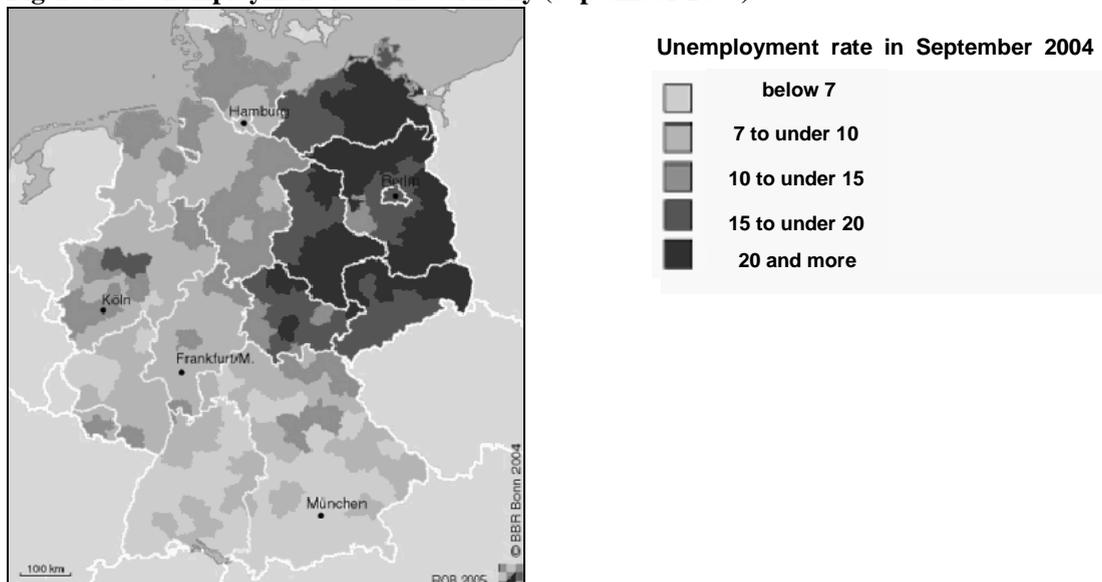
regional disparities have been increasing (Schätzl, 1998). In the following section the variable regional economic and demographic structure of Germany will be illustrated by several indicators:

1.5.1 Development of employment in Germany

The evolution and the performance of an economy depend first of all on the number of employees and on progress in sector-related changes from manufacturing to the service industry. Large numbers of highly qualified employees can then be seen as an indicator of regional competitiveness, while large numbers and a positive development of low-skilled employees are an indicator of low regional income and therefore deprived regional opportunities.

Broadly speaking, between 1997 and 2003, the job market development has been negative in east Germany, where some regions lost more than 15 percent (or even more) of their workforce (BBR, 2005). In West Germany, only a few peripheral regions experienced negative development rates, and these are mainly former heavily industrialized regions such as the Ruhr area and some mono-specialized regions (e.g. Pirmasens with shoe production in the state of Saarland). On closer observation, it becomes obvious that most of the German metropolitan regions have gained substantial numbers of new employees over the last six to eight years. The regions of Munich and Hamburg especially demonstrate growing rates of employment in general, while metropolitan regions such as Berlin-Brandenburg and the Saxon Triangle (Leipzig, Dresden and Zwickau-Chemnitz) in East Germany show rather declining rates of evolution in the workforce (BBR, 2005). This demonstrates a rather paradoxical situation: demographic stability and even growth goes along with declining job opportunities in these regions (see figure 1.2).

Figure 1.2: Unemployment rates in Germany (September 2004)



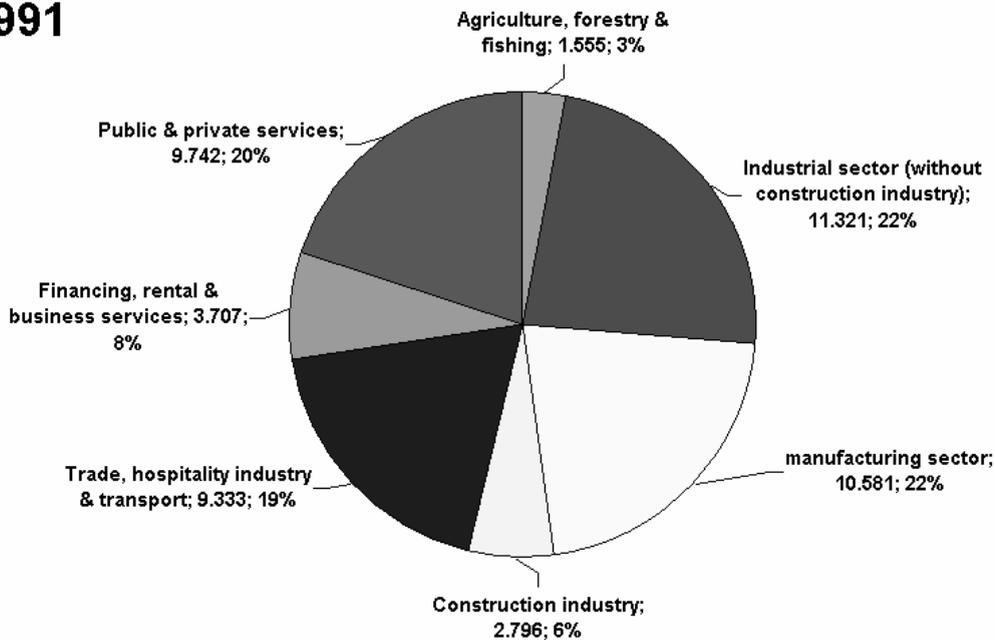
Source: BBR, 2005, adapted

In general, positive rates of development in metropolitan regions mark a significant trend for peripheral regions, which performed positively only before and up until 1990. From the 1990s onward, and therefore over the last 10-15 years, central areas (metropolitan regions with the areas between them ['Zwischenräume']) have caught up with regard to total employment numbers (BBR, 2005). On a county level, the decline and increase in the workforce may run in parallel, as might also be the case with regard to demographic changes and their specific evolution. Spatial distribution in workforce development indicates that core cities must be seen in the context of their hinterland, and therefore form a spatial unit. These spatial observations have led to some instances of planning and institutional focus on the role of metropolitan regions at a national executive level. Nevertheless, the heterogeneity within larger spatial units such as regions shows that negative and positive developments might occur in neighbouring counties. This highlights the importance of networks of local agents, who must interact in terms of solving inner-regional disparities using the relevant local endogenous means.

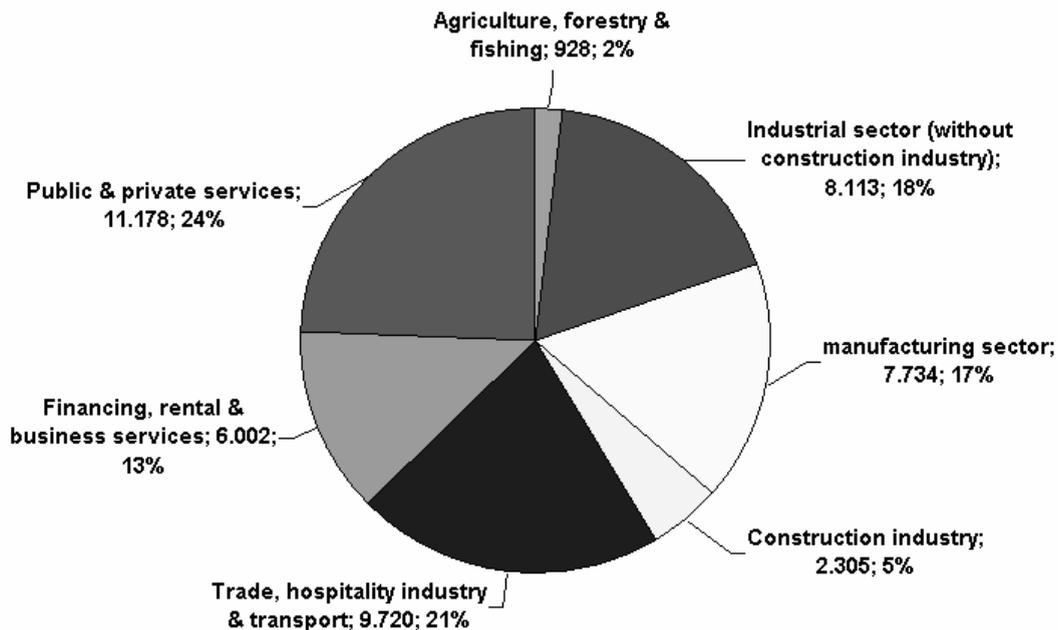
On a national scale, the spatial distribution of the workforce in the manufacturing industries (secondary sector) once more underpins an east-west disparity. It is significant that East Germany registers a rate of less than 50 employees in manufacturing per 1,000 inhabitants, while the southern part of Germany in particular registers rates of 75-125 (and more) per 1,000 inhabitants (see figure 1.3) (BBR, 2005).

Figure 1.3: Economic sectors in Germany 1991 and 2003 (absolute numbers in thousands and in percent)

1991



2003



Source: BAW/Statistisches Landesamt Bremen, 2004

When looking at the number of employees in service industries, the picture varies, and a clear east-west differentiation is not discernible. Metropolitan regions in particular have more than 250 employees (or even more) per 1,000 inhabitants, while peripheral and rural regions have a lower rate with less than 175 employees per 1,000 inhabitants (BBR, 2005). In 2003, in terms of the primary sector, agriculture, forestry and fishing accounted for only 1.1 percent of Germany's gross domestic product (GDP) and employed only 2.4 percent of the population, down from 4 percent in 1991. Much of the reduction in employment occurred in the eastern states, where the number of agricultural workers fell by as much as 75 percent following political reunification. However, the agricultural sector is extremely productive and is the third largest agricultural producer in the European Union after France and Italy. In 2003, services (tertiary sector) constituted 70 percent of the gross domestic product (GDP), and the sector employed 71.3 percent of the workforce: the subcomponents of services are financial, rental and business activities (15.7 percent); trade, hotels and restaurants, as well as transport (25.4 percent) and other service activities (29.2 percent).

Based on this observation, development in the workforce figures according to gender, age and qualifications highlights the specific quality of regional labour markets and their regional competitiveness. On a national scale, male employment rates vary between 80 and 83 percent while the female employment rates vary between less than 60 and 72 percent and more. Estimates for 2020 demonstrate that male employment rates will decrease and remain stable only in the southern part of Germany (Bavaria), while in the other Länder, they will decrease to less than 80 percent. Contrary to the evolution in total male employment rates, female rates will significantly increase up until 2020 by more than 10 percent of the initial 1999 value (BBR, 2005). To conclude on this aspect, it is estimated that on a national scale, few western and southern regions will gain more employees by 2020, while east Germany in

particular will in general lose large numbers of employees; the only exceptions to this are the wider Berlin-Brandenburg region as well as a few clusters such as Dresden, Leipzig and Erfurt; they will lose only insignificant numbers of employees compared to other regions by 2020 (BBR, 2005).

Regional economic competition depends on its GDP, its degree of innovation and its number of highly qualified employees. If one takes these three indicators into account, neither a west-east nor a simple urban-rural gradient can be detected. The southern regions in Germany in particular demonstrate high rates of highly qualified employees; indeed, the general level of qualification tends to be higher than in other regions. Highly urbanized regions, mainly metropolitan regions, therefore offer the highest innovative potential, while peripheral suburban regions hold manufacturing potential. This division of labour is most visible in Bavaria and Baden-Württemberg (BBR, 2005). Contrary to the positive level of competition over the last 5-10 years in southern Germany, East Germany in particular lacks a growth rate in R&D activities in order to solve its widespread economic competition problems.

Few employment opportunities, shrinking growth rates and generally disadvantaged circumstances in East Germany have led to an ongoing brain drain from east to west. This process has therefore accelerated regional decline and led to a further loss in job opportunities, especially in manufacturing, trade and industrial production; this has led to substantial east-west income imbalance (Bade, 2006).

Based on the premise that metropolitan regions are considered to be the centres of innovation and therefore contain a high density of R&D with its adjacent milieus, inter-regional competition will increase before it declines. Economic prosperity is nevertheless based on efficient transportation and ICT infrastructures, and might in the course of time allow for innovation within metropolitan regions. While the western-based metropolitan regions already had high-class and efficient transportation and ICT infrastructures, emerging metropolitan regions in east Germany such as the Saxon Triangle (Leipzig/Halle, Dresden and Zwickau-Chemnitz) in the state of Saxony and Berlin-Brandenburg, were initially forced to establish and renew this infrastructural and technological foundation from 1990 onwards. Although the basic infrastructure has now mainly been provided and put in place, the major control functions as well as the familiar global financial functions remain in Frankfurt on Main, Munich and a few core regions of west Germany. These factual imbalances in various fields are therefore subject to different regional and urban policies, designed to tackle this regional imbalance.

The Federal Government has several instruments to influence regional development. The most important is the financial equalisation among the Länder (*Länderfinanzausgleich*).

The system of financial equalisation among the Länder is supposed to reduce the differences in income among the Länder. Less prosperous Länder receive adjustment payments. These payments are funded by the wealthy states. The system of financial equalisation among the states ensures that fiscally weak states also have adequate financial resources to fulfil their tasks and develop their sovereignty. Aligning the revenue of the Länder is intended to create and maintain equal living conditions for the entire population in all parts of Germany.

1.5.2 Demographic development in Germany

The most significant demographic changes in the last years are taking place along an east-west divide. While West Germany has experienced mainly positive developments, registering approximately 1.5 to 7.5 percent growth rates, East Germany, apart from the core cities of Berlin and Leipzig, which have enjoyed an almost balanced development, has recorded a negative demographic development in the region of minus 1.5 percent and more than minus 5 percent population growth. The north-eastern parts of Germany in particular (including the states of Brandenburg, Mecklenburg Western Pomerania and Saxony Anhalt) have a high growth rate of elderly people aged 75 years and upwards (BBR, 2005). Regional ageing, a rapidly growing rate of death surplus and the migration of qualified young people from east to west lead to what can generally be regarded as shrinking regions in East Germany and growing and booming regions in West Germany.

Apart from the east-west differentiation, it has to be highlighted that on a smaller scale, demographic processes of shrinkage might occur in parallel processes of boom and prosperity. While rural and peripheral regions demonstrate constant demographic decline, predominantly metropolitan regions seem bound to sustain either stable demographic evolution or significant growth rates over the course of the near future. Nevertheless, metropolitan regions are confronted with growing regional development on their peripheries. New growth poles (Burdack, 2005b; Aring, 2001) have led to fundamental rethinking of transportation infrastructures, housing costs and ecological solutions. The term post-suburbanisation demonstrates that multi-layered suburbanisation processes have enriched the suburban regional structure and thus raised questions as to the emergence of new functional structures within metropolitan regions. These processes have resulted in politically inspired forms of governance such as the 'Initiative Body for Metropolitan Regions' (*Initiativkreis Metropolregionen*), a national association that caters to the needs of metropolitan regions.

Looking at the age structure on a national level, it is obvious that in the late 1990's especially, the number of school children declined heavily (around 20 percent) and will continue to do so (around 33 percent by 2005). So the basis for further demographic development is missing, weakening the regional demographic structure in the long run. In parallel with demographic dwindling, the national demographic structure is also heavily shaped by a large volume of internal migration, mainly from east to west. Between 1989 and 2004, around 3.5 million people migrated from east to west and in doing so, produced severe regional disadvantages and growing regional imbalances between east and west Germany, but also within East Germany, for example, compared to the few centres of metropolitan regions such as Berlin, Leipzig and Dresden (BBR, 2005). Migration from abroad amounted to 13 million people, but also 9 million people left Germany between 1990 and 2004 (op. cit.).

To sum it up, significant demographic changes such as population ageing, negative death surplus, a decline in young family households and an increase in elderly single households, in combination with an ongoing internal east-west migration, have contributed to intensifying regional demographic disparities on a national scale and have thus led effectively to unequal living conditions in Germany.

1.6 National policies concerning the knowledge and creative economy

1.6.1. Knowledge economy

As mentioned before, in the Federal Republic of Germany the Länder are largely responsible for R&D policy, university and education policy. At the moment Germany spends 2.5 per cent of the GDP on R&D which is less than the US, Japan or Sweden and many other industrial countries spend on R&D (BMBF 2006a xy; Schavan, 2006 xy). However, the national government tries to support the development of new technologies through several initiatives. One example in this respect is the ‘High-Tech-Strategy’ (2006). One aim of the initiative is to reach the goal of spending 3 per cent for R&D in the year 2010, how it was agreed upon in the Lissabon-Strategy. The biggest amount of the ca. 14.6 billions Euros in the years 2006 to 2009 will go into research and development of new technologies in 17 high-tech-areas like ITC, biotechnology, aerospace, energy, optical instruments etc. (BMBF, 2006b xy).

Another example is the ‘Initiative for excellence of the federal state and the Länder’ (*Exzellenzinitiative des Bundes und der Länder*) which aims at promoting high quality research at the universities. The universities will be supported by 1.9 billion Euros, two third of the amount is financed by the federal state. Especially selected universities will receive 21 million Euros per year for the next five month. Two of the selected universities are in Munich, the university of Munich (LMU) and the Technical University (TU), the third university is the university of Karlsruhe (BMBF 2006c).

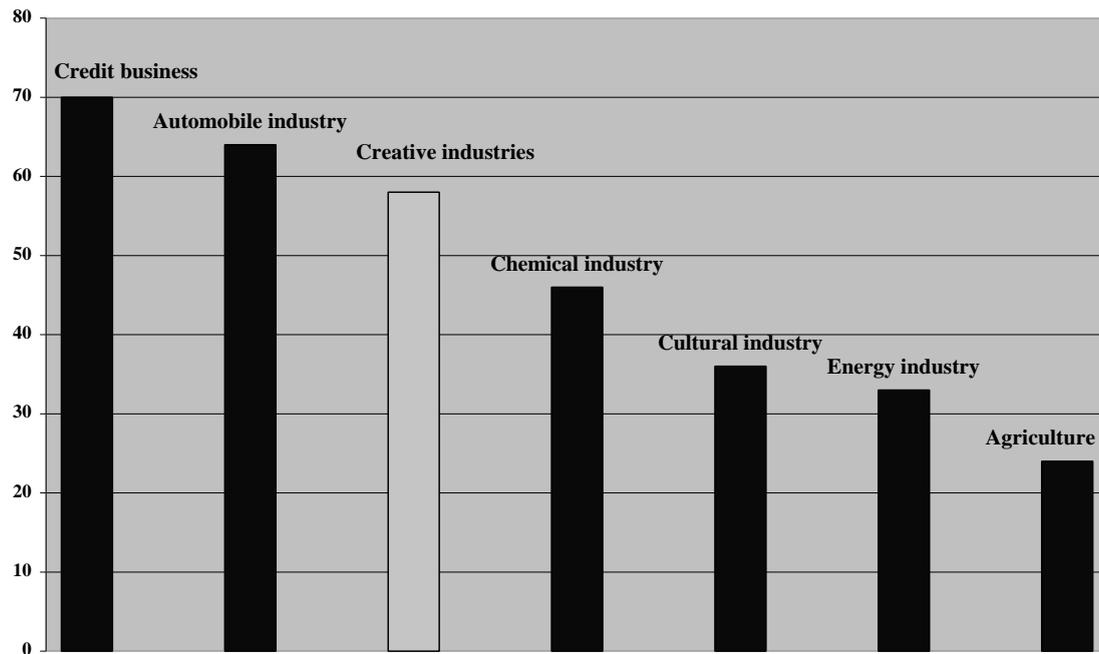
1.6.2. Creative economy / Creative industries

Due to the federal system, the Länder (states) are also largely responsible for policies concerning culture, art, film and the media. Therefore, culture as a distinct field of national policy has only been discovered and developed in the last years: the position of a state secretary has been established in 1998 and from this time on, not only culture but also topics such as cultural economy and creative industries appeared on the agenda of the Bundestag (German parliament). Furthermore, the federal states and some bigger cities have detected creative industries as a strategic field of action and have systematically begun to evaluate these branches of industry. 13 reports on the status of the creative industries in have been generated by some cites and federal states (Aachen, Bremen, Nordrhein-Westfalen, Mecklenburg-Vorpommern, Bayern, Sachsen-Anhalt, Niedersachsen, Schleswig-Holstein, Hessen, Berlin, Hamburg, Baden-Württemberg) until March 2007. The German parliament has initiated a committee on Culture and the Media as well as a so-called “Enquete-Kommission ‘Kultur in Deutschland’” (Committee for Culture in Germany) which focuses on the development of national statistics on these sectors as well as and on the cultural industries as a location factor.

In most of the German statistics and reports the definition of the sector is according to international definitions of the cultural industries. It includes publishing, film- and radio, art, music, journalism, museum, architecture, design, software games and advertisement. Some national data has recently been published in the report on “Kulturwirtschaft 2006” by the

Friedrich Naumann Stiftung and the “Büro für Kulturpolitik und Kulturwirtschaft” (Fesel 2007).

Figure 1.4: Gross value added of the creative industries compared to other industries in Germany 2004 (in billion Euros)

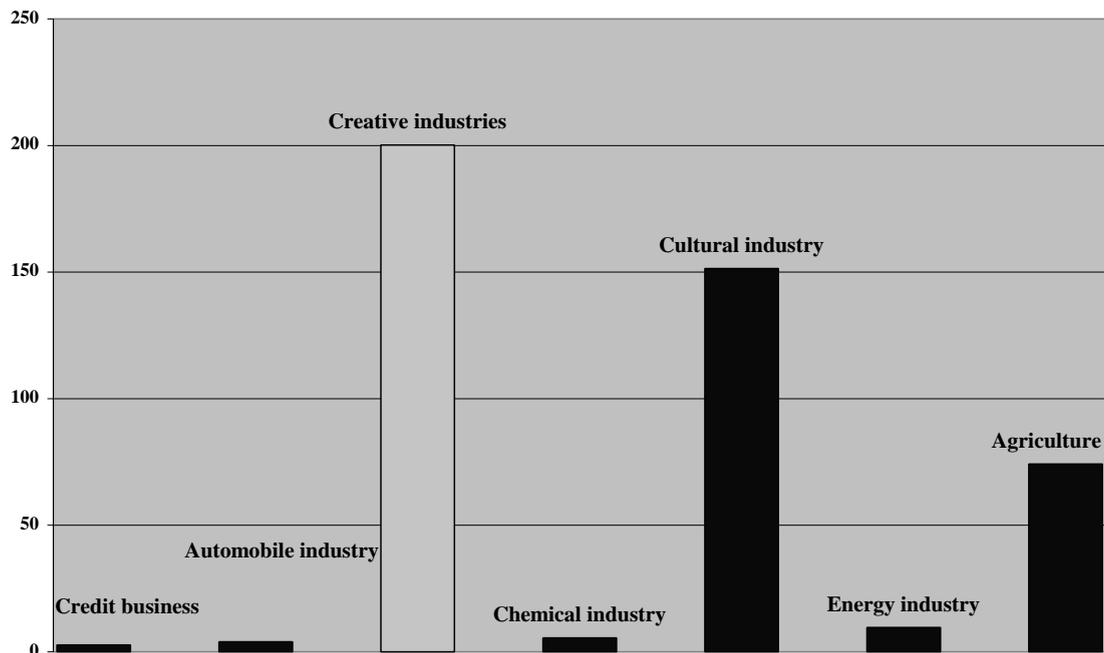


Source: Söndermann 2007, p.12

According to this report¹ the German creative industries had a turnover of 117 Billion Euro in the year 2004. The yearly growth rate had been 2.2 per cent in the years 2002 and 2003. Especially design (6.4 per cent) and software and games industry (11.4 per cent) contributed to this growth. 151.000 enterprises have been registered in this segment in 2004. Most of these companies are very small and consist of one to five persons. It is estimated (Söndermann 2006, p. 14) that more than 210.000 businesses operate in creative industries with a yearly turnover of less than 17.500 Euro which are not registered in any statistics. As figure 6 shows, the structure of enterprises in creative industries differs significantly from that of other economic fields. It has to be acknowledged that comparable statistical data are not available and that highly aggregated data often are based on individual estimations.

¹ Please note that this data cannot be compared to the data presented in chapter 5 as the data sources are different.

Figure 1.5: Enterprises in the creative industries in Germany in comparison to other branches in 2004 (some data is based on estimations) (in thousand)



Source: Söndermann, 2007, p. 16

Coherent statistical data on the national level which would allow international comparisons has not been established yet. Most of the federal states opt for setting up an international comparable statistical framework that would enable inner state cross-sectoral comparisons. Based on these statistics policy strategies could then be established and promoted by the national level. Nevertheless, the newly established “Bundeskulturstiftung” is a first institutionalised framework that promotes creative projects and resources on the national and international level.

To sum up: Germany has a decentralised settlement structure which was and is further intensified by the federal structure. This means the each state has its own capital with administrative, governmental as well as cultural functions, like for example Munich for Bavaria. Furthermore, several city regions in Germany were able to specialise in certain international metropolitan functions – Munich has become a centre for research and development, the high-tech industry as well as the media.

Regarding the economic development of the last 20 years, the southern states of Germany, especially Bavaria and Baden Württemberg, experienced lower unemployment rates, higher economic growth as well as more investment in R&D than the other German states.

Concerning the stimulation and support of the creative knowledge industries, the national influence is severely limited due to the fact that the Länder (states) are bearing responsibility for the fields of policy of research and development, education as well as the

media. However, two universities in Munich have recently profited from a newly federal state funded programme which aims at promoting high quality research at the universities.

2 THE CONTEXT: BAVARIA, UPPER BAVARIA AND THE MUNICH REGION

The following chapter describes the regional context of Munich. After introducing its administrative organisations, the economic and demographic development of Bavaria and the district of Upper Bavaria, the basic characteristics of the Munich region will be discussed. Finally the region of Munich will be categorised in the European as well as the global city system. Munich is the capital of the Free State of Bavaria (*Freistaat Bayern*). Bavaria forms the southernmost state of Germany. It shares international borders with Austria and the Czech Republic as well as with Switzerland (across Lake Constance). Bavaria is the largest state (70,553 square kilometre) in the German Republic. It is second only in population with 12.4 million inhabitants after Nordrhein-Westfalen (Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology, 2007).

2.1 The Administrative units: Bavaria, Upper Bavaria and the Munich Region

2.1.1 Bavaria and Upper Bavaria

The Free State of Bavaria is classified as a NUTS-1 region, and consists of seven administrative districts (*Regierungsbezirke*): Lower Franconia (*Unterfranken*), Upper Franconia (*Oberfranken*), Upper Palatinate (*Oberpfalz*), Middle Franconia (*Mittelfranken*), Swabia (*Schwaben*), Lower Bavaria (*Niederbayern*) and Upper Bavaria (*Oberbayern*) (see figure 2.1).

Figure 2.1: Administrative units of Bavaria



Source: Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology, 2007

These administrative districts are classified as NUTS-2 regions. These districts are territorial corporations of communal public law. The district in Bavaria is the third level of communal government; the first is the municipality and second the county. The districts are autonomous bodies and have their own Parliament, the *Bezirkstag*. The district of Upper Bavaria, governed from its central offices in Munich, is responsible for decisions in the fields of social issues, health issues, culture and preservation of heritage, for education, the waterworks and for subventions of certain sections of the economy. Upper Bavaria has 4,15 million inhabitants, almost 34 percent of the population of the State of Bavaria and consists of about 25 percent of the territory of the Free State.

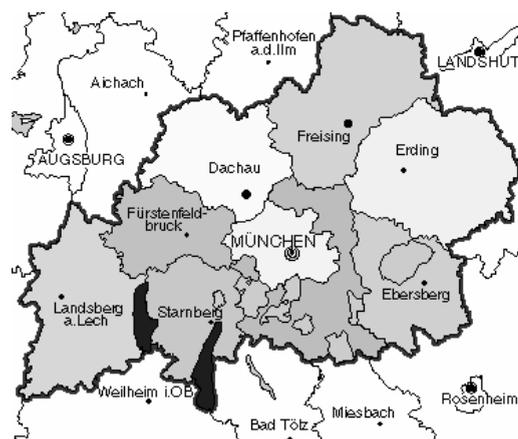
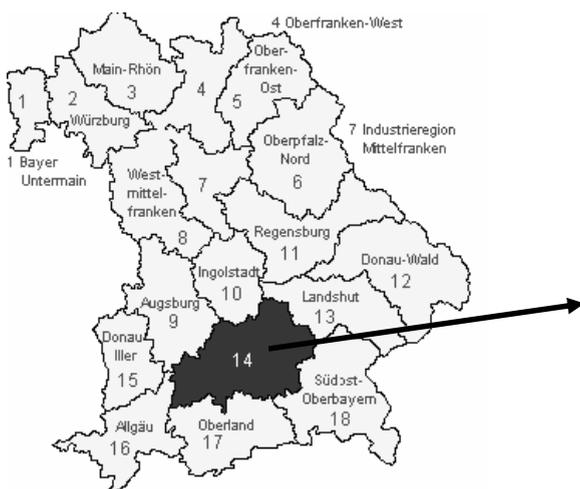
Bavaria was divided into 18 planning regions, during the 1970s, in order to establish a balanced regional planning system. The regions are planning areas, in which the Bavarian State Development Program (*Landesentwicklungsprogramm*) intends to develop or obtain balanced living and economic conditions. The 18 different Regional Planning Associations set up regional plans.

2.1.2 The Munich Region

The regional planning association of the Munich region encompasses not only the City itself, but also the surrounding counties (*Landkreise*) of Dachau, Ebersberg, Erding, Freising, Fürstenfeldbruck, Landsberg am Lech, München and Starnberg (see figure 2.2 and 2.3). With a surface area of 5,504 square kilometres, it is the second largest of the 18 Bavarian planning regions. With a population of 2, 4 million, it is also one of the most densely populated regions in southern Germany. The region is strongly oriented toward the state capital. The city of Munich with a surface area of 310 square kilometres, makes up only 6 percent of the planning region, but almost 50 percent of the regional population. 1,247 million people (31.12.2000) live in this area. Approximately 60 percent of the total workforce (subject to social insurance contributions) of the region, has its place of work inside the city limits (1,026,330 workers).

Figure 2.2: Bavaria's 18 Planning Regions

Figure 2.3: The Regional Planning Association of the Munich Region



Source: *Regionaler Planungsverband München, 2006*

The following report will not be in reference to the City of Munich but instead be focused upon the area of the planning association 14, namely the planning region of the region of Munich.

2.2 Economic and Demographic Development in Bavaria and Upper Bavaria

The economic structure of Bavaria today is widely diversified. In concert with global players like Siemens, BMW, Audi, EADS, Adidas-Salomon, and MAN, is a tightly knit net of small and medium sized businesses in industry, handicraft and service sector. Bavaria first developed from an agricultural to an industrial country, after World War II, and is today one of Germany's strongest economies. The gross domestic product represented 385,156 billion Euros in 2004. Bavaria had with 61,870 billion Euros the third largest per capita gross domestic product in Germany behind the city state of Hamburg (75,963 billion Euros) and Hessen with 65,195 billion Euros (the German average is 56,631 billion Euros) (Statistisches Bundesamt, 2006). The Bavarian gross domestic product rose, between the years 1995 and 2004, 28.4 percent, more sharply than in any other German State. The nominal growth of business strength also climbed by 98,6 billion Euros, in the same time span, to a total of 403.7 billion Euros, which also propelled the Free State of Bavaria to the pinnacle of the statistics (Statistisches Bundesamt, 2006). Almost 18 percent of the total gross national product of Germany of 2,245 billion € is produced in Bavaria, although its citizens make up only 15.1 percent of the entire German population (LH München, 2005a). A break down of the gross value added divided into economic sectors is shown in the following table 2.1:

Table 2.1: Share of economic sectors on the gross value added 2004 in Bavaria and Germany

	Bavaria	Germany
Agriculture and forestry (in %)	1.3	1.3
Industry (in %)	29.3	28.1
Tertiary sector (in %)	69.4	70.6
Export quota – Industry (in billion €)	44.9	39.6
Employment quota (employees relating to resident population, Mikrozensus) (in %)	46.9	43.2
Self-employment quota (Self-employment, relating to employees, Mikrozensus) (in %)	11.9	10.8
Rate of unemployment (in %)	6.9	10.5
Rate of youth unemployment (under 25 years) (in %)	7.3	9.9

Source: Invest in Bavaria, 2005

Bavaria is also considered to be a bastion of Germany for the establishment of businesses. In the year 2005 Bavaria booked a positive balance of 38,000, in number of newly founded businesses, which in comparison, was not achieved by any of the other German state. The German states have been plagued by receding employment rates since the mid 1990s. Bavaria is the only exception. It is the only German state which, since 1995, registered a positive balance, creating 17,500 new jobs. In the unemployment statistics, only Baden-Württemberg had a lower unemployment rate with 7.0 percent (2005) than Bavaria with 7.8 percent. Job opportunities for the youth are also very positive. With an unemployment quote

of 7.3 percent Bavaria lies considerably under the national average of 9.9 percent for unemployed youth (Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology 2005 & 2006a). However, Bavaria is characterised with large regional disparities. The Upper Bavarian companies contribute a total of 41 percent of the GDP of the state. The metropolitan region of Munich, alone contributes the largest portion of the state gross domestic product, almost 30 percent (2003), although only 20 percent of the population of Bavaria live there. The figures reveal that the region of Munich is the solitary centre, not only of Upper Bavaria, but also of all of Bavaria (Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology 2006b).

Upper Bavaria's industry is strongly diversified. The most important branches are the automobile sector, machine engineering industry, the chemical industry, radio and news networking technique, and the food industry. The service sector with 256 employees per 1,000 inhabitants lies notably higher than in rest of Bavaria (215 per 1,000) and West Germany (214 per 1,000). Of importance are the services which are oriented to the special needs of the business sectors and free lance occupations. Tourism also plays a major role, and has a major impact in its summer and winter seasons, especially in the southern most region of the Alps and its foothills. With 28 million overnight guests (2001) Upper Bavaria is the largest tourist region in Bavaria (38 percent), as well as in all of Germany (Invest in Bayern, 2007a). The economic dynamics of Upper Bavaria are also documented in the above average high rate of free lance workers of 14 percent (2003) (Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology 2005b). The unemployment rate in Upper Bavaria was 5.6 percent in January 2007. This is below the Bavarian average of 6.6 percent and far below the national average of 10.7 percent in 2006 (Regierung Oberbayern, 2007).

A prognosis based on an analysis of the Prognos AG (Atlas of the Future 2006) for Bavaria and especially for the region of Munich, forecasts a competitive and future oriented economy. The city and the county of Munich, as well as its bordering county of Freising, have a high concentration of enterprises (above the national average) of leading business sectors (for example machine engineering, automobile assembly, chemical, electric and medicine industries, as well as instrumentation and control technology like logistics, the IC-technologies and business and consulting services). A highly specialised business sector is also present in the Bavarian counties and cities of Dingolfing-Landau (automotive industry), Regensburg and Nürnberg-Fürth-Erlangen. Regions in Bavaria, which have a lower concentration of enterprises of leading or high-tech business and growth sectors are the counties and cities in Upper Franconia, in the region Upper Palantine and in Lower Bavaria, in the cities of Hof, Wunsiedel, Regen and Freyung-Grafenau. These are the regions which formerly bordered on the earlier east block countries of the Czech Republic and the German Democratic Republic. These periphery regions were and are still, generally, characterised by the loss of their dominant old industries like the textile and porcelain industry. They are the structurally weak regions of Bavaria with high unemployment rates, and suffer further through the loss of, especially the young, highly qualified and potential workers, who are migrating to the economic prospering regions.

The administrative district (*Regierungsbezirk*) of Upper Bavaria is not only the largest in Bavaria in terms of land mass, and strongest in terms of economy. It also has the largest population. Upper Bavaria has a population of 4.24 million, almost 34 percent of the total population of Bavaria. Its borders cover approximately 25 percent of the surface of the state of Bavaria (see Table 2.2). The number of inhabitants is growing. Since 1991 the percentage

of the population has risen in Upper Bavaria by 7.5 percent (in the state of Bavaria +6.3 percent). Decisive for this growth was the migration of workers from other German States and out of the structurally weak regions of Bavaria – due to the wide ranging employment opportunities (Regierung Oberbayern, 2007).

Table 2.2: Population, employees (subject to social insurance contributions) and GDP in Bavaria and Upper Bavaria

	Area (km ²)	Population (31.12.2005)	employees (30.06.2005)	GDP (2003 in million €)
Upper Bavaria	17,530	4,238,195	1,575,083	156,196
Bavaria	70,549	12,468,726	4,270,848	375,952
Share Upper Bavaria	24.8 %	34.0 %	36.9 %	41.5 %

Source: Regierung Oberbayern, 2007

2.3 Munich´s (new) geopolitical position in Europe and in the global city system

Through the expansion of the European Union, Munich lies geopolitically on an important axis for old and new regions of development.

The Globalization and World Cities Study Group and Network (GaWC) categorises Munich as a global service centre. The GaWC conceptualises World Cities as Global Service Centres, which are strongly bound together. The access is achieved through globally present service companies and their transnational organisational networks. Cities are the hubs, on which the networks of these international service conglomerates cross. London has achieved the highest networking net value. Munich is one of a total of 123 cities worldwide, which has achieved a value, which is equivalent to over 1/5 of the value of London (Hoyler, 2004). Due to its highly developed service sector, Munich reached such a high standard. Only Frankfurt achieved a higher value in Germany. The headquarters of, by the GaWC considered, service oriented businesses were found in 21 of the 123 most important cities, which revealed a high concentration of leadership and policy making in those cities. London and New York far out distance all other cities in regard to location of business headquarters. In this respect the GaWC categorises Munich as a minor centre of command and Frankfurt as a medium centre (Hoyler, 2004).

In observing models, which pinpoint European economic centres, points of development and outer extremities, Munich lies on the crossroads of different zones of development and on the edge of the central network of the European economic growth corridor to its pan-European extensions and additions.

This strategic position brings not only opportunity for the city, but also danger and risks. Through further growth, the city, already known for its amenities and high price level, could suffer from growth pains.

To sum up: considering the contribution of the Munich region (planning region 14) to the state gross domestic product, it is the solitary centre of the administrative district of Upper Bavaria (Nuts-2 region) as well as of all Bavaria. Upper Bavaria belongs to one of the most dynamic regions of Europe in economic terms. Its economy is characterised by a strongly diversified industry and a high concentration of high-tech oriented firms as well as knowledge intensive business oriented services. In contrast to many other regions in Germany it shows

also a positive demographic development resulting from migration due to the wide ranging employment opportunities of the region.

Considering Munich's position in the global city system, Munich is mostly not ranked as a global city but certainly as a European centre due to its economic strength on the same level of importance with cities like Vienna or Rome which are national capitals.

3. HISTORIC DEVELOPMENT PATH OF THE MUNICH REGION (UP TO 2000)

3.1. Before 1950 (1945)

3.1.1 The beginnings of Munich

Settlement in the Munich area dates back to Roman times, but the city's official year of foundation was 1158 when Guelph duke Henry the Lion founded the city next to a settlement of Benedictine monks, called Munichen. Munich was officially granted city status and fortified in 1175. In 1255, it was chosen as residence by the Wittelsbach family, the dukes of Bavaria who dominated the city right up to the 20th century. The salt-trading monopoly laid the foundations for a wealthy trading city and in 1506, Munich became the capital of the whole of Bavaria. Until the end of the 15th century, life in Munich had been shaped by the bourgeoisie. This situation, however, changed fundamentally with the Age of Absolutism. During the 16th century, Munich was a centre of the German counter-reformation. Politics and the arts were increasingly influenced by the court and the development of Munich was increasingly dominated by the Bavarian rulers who turned the city into the administrative centre of Bavaria. Bavaria emerged from the Napoleonic Wars as the largest German state in central Europe, having been granted the status of a kingdom in 1806. Centralisation of the state administration of Munich brought new inhabitants and new functions to the growing city. Since then the design of its urban architecture embodied and enhanced the prestige of the entire kingdom (Kuhn, 2003a).

3.1.2 Culture and Sciences under Royal Patronage

The upturn began in the 19th century: Under the kings Ludwig I (1825–1848), Maximilian II (1848–1864), and Ludwig II (1864–1886), Munich became a cultural and artistic centre, and it played a leading role in the development of 19th- and 20th-century German painting.

Many of the city's finest buildings originate in this period: Among the neoclassical buildings are those on the magnificent Ludwigstraße and the Königsplatz, built by the architects Leo von Klenze and Friedrich von Gärtner. The Maximilianstraße, which has developed into one of the most expensive and exclusive, shopping miles of Europe, was constructed in Perpendicular style under King Maximilian II (Nöhlbauer, 1993).

The city turned into a major centre of arts under the patronage of Ludwig I and II in the 19th century. Furthermore, the musical heritage of Munich is dominated by Richard Wagner, who composed many of his works for Ludwig I. The young king was a great admirer of Wagner's operas and brought the composer to Munich in 1864. His successors, Richard Strauss and Carl Orff, were both born in Munich. Also, Mozart often performed in the city and Gustav Mahler conducted the world premiere of his eighth symphony here in 1910 (Nöhlbauer, 1993).

However, not only the arts flourished at that time. King Ludwig I and (to an even greater degree) his son Maximilian II encouraged the sciences, too, and consciously invited researchers and inventors to the Bavarian capital. The relocation of the university to Munich and Maximilian II's founding of the Technical University (*Technische Universität*) in 1868 were landmarks of this policy. They gave the city an important advantage for the development of its industries and helped it to compensate for its remoteness from raw materials and transportation routes. Numerous inventors and scientists worked in Munich, including Alois Senefelder, Joseph von Fraunhofer, Justus von Liebig, Georg Ohm, Carl von Linde, Rudolf Diesel, Wilhelm Conrad Röntgen, Emil Kraepelin and Alois Alzheimer. The city's tradition as a centre of research and the applied sciences has its roots in these times.

The city experienced also a growth in population in the 19th century which led to the construction of new quarters: at the beginning of the 19th century, Munich had 40,000 inhabitants, in 1840 already 90,000 and until the 1870s it doubled again. The urban area expanded firstly through planned expansions alongside axes of development and through the incorporations of villages into the municipal area. Quarters like the Max-Vorstadt, the Isarvorstadt or the French Quarter of Haidhausen developed at this time (Kuhn, 2003a; Bauer, 1993).

3.1.3 The industrial development of Munich – the beginnings

In economical terms, industry in Munich was a 'latecomer'. Bavaria was an agrarian region until the second half of the 20th century. The railroad from Nuremberg to Fürth, a new means of transportation built in 1835, linked Munich with markets throughout Central Europe. The railroad was the moving force for industrialisation of the plains of Bavaria. Munich became a European centre for transshipment of merchandise and a transportation junction for Southern Germany (Kuhn, 2003a)

Furthermore, the favourable influence of the Bavarian kings' patronage of the arts and sciences created the conditions for the development of quality industries which capitalised on the new technologies and inventions. So the 19th century tradition of science-oriented industry continues to thrive in the high-tech metropolis of the 21st century (LH München, 2004)

The 19th century was also the time when Munich beer made its way throughout the world. Although brewing beer had been a tradition in Munich since the 14th century – the Hofbräuhaus (the court's brewery) was founded in 1589 – it was not until the mid-19th century that Munich beer first attained its due fame. Here again the railroad played a decisive role in that it gave brewers access to German, European, and overseas markets. The breweries also benefited from the invention of artificial cooling machines by Carl von Linde, a researcher and businessman from Munich. His refrigeration machines revolutionised brewing and encouraged the industrialisation of the brewing business (LH München, 2004).

Industrialisation went along with a massive growth of the population: In 1846, the population of Munich was about 100,000 and by the turn of the 20th century the city had more than half a million residents. So this was also the time of severe housing shortage and dissolution of the compact city into the surrounding area (Kuhn, 2003b).

3.1.4 1900 until the end of World War II

Particular economic and cultural prominence was gained by the city in the period before World War I. Munich, and especially the district of Schwabing, became the domicile of many artists and writers. Thomas Mann's comment about this period was 'Munich shone'. In 1911, Munich found itself at the forefront of the new Expressionist movement. 'The Blue Rider' (Der Blaue Reiter), a group founded by Russian-born Wassily Kandinsky and Munich-born Franz Marc, is considered of seminal influence in the development of modern art. Today, an extensive collection of paintings by the group 'Der Blaue Reiter' is exhibited in the Lenbachhaus in Munich. The city was also a home for painters like Paul Klee, Alexej von Jawlensky, Gabriele Münter, August Macke and Alfred Kubin and for numerous writers like Rainer Maria Rilke and Frank Wedekind (Nöhlbauer, 1993).

Munich was not heavily destroyed during World War I, but the economic collapse posed severe problems for the population creating a fertile ground for Adolf Hitler's National Socialist movement. In 1923, Hitler failed in his attempted Munich 'beer-hall putsch'—a coup aimed at the Bavarian government. Despite this fiasco, Hitler made Munich the headquarter of the Nazi party, which in 1933 took control of the German national government. Many 'Führer-buildings' ('*Führerbauten*') were built around the Königsplatz, some of them have survived to this day. The Munich Agreement was signed in Hitler's headquarter next to the Königsplatz by representatives of Germany, Italy, France and Britain in 1938. This agreement ceded the mainly German-speaking regions of Czechoslovakia, called Sudetenland to Germany (LH München, 2004a).

Furthermore, Munich was the basis of the 'White Rose' ('*Weißer Rose*'), a non-violent resistance group of students that formed an opposition movement from 1942 to 1943. The core members were arrested and executed following a distribution of leaflets by Hans and his sister Sophie Scholl at Munich University. Today, the name of the square where the central hall of Munich University is located is 'Geschwister-Scholl-Platz' and the square next to it is called 'Professor-Huber-Platz'. Huber, professor of the University, wrote White Rose's sixth and last leaflet calling for an end to National Socialism. Huber was also executed in 1943. The 'White Rose' has become subject of many artistic works, including an acclaimed opera by the composer Udo Zimmermann (Bald, 2003).

In World War II, Munich was heavily bombed and nearly half of the city was in ashes by the end of the war. Especially the old town and the neighbouring quarters were hit heavily: more than three quarters of these city parts were destroyed (Schröder, 2003). The population number dropped from 824,000 down to 479,000. As a result of a decree by the US occupying forces in September 1945 (albeit without Palatinate), the Free State of Bavaria was reconstituted after the Second World War. Today's Bavarian constitution was adopted in a plebiscite held in December 1946. At the same time, the first post-war Bavarian parliament was elected. The federal states took precedence in the political reorganization of Germany, and even after the creation of the German Federal Republic in 1949 the states were able to retain their independent rights (LH München, 2004a).

3.2. Reconstruction and Economic upturn: the period from 1945 - 1980

3.2.1 Beginning of Munich's rise to an economic and industrial centre

Large parts of Munich were destroyed during World War II. After the American occupation in 1945, the City Council of Munich decided in favour of a tradition-oriented reconstruction which preserved its pre-war street layout and aimed at the reconstruction of the historical city centre. Unlike other German cities, the cityscape of Munich had not been altered greatly by the industrial development before the destruction in the war. The so-called 'Munich way' combined the rebuilding and preservation of traditional structures, on the one hand, with future-oriented planning, on the other. The result decisively contributed towards the restoration and preservation of the historical cityscape (Heigl & Schmitt, 2003).

Not until 1945, the city's rise to an internationally acclaimed economic and industrial location began. This 'mercy of late industrialisation' spared the city the difficult task of dealing with structural economic change, which typically appeared in other areas with economic emphasis on industrial branches such as coal mining, steel production, or ship-building and had to be managed in the cities of the Ruhr area, for example (Häußermann & Siebel, 1987).

In the post-war period, Munich had special location advantages which formed the basis for the later dynamic of the economy. The number of companies in consumer and investment goods industries was high, and the service sector, which comprised public administration, arts and sciences, the media and financial system, was already well-developed.

With increasing importance of research and science for technological developments, the traditionally well-developed scientific sector in Munich provided good preconditions for a modern industrial structure (Biehler et al., 1994.). Since vast areas on the urban fringe of Munich were undeveloped, the city had major development areas at its disposal. Economic activities could develop there and at the same time, centrality of the city could be displayed.

The transfer of Siemens administration and production from Berlin to Munich was a decisive event in the economic development of Munich. It created an important nucleus for the allocation of other German and international companies (Häußermann & Siebel, 1987). A positive development began in the traditional industrial branches of Munich, such as food industry, brewing and textile manufacturing as well as in mechanical and automobile engineering some years later. In the mid-1950s, the rescue of BMW which nearly went bankrupt and the foundation of the MAN-branch at the Northern boundary of the city was of special importance for this positive development. A special dynamic was created in Munich by photo- and optical, precision engineering industries (for example Rodenstock) as well as by the extension of the aerospace and armaments industry (Krauss-Maffei). The publishing, printing and duplication industries took up a strong position in Munich, too (Fritsche & Kreipl, 2003).

Another important factor for the economic rise of Munich was the immigration of approximately 150,000, partly highly qualified, ethnic German repatriates and refugees after the Second World War. Enterprises in Munich could rely on an ample and qualified labour pool (Fritsche & Kreipl, 2003).

Munich with its high leisure quality also provided exceptionally positive soft locational factors, which gained in importance with increasing wealth and a growing share of technoscientific intelligence (Bieher et al., 1994). The city was already equipped with 'soft' location factors such as arts, culture, landscape, available land for housing etc. (Biehler et al., 1994). The combination of attractive employers and the image of Munich as a city of arts and culture made it easy for the companies to attract highly qualified employees and academics from the entire German territory (Biehler et al., 1994). The peak of a period of 25 years of unbroken economic growth was reached with the Olympic Games, which took place in Munich in 1972. Because of the allocation of the Games to Munich in 1966, and due to the financial support by the federal government and the state of Bavaria, the goals of the urban master plan of 1963 could be realised in a much shorter period of time. In the course of planning, the first metro stations were opened, a regional railway network was developed and the so-called Middle Ring Road (*Mittlerer Ring*), a circular motorway around the inner city, was opened. The Olympic Games, however, also marked a temporary stop of the economic upturn. The 'Golden Years' ended with the oil crisis in 1973. A new period of economic growth began not until the 1980s (LH München, 2004a).

3.2.2 Laying the foundations for Bavarian technology policy

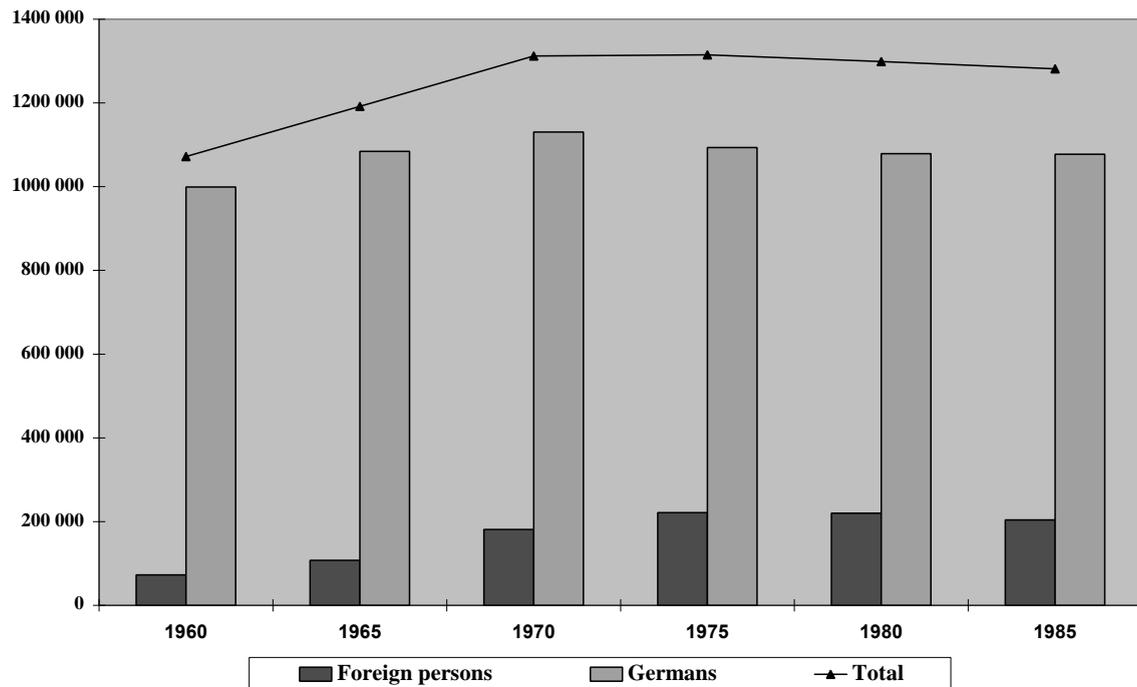
In the period between 1955 and 1967, German technology policy tried to give impulses so that the German economy could reach world standard in research, for which the US were taken as model (Sternberg, 1995). The reconstruction period after World War II was seen as a chance for guiding structural change which was actively supported and strengthened by political measures (Ziegler, 2003). The especially dynamic development of the high-tech-industries in the South of Germany is also the result of a well-directed policy predominantly pursued by representatives of the 'under-industrialised' state of Bavaria and concentrated on by the conservative party (CSU) (Häußermann & Siebel, 1987). In technology policy, locational decisions were decided in favour of the region of Munich in the 1950s and 1960s. Several federal research and development institutions, which were founded at the time, belonged to the field of nuclear and/or armaments research and owed their allocation in Munich indirectly to the influence of the temporary Minister of Defence (1955 – 1956) and long-working Prime Minister of Bavaria (1978 - 1988) Franz Josef Strauß (CSU) (Sternberg, 1995). This is how the development of Munich to a centre of modern high technology – to a 'Municon Valley' – owes its economic success after the mid-1980s in the end to a large extent to technology and arms policy (Castells & Hall, 1994).

3.2.3 Population development and change of social structure

The population of Munich rose by 50 percent between 1945 and 1950 (Bailey, 1980). The strong population growth mainly resulted from migration gains. After the war, refugees and ethnic German repatriates came from the Eastern territories of the former German Reich. Since the 1950s, the rapid growth of the economy, the so-called 'economic miracle' ('Wirtschaftswunder'), caused a labour shortage especially in industrial centres like Munich. Therefore, guest workers from Turkey, Greece, Yugoslavia, Italy and other countries, who could be used in factories and public service companies, were recruited. Despite the

recruitment stop in the 1970s, the number of employed guest workers and their families was 10 percent of the total population of Munich in 1980 (Bailey, 1980).

Figure 3.1: Population development in Munich



Source: LH München, 2000a

As a result of population growth and economic upturn, a shift in the social structure was initiated: Munich became attractive mainly for the economically active population (18 to 60 years), especially in tertiary professions and with active working orientation. Although the city exhibits an extremely high spending power, the share of the poor population increased simultaneously during this period (Klingbeil, 1987b).

3.2.4 Housing market: Private acquisition of property and large social housing estates

The sharp population development caused a housing shortage and a huge demand for housing. Although reconstruction was considered more or less completed in 1958 – 134,500 apartments had been built since the end of the war, among them 40 percent with the help of public funding – no relief was brought to the housing market of Munich. On the contrary, the lack of housing grew persistently due to continued high migration gains. The need for action was immense and therefore, the City Council decided on a comprehensive plan to solve the housing shortage. In 1960, the First Munich Plan (*‘Erster Münchner Plan’*) was adopted which aimed at building at least 48,000 publicly funded apartments by 1966 (LH München, 2004a). Furthermore, its declared purpose was to facilitate the building of 75,000 privately financed apartments. Whole districts were developed – such as Neuperlach, Hasenberg and Fürstenried-West. Central architectural ideas of a functionally structured and dispersed city formed the urban design of these housing estates at that time. Multi-storey blocks were

separated by greenery and placed isolated in vast open spaces. The declared quantitative goal of the new housing development was reached with a two-year delay, but in terms of the housing shortage, it was no far-reaching remedy. The creation of new jobs in the suburbs also caused new spatial concentrations, for example in Arabellapark and Neuperlach (Klingbeil, 1987a). Beside the new spatial concentration and the building of large social housing estates, the tendency towards owner-occupied apartment housing caught on in the 1960s. In the 1950s, political support for single family homes and the creation of private property had dominated. This period was followed by a new housing policy. The new development was welcomed by the city because owner-occupied apartments consume less space in comparison with single or multi family houses, and due to effects of higher housing density a better utilization of the infrastructure was possible. In the period before 1960, owner-occupied apartments were mainly created in the central residential areas which represented a high social prestige, such as Schwabing, Bogenhausen and Nymphenburg-Gern. After 1960, the exclusive residential areas in outer districts, such as Harlaching, Solln and Prinz-Ludwighöhe, were also integrated and since the 1970s, the building of owner-occupied apartments has spread to all districts (Klingbeil, 1987a). The new housing developments, which were created before the Olympic Games of 1972, were mainly situated between the radial commuter motorways. This caused an extremely high building density in Munich: In 1979, the Bavarian capital showed with 42 inhabitants per hectare the highest density in comparison with other larger cities in the Federal Republic of Germany.

Although population had not grown since 1972, there was a persistent shortage of housing in Munich. This was mainly caused by the rising average living space per person and the increase of small households which small flats were not sufficiently provided for. For urban planning this meant that even with a constant number of population, more apartments as well as urban developments had to be built. Infrastructure, too, had to be constantly expanded without having to supply more inhabitants in total (LH München, 2004a).

Modernisation and reconstruction of pre-World War II housing did not represent a major problem in Munich compared with other agglomerations, especially other old industrialised regions. Since Munich had not developed into a heavily industrialised metropolis during the Gründerzeit period (1872-1900), only a few working class areas had developed, which can be widely found, for example, in Berlin or the Ruhr-area (Klingbeil, 1987a).

3.2.5 Divergence between Munich and its suburban areas

Since the 1950s and 1960s, divergence between Munich and its suburbia can be noticed. Due to selective immigration and inner city flight which began in this period (suburbanisation), inequalities between Munich and its suburbs can be observed in terms of their population structure. In the city, the percentage of singles, employed, pensioners, foreigners, inhabitants with high income and single-person-households is higher than in the suburbs. In contrast to this, the share of married couples, children and young persons as well as indigenous population and inhabitants with middle to higher income is higher in the suburbs than in Munich (Heinritz, 1987).

The expansion of roads and public transportation leads to strong intraregional infrastructural interconnections between Munich and its suburbs. This allowed for a strong

growth in employment in Munich and also in the surrounding communities and for a growing division of labour between Munich and the suburbs (Fritzsche & Kreipl, 2003). This and an increasing shortage of available land in Munich caused a growth of tertiary economy and a loss of employment in manufacturing in the urban territory.

Since that time, a strict distinction between urban and suburban areas in terms of regional economical contribution is hardly possible any more (Fritzsche & Kreipl, 2003). Whereas in 1970, the share of the secondary sector in Munich was 46 percent, it decreased mainly because of down turn in employment in the building sector after the Olympic Games. The tertiary economy, however, grew by 6 percent in the period from 1970 to 1980 (Klingbeil, 1987).

As a result of the increasing functional interconnections (commuter relations), the 'Regional Planning Association Greater Munich Area' ('*Planungsverband Äußerer Wirtschaftsraum München*') was founded as a voluntary association of 38 communities and towns, Munich and four counties already in 1950 (Miosga, 2003). Since 1972, all regional planning tasks have been represented by the regional planning association for the so called 'planning region 14', which all communities, towns and counties in the agglomeration belong to, as it is regulated by the state planning law. Apart from this planning association, other task oriented associations were formed. The oldest of those is the 'Association for the Protection of Trans-local Recreation Areas in the Suburban Counties around Munich' ('*Verein zur Sicherstellung überörtlicher Erholungsgebiete in den Landkreisen um München e.V.*'), which was founded in 1956 (Miosga, 2003).

3.3 Period from 1980-2000: economic growth and first growth problems

The final 20 years of the twentieth century were years of an abundance of economical growth. In Munich, the driving force behind this economical boom was the so-called 'Municon Valley' with its numerous High-Tech Businesses. Another pillar of growth and guarantee for economical stability was the 'Munich-Mix'. The drastic growth pains of the City's economy were already apparent during the 1980s: the success of the economy lead to a growing polarisation between business interests and the interests of the City population.

3.3.1 'Municon Valley' and 'Munich Mix': guarantees for positive business development

In the 1980s, a new phase of economic growth began. Lower energy costs, due to drastic reductions in the price of crude oil and the increased use of new technologies, boosted the economy. The Gross Regional Product of Munich doubled between 1980 and 1990 (van den Berg et al., 2001).

During the 1980s Munich developed into an international centre for high-Tech products when leading concerns from the United States and Japan opened office there. They found other high-tech businesses in the region around Munich and at the same time important partners for example the German and European Patent Offices, the Technical University as well as other research institutes. In reference to 'Silicon Valley' in California, Munich's high tech centre was dubbed 'Municon Valley' (Fritzsche & Kreipl, 2003). In 1987 there were 1,325 high-tech Companies registered inside the city limits of Munich. Only the City States of

Hamburg and Berlin had higher numbers (Sternberg, 1998). An analysis of the numbers and percentages of newly founded businesses in the high level technological sectors show, that Munich was already, at the end of the 1980s, at the head of the Federal Planning Regions (see also chapter 2.1.2) in these fields². The planning region of Munich, was at the pinnacle of the statistics in the number of research and development businesses, as well as in businesses founded in the technologically intensive service sector, between the years 1989 and 1996. Noticeably high were the statistics of the number of workers in research and development in the High-Tech sector. These statistics reveal how dominant the City and its district were for these sectors and underline the significance of Munich region. In 1987, 20,246 workers were employed, in Munich and its district (*Landkreis*), in this field of business, almost three times as much as the runner up in this sector, the district of Stuttgart. Munich was also at the top of the lists concerning the number of employees in the High-tech field (126,000 employees), ahead of Berlin (99,078 employees). During the 1990s, the Munich region was able to defend its leading position in the High-Tech industry (Sternberg, 1998).

During the 1990s, the Munich region also experienced a major growth period in its Media and IT branches and this led to a boom of overwhelming growth in these sectors. At the same time Munich developed into a bastion for venture capital businesses, attracted by the new businesses in Munich which needed investors to provide the 'risk' capital, to help finance these new ventures. The end of the IT-boom in the year 2000 was felt in the Munich region, yet the Munich economy stood on a broad basis, which protected the city and the region from being susceptible to a major crisis in one sector of business (Fritsche & Kreipl, 2003).

This broad basis and Munich's strength as a business location is based on the diversity of its economic structure and the mixture of global players and SMEs. Munich's modern and balanced economic structure is often referred to as the 'Munich Mix' (*'Münchner Mischung'*). Munich is the headquarters of many large business concerns which include: Siemens, BMW, MAN, Infineon, Epcos, Münchner Rück (Munich Re), and Allianz Versicherung. A large number of vitally strong small and medium sized businesses are also located in the city. The 'Munich Mix' is not only a mixture of big enterprises and SMEs it also refers to the sectional structure of the economy. Next to the diversified spectrum in its service branch, in which research and technical services play a major role in the employment sector, the production and assembly sector of the automobile industry and air and space industries and in the field of microelectronics during the 1980s, reached an advanced level of development through intensive research programs (LH München, 2004a).

There exist many points of interaction between the production and assembly sector and that of the service sector: Numerous intersecting business operations are completed in joint ventures between the networks of these business sectors. Biehler speaks of sophisticated regional complexes: centred around the automobile and machine engineering industry as well as the air and space industry (Biehler et al., 1999, p. 106). The success of these complexes, composed of businesses out of the industrial and service sectors, lies mainly in the cooperation amongst themselves and with businesses out of the measurement, regulation and controlling technology, microelectronics and communication sectors. Each complex consists

² The Federal Planning Regions (*Raumordnungsregionen*) are composed of the German NUTS-3-regions (counties, and city states such as Hamburg and Berlin). They are, with the exception of the city states, large geographically defined areas with functionally defined borders, classified for the use of the reporting districts of the central government. The Federal Planning Regions (*Raumordnungsregionen*) mirror in principle the planning regions of the States, for example the Munich Planning Region (*Planungsregion 14*).

of a central conglomerate (for example: BMW, Siemens, MBB), their cooperation partners for specific product elements (outfitters), their partners in cooperation for the structuring of systems and for microelectronic basis technology (suppliers) as well as partners out of the service sector for private as well as public duties. This organised method of business networking and regional specialization, coupled with the large and open market for employment make these businesses competitive in the World trade markets. This economical success story continues in spite of the ghost of an apparent crisis in the 1990s and the 'bursting of the Internet-Bubble' in 2000 (Fritschke & Kreipl, 2003).

3.3.2 Infrastructure Policies

The Freestate of Bavaria as well as the City of Munich tried to foster economic development through infrastructure provision. Although, projects for the modernisation of the City's streets, traffic management and housing projects had taken place during the 1970s, in light of the Olympic Games in 1972, many decisive location decisions for a modern infrastructure were felt in the 1980s (LH München, 2004a).

At the beginning the 1980s, the decision was made to close the airport located within the eastern city borders at Riem and build a new airport circa 30 km northeast of the City in the Erdinger Moos (Erdings Moor), near the city of Freising. The new Airport opened for business in 1992, and serves today as a hub for Lufthansa and the Star Alliance, through which it gained in international importance. At the same time, the new airport served as a job motor for the region. This also resulted in large number corporations having opened offices around the airport, since its opening (LH München, 2004a).

The relocation of Munich's airport in the Erdinger Moos opened the opportunity for the Munich trade fair to relocate its facilities to the old airport in Riem. The relocation of the fairgrounds, which was bursting at the seams, at the old site, in the district Theresienhöhe, near the city center, was completed in 1998. The new Fairgrounds of Munich developed into a leading European operation with approximately forty fair events for investment, consumer goods, and innovative technologies annually. Over 30,000 businesses from more than 100 countries take part each year in Munich's trade fairs, which offer an important hub for communication for the businesses of the region. These trade fairs attract yearly more than two million visitors from more than 200 countries.

The relocation of the infrastructure of the fairgrounds to the outlying boroughs or city limits opened new possibilities to solving important problems of the prospering city. In the 1980s and 1990s, the chronic shortage of land for new construction sites began to turn into a surplus – not only because of the relocation of the airport and the trade fair. The collapse of the Communist bloc allowed for the closing of military bases and the German Federal Railroad (*Deutsche Bundesbahn*) also shifted its central rail facilities away from the city's core which again offered new opportunities for the tight inner-city real-estate market to expand. Due to these relocations and developments, the city was able to develop new industrial real estate parks and several new neighbourhoods. One project, the Messestadt Riem, is a new neighbourhood with housing for 16,000 residents and jobs for 13,000 people (Reiß-Schmidt, 2003). Today the housing situation is still difficult: a real housing shortage does not exist, but housing is very expensive and cheap housing is difficult to find. The

shortage in the housing market presented an infrastructure problem for the city, during the 1980s and 1990s (LH München, 2004a).

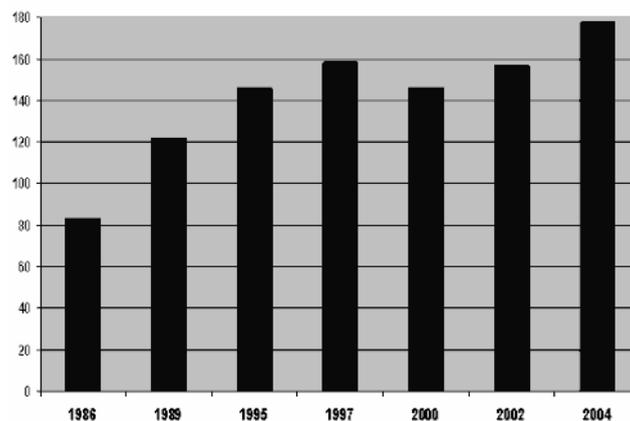
In summary, Munich evolved into a high-tech metropolis within the framework of Bavaria's and Munich's ambitious modernisation and investment policy. In spite of a traditionally split political scene, there was and is an implicit coalition for economic growth in the state capital, although there is no coordinated framework of action. The Bavarian State Government, under a conservative CSU majority, as well as the SPD/Green Party coalition in the city government, are continually focusing their efforts in keeping conditions for economic growth in Munich at the highest level. This includes a modernisation of the infrastructure as well as the projected development of the state capital as a location for prospering business sectors. The initiatives of the city therefore go hand in hand with those of the State Government (Hafner & Miosga 2001).

3.3.3 Demographical development and growing social polarization

In the early 1980s, the city of Munich registered a decline in its population. This changed in 1987. Primarily due to immigration, the population grew again. Unlike the city of Munich, its surrounding boroughs have experienced, over the last 20 years, a period of extreme growth. In the period between the 1960s and the early 1980s, (in the regional statistics) the percentage of the population living in the suburbs increased from around 37 percent to 44 percent. This statistic continued to climb to almost 48 percent in 1993. Munich forms the centre of an urban region of 2,400,000 inhabitants (van den Berg, 2001).

Although Munich profits from its economic prosperity, it is confronted with the problems of poverty and unemployment. The city's report on poverty, from the year 2000, reveals that the rate of poverty rose, in absolute and relative numbers, from the middle of the 1980s to the end of the 1990s. In the period between 1986 and 1997, the density level of poverty in the population (per 1,000 citizens) rose from 83.5 to 163.9 (LH München, 2002a). This statistics reached its summit in 1997, receded in the year 2000 back to 146.9 per 1,000 citizens and since then, has started rising again (Year 2002: 156.7 per 1,000 citizens) (LH München, 2005b).

Figure 3.2: Poor people in the City of Munich 1986 – 2004 (in thousand)



Source: LH München, 2006a

The level of poverty is especially high among foreigners (citizens in the city with foreign passports), as well as among youth and children (LH München, 2006a).

A definitive gap exists in the number of citizens living below the poverty level, between Munich within its city limits and its surrounding counties. In the period between 1995 and 2000, the number of citizens receiving welfare in Munich's surrounding counties, fell from 10 to 9 residents per 1,000. In the same time period, the number of welfare recipients in the city rose from 29 up to 32 per 1,000. These results are mirrored also in the number of those residents who were jobless. In the year 2000, 74 percent or 44,900 of the total of unemployed citizens of the planning region 14, resided in the city of Munich as well as its district. In the outlying counties of Dachau, Landsberg, Starnberg and Fürstentfeldbruck, the number of people registered on welfare totalled 12,000, or 20 percent of the total number of unemployed for the entire Munich region (LH München, 2006a).

A comparison of the employment situation amongst large German cities, reveals though that Munich has a comparatively, relatively low unemployment rate since the middle of the 1990s.

Table 3.1: Unemployment in German cities (annual average in %)

	1996	1997	1998	1999	2000	2005
Berlin	15.70	17.30	17.90	15.9	15.8	19.0
Düsseldorf	11.50	12.20	11.40	9.7	8.5	13.6
Frankfurt	8.50	9.40	9.10	7.2	6.1	10.4
Hamburg	11.70	13.00	12.70	10.4	8.9	11.3
Cologne	13.50	14.40	14.40	12.3	11.0	13.5
Munich	6.50	7.30	6.80	5.3	4.5	8.3
Stuttgart	8.90	9.70	8.70	7.0	5.8	9.4

(since 1997 whole Berlin)

Source: LH München, 2000b, LH München 2005a

In the year 2000, the City of Munich first examined the positive extremes of its income tax system. The poverty level was defined as being under 50 percent of the weighted average of income for a household. The level of prosperity or wealth, was defined as being over 200 percent of the weighted average. An analysis of the statistics for the year 2000, revealed that 12.4 percent of the population, or about 154,000 citizens, met the criteria of wealth in Munich. A comparison of these statistics with the statistics of the total population living under the poverty level of 11.1 percent shows a slight majority of economically privileged in comparison to those living under the poverty level. This statistic is remarkable, in light of the relation of the percentage of poor and rich in the rest of 'West-Germany'. Here the statistics reveal a majority for the poor. These positive statistics can again be seen as a result of the relatively high strength of Munich's industry sector and its practical employment possibilities (LH München, 2006a).

To sum up: Regarding the historic development path of Munich several periods and events can be detected which contributed to the economic position of Munich in a positive way:

First of all, Munich is the capital and the administrative centre of Bavaria since the 15th century. Being also the residence of the Bavarian king and the royal family, Munich profited

heavily from the high investment in the arts, architecture and the sciences. Especially the royal patronage of the sciences in the 19th century was of great importance for the development of quality industries which capitalised on new technologies and inventions (e.g. the media, technical instrumentation). Furthermore, instead of becoming a heavily industrial town, Munich developed into a trading centre and city of commerce – which later on spared the city the difficult task of dealing with structural economic change.

The vote of the city council in favour of a tradition-oriented reconstruction after the massive destruction during World War II preserved the historical cityscape and now contributes to its attractiveness for tourists. Another decisive event was the move of Siemens from Berlin to Munich as it created the nucleus for the allocation of other German and international companies. The reconstruction years marked also the beginning of the Bavarian technology policy especially through investment in R&D as well as in the arm industry.

After the Oil crisis marked a temporary stop of the economic upturn, the Munich region developed into the leading German High tech region during the 1980s and 1990s. The “Munich Mix” – Munich’s modern and balanced economic structure contributed also to the positive economic development of these years.

The economic development was supported by infrastructure policies of the Freestate of Bavaria as well as the city of Munich: crucial measures were the relocation of the airport and the trade fair in the 1990s as this gave the city the opportunity to develop new neighbourhoods.

However, not all groups of the population profited from Munich’s growing economic prosperity in the 1980s and 1990s as growing poverty rates and growing disparities show.

4 CURRENT SITUATION: ECONOMICALLY PROSPEROUS MUNICH AND ITS NEGATIVE CONCOMITANTS

The urban agglomeration and metropolitan regions of the European Union function as ‘motors’ of the European Economy as well as prime nodes of Europe’s world-market integration (Krätke, 2007). According to the OECD (1999) and to Michael Porter (2001), local and regional clusters especially in the field of technology-intensive and knowledge-intensive economic activities have gained increasing importance for successful performance on the world market. Knowledge is thus gaining in importance as an economic resource in comparison with the traditional production factors. In the up-and-coming knowledge-based economy, economic activities are associated to a greater extent with production, distribution and above all the commercialisation of knowledge than in industrial society. The knowledge-based branches of activity within the economy – the high-tech industries and the knowledge-oriented and creativity-oriented services – are the future of Europe.

Due to its concentration of research-intensive industries and knowledge-intensive services, the Munich region has developed into one of the most dynamic and economically prosperous urban agglomerations in Europe. Following a statistical overview, the following chapter introduces the most important knowledge-intensive clusters of the Munich urban region, and the history of their development. Besides the clusters from the creative industries, finance and ICT (chapter 5), they make a significant contribution to the extraordinary competitiveness of the urban region (chapter 4.1). In section 4.2, the consequences of Munich’s economic success are outlined: increasing ‘poverty in prosperity’ and high land prices and rental charges.

4.1 The economic success story continues – Munich’s extraordinary competitiveness

Regional capacities in the fields of innovation activities, research and technological development are increasingly considered as key factors of regional economic success (Cooke et al., 2000; Grotz & Schätzl, 2001; Sternberg, 1999). In the case of Munich, this connection is very evident, as documented by statistical figures.

4.1.1 Economic and Demographic Profile of the Munich region

4.1.1.1 The overall region in the light of statistics

Compared with other agglomerations, the Munich region takes a leading position in economic respects. This is evidenced by indicators such as the gross domestic product, productivity and its development, gross value added of services and tax receipts, as well as purchasing power (see table 4.1 and figure 4.1). Munich’s economic predominance in Germany is attributable to, amongst other things, the high level of employment: in absolute figures, Munich is the second largest employment location in Germany after Berlin. In relation to the population,

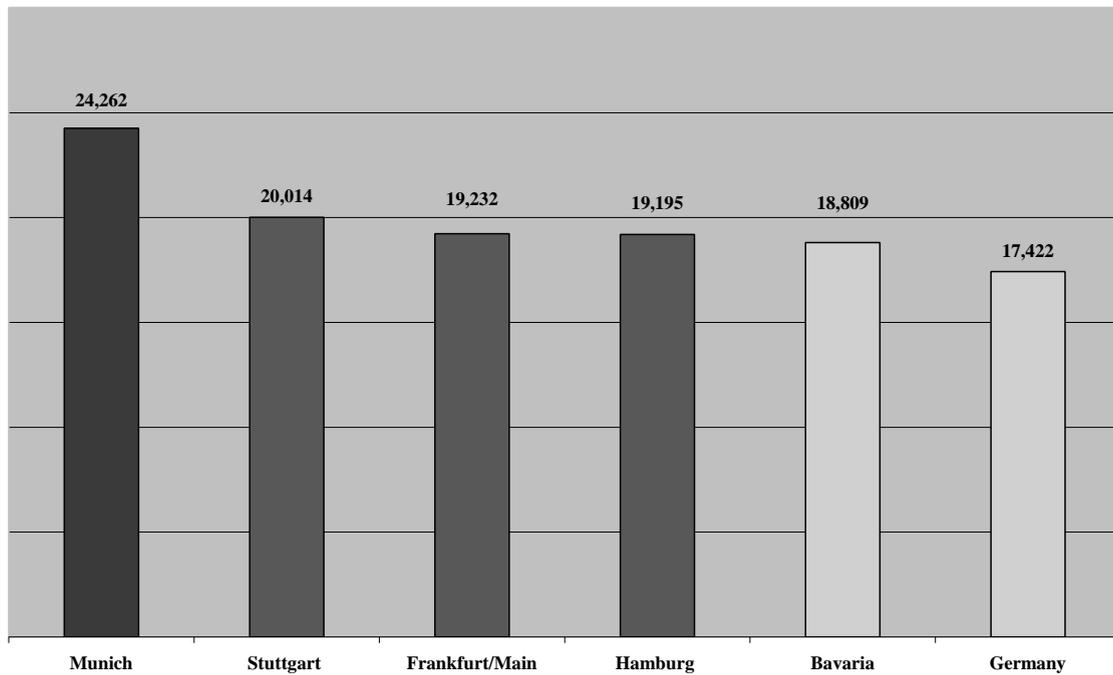
Munich remains the place in Germany with the highest level of employment (LH München, 2005a) (see figure 4.2). Only in the Stuttgart region there were slightly fewer unemployed in 2003. The level of qualifications held by employees is also high. Over 20 percent of employees paying national insurance contributions have a university degree or diploma from a higher education institution (see figure 4.3).

Table 4.1: Munich's economic power compared with other west German urban regions in 2003

	Munich region	Hanover region	Nuremberg region	Stuttgart region	Hamburg region	Berlin region
GDP (GDP/employee in 1,000 €)	74,8	54,1	60,9	65,0	67,8	48,6
Productivity (gross value added in 1,000 €/employee)	69,6	50,3	56,6	60,4	63,0	45,2
Development of productivity (changes in gross value added between 1995 - 2003 in %)	29.5	8.2	20.8	24.8	18.6	4.4
Gross value added in tertiary sector (gross value added per 1,000 employees in the service sector in €)	71,4	48,0	57,0	56,9	63,2	45,3
Tax receipts (in €per inhabitant)	762	470	575	666	657	375
Level of employment (proportion, in %, of inhabitants aged 15-65 subject to social insurance contributions)	61.6	52.5	58.9	58.8	51.3	42.5
Rate of unemployment in %	6.3	11.0	9.8	6.2	9.7	19.1

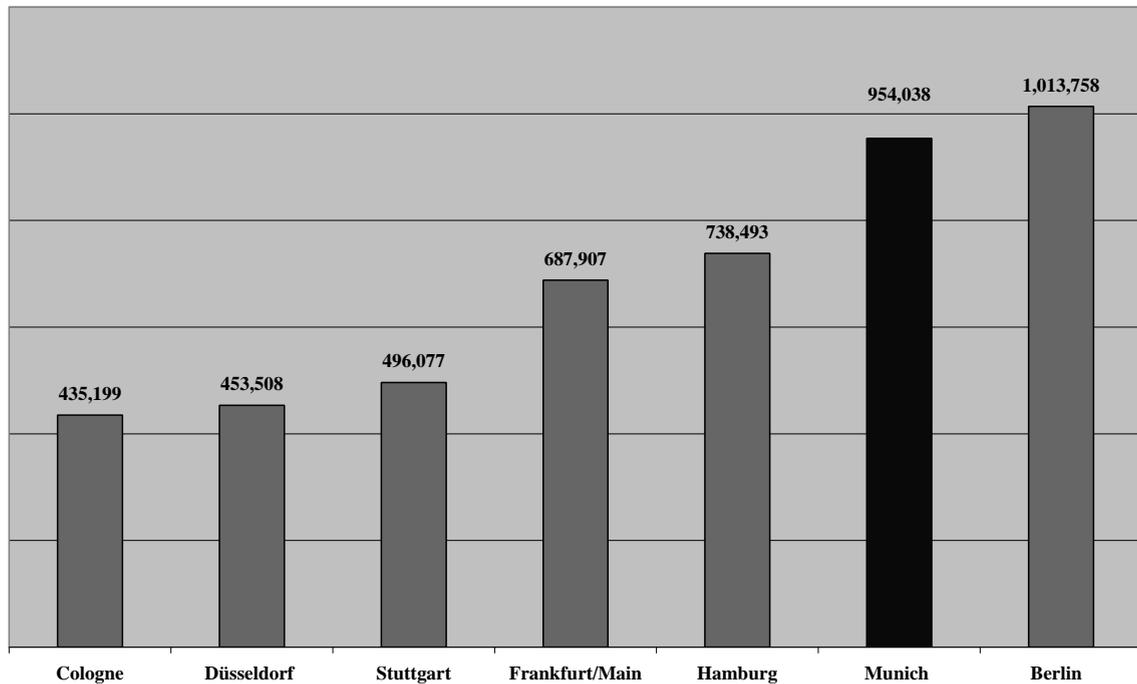
Source: PV, 2006

Figure 4.1: Purchasing power per capita in € in 2004: City of Munich and Bavaria in comparison with other cities in Germany



Source: LH München 2006b

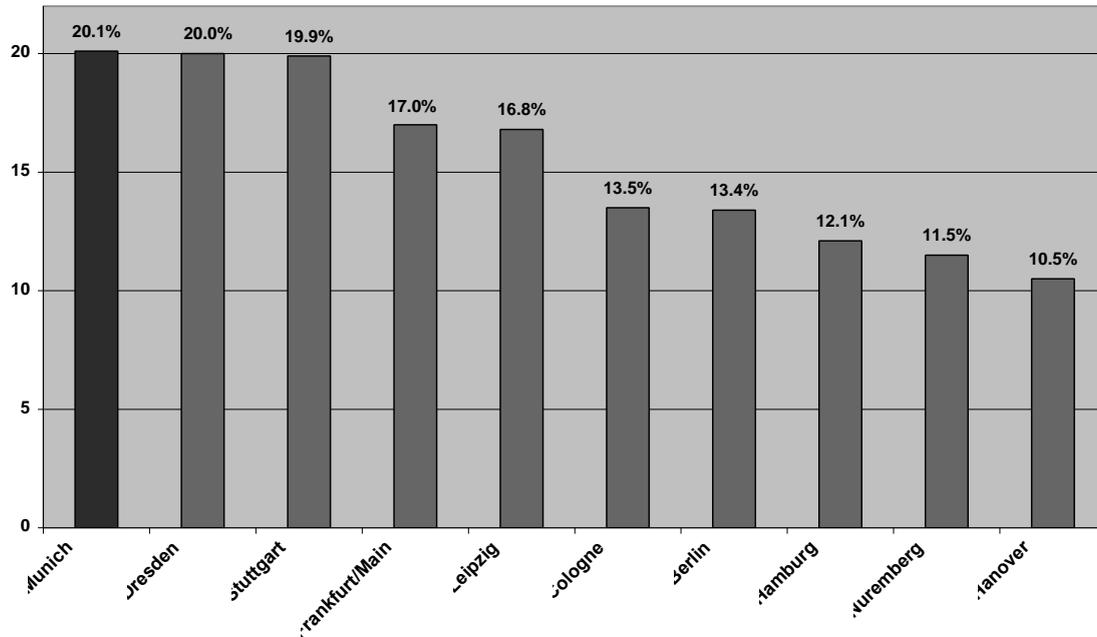
Figure 4.2: Employees (subject to social insurance contributions) in major German cities in 2005 (absolute figures; in each case agency districts at 30. 06. 2005)



Source: LH München 2005a

In addition to the Bavarian capital Munich, the Munich agency district includes the directly adjacent administrative districts of Dachau, Ebersberg, Fürstenfeldbruck, Munich and Starnberg.

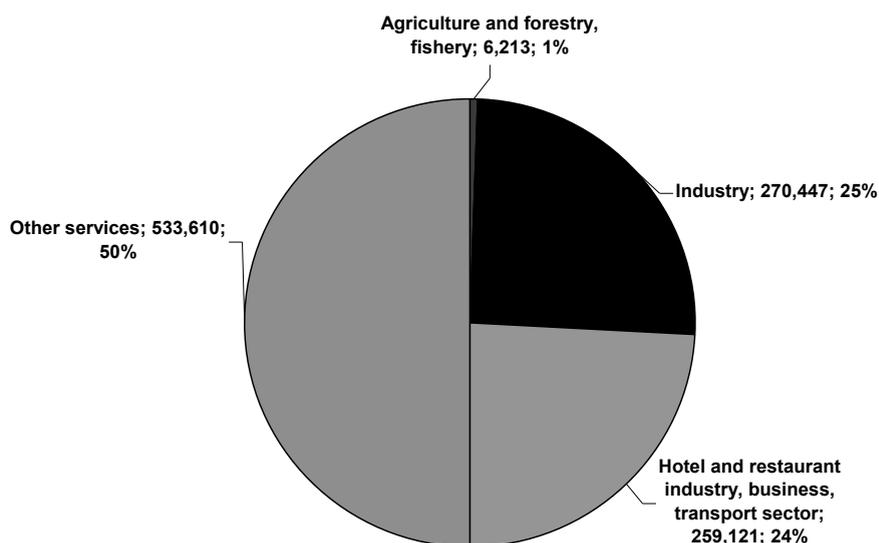
Figure 4.3: Quota of highly-qualified employees in German urban regions in 2005 in percent (quota of employees subject to social insurance contributions with a university degree or diploma from a higher education institution)



Source: INSM, 2006

If one looks at the employees differentiated according to economic sectors, the high level of tertiarisation in the Munich region is reflected here (see figure 4.4); it is even more marked in the City of Munich, with 76.3 percent of employees in the service sector. In a comparison of cities, this high figure is an indication of the Munich qualification structure, since in Munich an over-proportionate number of employees are to be found in services to business, such as consultancy and planning, which were able to create the most new jobs in the last years. Nevertheless, the manufacturing area continues to be of great importance, with almost a quarter of jobs in Munich (LH München, 2005a).

Figure 4.4: Employees (subject to social insurance contributions) in the region of Munich by economic sector in 2004 (absolute in thousands, in percent)



Source: PV, 2006, own design

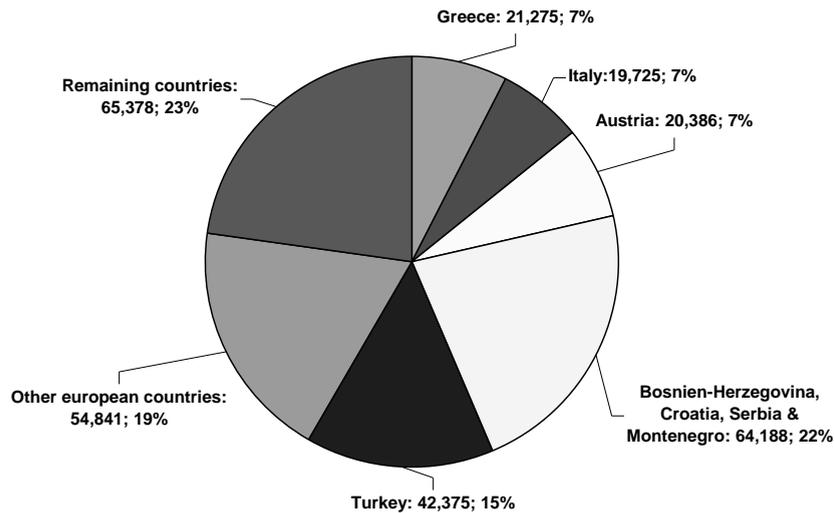
As a prospering economic location, the Munich region records a positive population development. The population in the region has grown continually since 1999 (see table 4.2). The proportion of foreigners has fluctuated in the last five years between 16.4 percent and 17.4 percent. In the City of Munich, the proportion of foreigners is higher, amounting to 24 percent. Especially people from the former Yugoslavia and Turkey are living in the city of Munich (see figure 4.5).

Table 4.2: Population development in the Munich region

Year	Population as at 31.12. of that year			Change compared with previous year		
	Total	Of which female, in %	Of which foreigners, in %	Total	Of which female	Of which foreigners
1999	2,410,083	51.4	16.4	22,698	10,865	6,917
2000	2,446,014	51.3	16.6	35,931	15,460	10,747
2001	2,483,013	51.2	17.0	36,999	16,237	15,422
2002	2,501,593	51.1	17.0	18,580	9,023	3,691
2003	2,521,332	51.2	17.2	19,739	10,543	6,911
2004	2,531,706	51.2	17.0	10,374	5,543	- 3,550

Source: PV, 2006

Figure 4.5: Ethnic structure of foreigners in Munich in 2005



Source: Bayerisches Landesamt für Statistik und Datenverarbeitung, 2006b

If one looks at the natural movement of population, in 2000 there was even an excess of births over deaths. In 2004, the excess of births over deaths was 3,468 (PV, 2006). In the case of population movement too, numbers moving in predominated, so that compared with other German urban regions, Munich has the highest rate of people moving in. However, the fluctuation (with the highest rate of people moving out) is also greatest here (see table 4.3). Finally, the Munich region is also predicted to have the highest relative population growth by 2020 (see table 4.4) (PV, 2006).

Table 4.3: In- and out-migration of the Munich region, and population forecast, in 2003

	Munich	Hanover	Nuremberg	Stuttgart	Hamburg	Berlin
Incoming rate (people moving in, in 1,000s)	66.8	34.4	53.8	44.7	45.2	37.9
Outgoing rate (people moving out, in 1,000s)	60.1	31.9	30.3	42.5	40.0	35.9
Population forecast 2020, in 1,000s	2,730.6	1,396.3	1,300.8	2,763.7	3,432.9	5,179.2

Source: PV, 2006

4.1.1.2 Intraregional differentiation

If one looks at the intraregional population development, what we see is an over-proportionate growth of the population in the surrounding areas (growth rates of over 10 percent between 1994 and 2004 in contrast to growth of less than 0.5 percent in the city over the same period). In particular, the administrative districts of Erding and Freising show growth rates of 15 to almost 20 percent (PV, 2006). The rapid growth of the surrounding areas is an indication that

the suburbanisation of the population continues, and that incoming population from outside the region is concentrated on the surrounding areas.

If one looks at the development of employment in the city of Munich as compared with the whole of planning region 14, one sees that with Munich's share of the population standing at around 50 percent of region 14, around two thirds of all employees (subject to social insurance contributions) (63 percent) come under the city area (see table 4.4). Since levels of employees in the surrounding area in 2005 rose somewhat more strongly, by 0.45 percent, than in Munich, the proportion of employees in the surrounding areas has now grown to 38 percent (LH München, 2005a). Of the total of 139,129 foreign employees in planning region 14, 69 percent work in the city of Munich (see table 4.4).

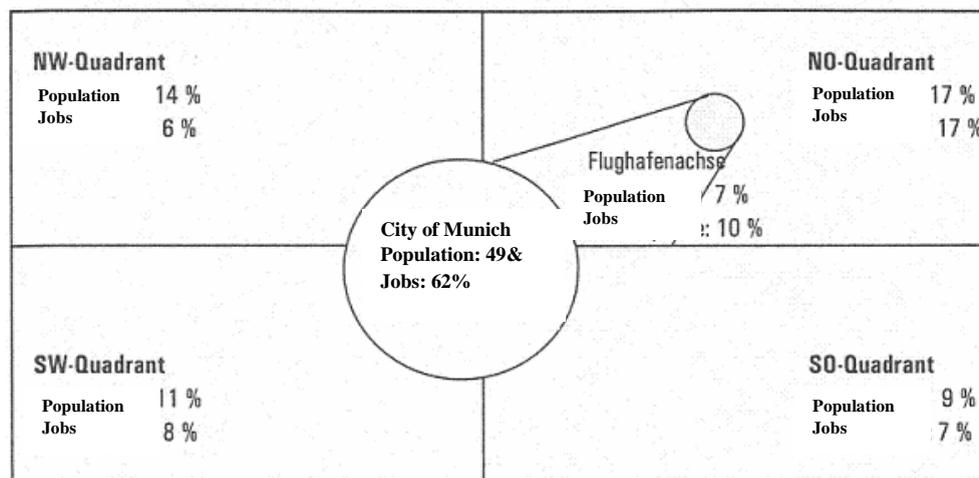
Table 4.4: Employees subject to social insurance contributions, by workplace, in region 14 (31.12. 2004)

Employees	Region 14 (total)	Of								
		City of Munich	which administrative districts							
			Dachau	Ebersberg	Erding	Freising	Fürstentfeldbruck	Landsberg am Lech	Munich	Starnberg
Salaried employees	759,558	492,281	16,097	18,272	13,524	40,262	22,806	13,874	118,960	23,482
Workers	311,758	175,690	11,588	11,093	11,872	25,763	13,695	11,987	38,825	11,245
Total employees	1,071,316	667,971	27,685	29,365	25,396	66,025	36,501	25,861	157,785	34,727
Of which female	492,918	315,019	13,492	13,142	11,998	28,643	17,813	12,014	64,237	16,560
Of which male	578,398	352,952	14,193	16,223	13,398	37,382	18,688	13,847	93,548	18,167
Of which foreign employees (total)	139,129	96,369	3,191	2,830	1,804	8,332	3,577	1,396	18,096	3,534

Source: Bayerisches Landesamt für Statistik und Datenverarbeitung, 2006a

On more detailed inspection of the Munich region, it is apparent that not only does the city of Munich have relatively more jobs than inhabitants, but that employment is concentrated to the north-east of Munich, on the so-called airport axis. The airport axis is described as the economic development corridor between the city and Munich airport in Hallberg Moos, and is characterised by a high level of knowledge-intensive and creativity-oriented enterprises from the IT sector and the media sector. Only 7 percent of the region's population lives in the airport axis, whereas 10 percent of jobs are located there. The administrative districts of Freising, Erding and Munich, which are also situated in the north east, have 17 percent of the jobs and 17 percent of the population, thus also presenting a ratio of population to jobs that is rather untypical for the suburban area (PV, 2006) (see figure 4.6).

Figure 4.6: Distribution of population and jobs in the Munich region (subject to social insurance contributions) in 2004



Source: PV, 2006

Examination according to economic sectors shows that ‘other services’ continue to be strongly concentrated in the city of Munich. Although the areas surrounding Munich showed particularly high growth rates between 1995 and 1998 in the case of jobs in the areas of banking/insurance (153 percent), private services (94 percent) and commerce (64 percent), Munich nevertheless retains its supremacy in these sectors (Kagermeier et al., 2001). In the field of services, the banking and insurance sectors above all (80 percent of the jobs subject to social insurance contributions in region 14) as well as public and private services (not including public administration) (76 percent) are concentrated in Munich (Bayerisches Landesamt für Statistik und Datenverarbeitung, 2006a).

To sum up, it can be said that suburban growth and the integration of the city and its surrounding area is advancing in Munich. The region has long been an indispensable prerequisite for Munich’s economic growth and its high standard of living. The rise of 11.4 percent in employees subject to social insurance contributions between 1996 and 2001 was split between the surrounding areas and the city by over 17 percent and just under 9 percent respectively. Without the relocations to the surrounding areas, growth in the urban region would hardly have been possible (Krau, 2003). Munich’s economic growth is a complex interplay of city and region: the product is the region, the brand is the city! For it is precisely in the outward presentation of enterprises from the suburban area that the specific qualities of the city are advertised. Thus the expansion of the Munich metropolis to an urban region appears irreversible (Krau, 2003).

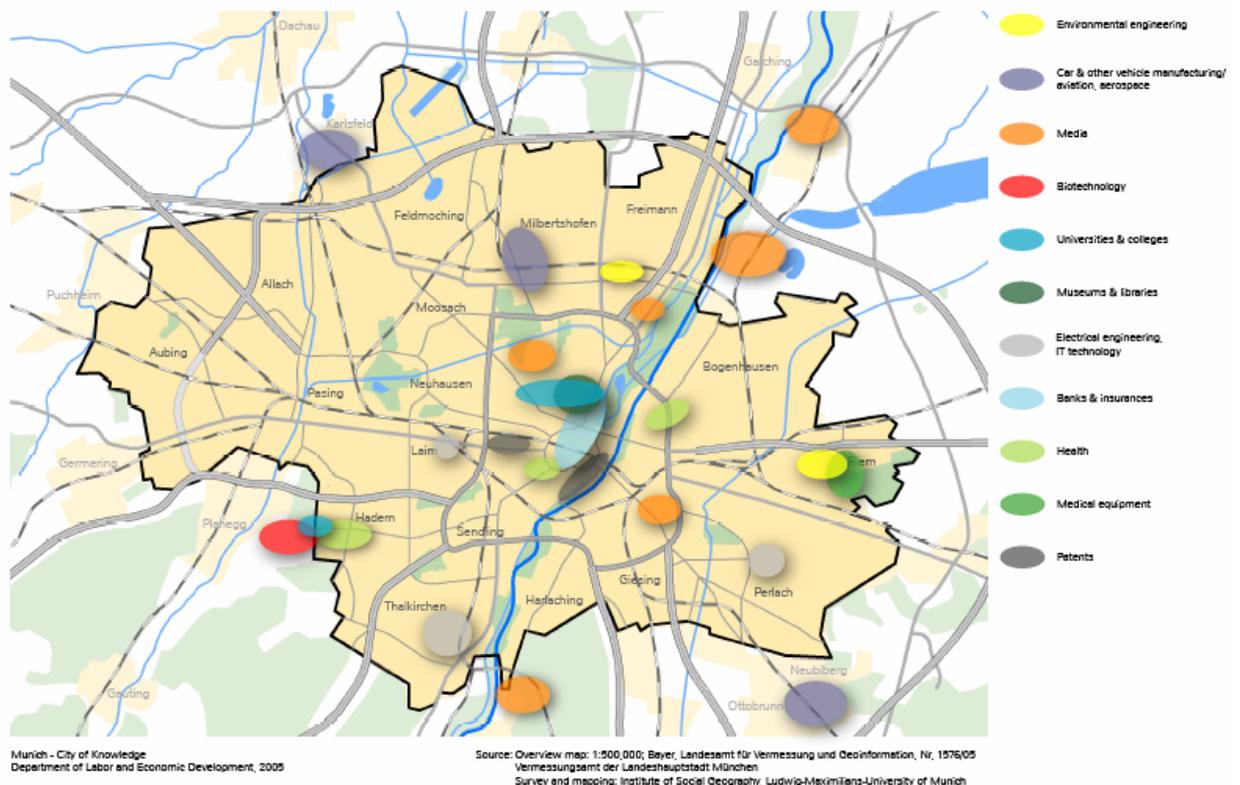
4.1.2 Munich’s Clusters as innovative growth poles of the city-region

The extraordinary competitiveness of the Munich region is attributable not only to the Munich Mix, i.e. to a diversified economic structure made up of global players and SMEs (see chapter 3.3), but also to the existence of numerous sector clusters (Prognos, 2006). They represent the

innovative growth poles of the city region. A cluster is defined as an alliance of companies, research and educational institutions, whose high potential for development is based on their diverse interconnections, which are above all based on trust. Sector clusters are characterised by the connection of enterprises that are active at different stages of the value-added chain for a product or product group. Besides this vertical dimension, a horizontal dimension is also discernible, for example in the case of co-operation between several enterprises. If these activities are spatially concentrated, we talk of regional clusters. Rehfeld (1999) describes regional production clusters as a locally condensed interactive connection of enterprises and protagonists in a particular wealth creation network (Rehfeld, 1999).

Munich's clusters are to be classified under the production-oriented, knowledge-intensive industries, the service sector, and the creative sector (see figure 4.7). Between the clusters there are numerous interfaces and areas of co-operation. Thus for example information and communication technology can be regarded as a cross-sectional technology, which is used in manufacturing industries such as the automobile industry, environmental technology, biotechnology, instrumentation and control technology, and also in the new media (Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology, 2006d)

Figure 4.7: Knowledge Clusters in Munich



Source: Hafner, Schier & von Streit, 2005

The following portraits describe some important knowledge-intensive clusters in Munich, and the specific conditions under which they arise and develop. They are:

- Biotechnology and the pharmaceutical industry
- Medical technology
- Environmental technology
- Aerospace and astronautics

The clusters for the creative sector, the ICT economy and finance, as well as the patents sector, are presented in chapter 5.

4.1.2.1 Biotechnology

The city of Munich and the surrounding region has developed into one of Germany's most successful biotechnology clusters over the last ten years and is a leader among the international biotechnology regions. A particular advantage of the Munich-based biotechnology firms is that the Bavarian capital, with its research institutions in the natural sciences and the life sciences, competent application centres in the health care sector and a multitude of medical equipment companies, has a high life science profile. Munich's life science sector provides almost 24,000 people with jobs, many of them in research (LH München, 2005c).

The dynamic energy which such an infrastructure can foster in research development is clearly evident in the example of the biotechnology. During the 1980's, Munich had excellent learning facilities in these fields, including the Max-Planck Institute for Biochemistry and Neurobiology (Biehler, 1999). Corresponding partners in industrial business were not located in Munich. It was first during the middle of the 1990's that these business sectors started setting up offices in the region.

Meanwhile, about 100 biotechnology firms, most of them small or medium-sized, and over 20 larger pharmaceutical companies (e.g. Bristol-Myers Squibb GmbH, GlaxoSmithKline GmbH & Co KG) are sited in and around Munich. Most of them concentrate on medical and pharmaceutical development and biotechnological application (red biotechnology), but are also active in green biotechnology (plants and food), bioinformatics and the manufacture of biotechnological implements and reagents. The small and medium-sized firms (SMEs) in the industry have over 2,200 employees, more than one in two of these working in the development of therapeutic and diagnostic drugs. In addition to those employed in the biotechnology SMEs, roughly another 8,000 people work in branches or subsidiaries of international or local pharmaceutical companies (Bio^M AG, 2005; LH München, 2005c).

Major factors in the success of the biotechnology companies in the area of Munich include: close co-operation with many well-known research and teaching institutions in the life sciences, such as Gene Centre Munich at the university of Munich (LMU) as well as innovation centres for biotechnology (IZB) or Max Planck institutes, the availability of capital from technology-oriented lenders, specialised service providers, extensive support and technology transfer, and a large pool of personnel with excellent training (LH München, 2005c, Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology, 2006d).

4.1.2.2 Medical Technology

With annual growth rates of five to six percent in Germany, the medical technology industry is a prime mover of economic development with favourable job prospects.

Over 200 producers of medical technology are concentrated in the area of Munich, and they employ about 14,000 people. Thus about one in three employees in this industry in Bavaria works in the Munich area (München, 2004b).

The product range of strongly technology-oriented Munich-based firms comprises laboratory equipment and services relating to medical technology, software for medical applications and a variety of highly specialised products for surgery, ophthalmology and dental medicine. Going by the number of firms, producers of diagnostic, therapeutic and orthopaedic products in particular are concentrated in Munich. Many of these firms are among the global market leaders in their respective narrow market segment. The city and district of Munich were among the territories with the largest number of new medical technology companies formed in the period from 1995 to 2002. The background to this development is the favourable location factors that Munich can offer: a strong base of university and other research institutions which turn out highly qualified graduates. In addition, the scientific research institutes are often the basis for spin-offs. On the other hand, the large number of hospitals and resident doctors in Munich generates extensive potential demand. Another factor is that industries which are of special importance to innovation in medical technology, such as biotechnology, nanotechnology and computer technology, are strongly represented in the urban region. Also important for the medical technology industry is the local presence of independent certification agencies, such as TÜV, which issues the CE label – a statutory requirement for any medical technology item (LH München, 2004b; BMBF, 2005).

4.1.2.3 Environmental Technology

The environment sector has experienced a dramatic technical development since the 1980s, making environmental technology an important growth sector today. Numerous firms in this shared-service industry have their centres in or around Munich. The positive dynamic development in environmental management in Munich is illustrated by the fact that the number of jobs in this industry increased by almost 30 percent in the years from 1994 to 2003. If the jobs created in the craft and trades sector and in the municipal waste disposal and waste water treatment facilities in the city and region of Munich are included, there were almost 9,000 jobs in environmental technology in 2003 (LH München, 2005d).

Going by turnover, the most important environment technology segment in Munich is waste management and recycling, followed by rehabilitation of contaminated sites and renewable energies. Instrumentation and control systems suppliers are important providers of environmental technology that are firmly based in the Munich area, and many environmental consultants also have their offices here. Most local firms in environmental management are small or medium-sized, with activities not only in environmental technology but also in other fields. Munich's environmental industry is also engaged in renewable energies, most of all photovoltaics, geothermal systems and biomass utilisation, which are considered to be the most innovative segments of the environment industry. Munich is not only home to a number

of producers, e.g., of solar cells, it is also the centre of development and research in this field. The research and development centre set up by General Electric (GE) in Garching in 2004 employs about 150 people and also undertakes research and development in the production of renewable energies (LH München, 2005d).

The Munich area is the base from which many university and non-university research institutions carry out important environmental activities, e.g., the GSF - National Research Center for Environment and Health. These institutes carry out research in the fields of energy, waste and water management, plant construction, combustion and fuel cell technology. Moreover, environmental societies and agencies, e.g. the German section of the International Solar Energy Society (DGS), have their principal offices in or near Munich. The internationally most important environment exhibition – IFAT – takes place in Munich every three years (Bayern International GmbH, 2005; LH München, 2005d).

4.1.2.4 Aerospace cluster

With a turnover of 6,000 million Euros and 26,500 jobs in 2006, aerospace in Bavaria is the location in Germany, and indeed Europe, with the highest turnover and greatest intensity of employment. The Munich region is pivotal to the industry, with a variety of company sizes, countries of origin and activities. Around 23,000 engineers, technicians and specialist staff in aeronautics and astronautics are employed in the industry at the Bavarian location. Since 1990, the *Land* of Bavaria has provided more than 180 million Euros for aeronautics and astronautics research (Ehrensberger, 2004; AOP, 2007). The 35 enterprises in the sector develop and produce amongst other things aeroplanes, launch rockets, satellites and the corresponding components and systems – including the international enterprises such as EADS, Eurocopter, MTU Aero Engines, but also medium-sized firms such as IABG, Liebherr Aerospace or Diehl, as well as the astronautics enterprises such as EADS-Astrium, MAN-Technologie and Kayser-Threde (Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology, 2006c and 2006d).

In 2003, the EU decided to relocate essential elements of the European satellite navigation system GALILEO to the Munich region, through which the region is gaining in European importance as a satellite navigation location. The operator consortium Galileo Industries has its base in Ottobrunn near Munich, and the Galileo control centre is being set up in Oberpfaffenhofen, at the site of the German Aerospace Centre (DLR). The DLR location in Oberpfaffenhofen consists of 8 institutes with more than 1,000 scientists and technicians (LH München, 2005e). At the same time, the satellite navigation cluster in Bavaria is included there, in which in the meantime so-called user forums have been formed for various branches: for ICT, safety engineering, robotics, transport, tourism and leisure, GIS and land utilisation as well as monitoring. Of the approximately 100,000 new jobs that are predicted in Europe in the sectors associated with GALILEO, around 10,000 are expected to be in Bavaria (Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology, 2006c).

Industrial aeronautics and astronautics receives support from a broad-based research infrastructure comprising, amongst others, the institutes for aerospace and astronautics at Munich Technical University (MTU), the 15 institutes of the faculties for aeronautics and astronautics of the armed forces' (*Bundeswehr*) university, the Fraunhofer Institute for

Communication Systems (ESK) or the Max Planck Institute for Extraterrestrial Physics (MPE) (LH München, 2005e).

The aerospace cluster is a striking example of how, through a continuous technology policy which started in the 1950s with Franz-Josef Strauss, the then defence minister and later minister-president of Bavaria, and is continued today through the cluster policy, it is possible to initiate a territorially integrated growth dynamic, i.e. one related to the Munich location.

4.1.2.5 What makes the clusters in Munich so successful?

What makes Munich so successful? The answer to this question refers to the concentration of research-intensive industrial branches. The representation of different sub-sectors of the knowledge-intensive economy demonstrates that Munich is a prominent locational centre of research-intensive branches involved in industrial activity, and that the city's economic base is by no means restricted to services. By comparing different development paths of European metropolitan regions, Stefan Krätke assigns the Munich regions to a path type that is characterised by a combined growth of knowledge-intensive industries and services (Krätke, 2007). Two prominent service sectors, financing and the patent system, will be discussed in chapter 5.

Biotechnology, medical technology, environmental technology and aerospace are characteristic constituents of the present-day knowledge-based economy. They are characterised by comparatively high expenditure on research and development, are based on knowledge that is relatively new, and they have the image of being technologies of the future (for example in the presentation of long-term innovation cycles) (Ossenbrügge, 2001).

Factors for successful cluster development include: Links between pure research/universities and enterprises: Institutions devoted to pure research, such as for example Gene Center Munich (Genzentrum München), the Max Planck Institutes, the German Aerospace Center in Oberpfaffenhofen and the GSF National Research Center for Environment and Health in Neuherberg, serve as the starting point for innovation processes. Via forms of technology transfer and spin-offs, the results obtained by the research institutions can be converted into entrepreneurial activities. The universities provide the necessary new generation of highly-qualified scientists, and also act as co-operation partners for start-up firms (see chapter 5).

Network of SMEs and large enterprises: Besides the research-intensive and often still young SMEs, the clusters are also characterised by large enterprises which, as a rule, have broad lines of business outside the respective technologies too. Examples of these firms are the highly traditional company Rodenstock in downtown Munich, or Bristol-Myers Squibb and GlaxoSmithKline.

Commercialisation protagonists: The clusters also have various commercialisation protagonists, who take on important tasks in financing, securing the legal basis, and market research. As an example, Bio^M AG is a financing, service and consulting company whose aim is to promote the development of the BioTech-Region Munich as an internationally renowned centre of excellence in the field of innovative biotechnology.

Competitions: Winning competitions is also significant for successful cluster development. Thus in the BioRegio competition run by the German Federal Ministry for Education, Research and Technology, Munich has been designated a model region. This

competition can be viewed as a significant step within the German biotechnology offensive, for leading the already well-developed knowledge base towards commercialisation successes. Environmental technology too can congratulate itself on having won out in competition: In 2005, German Environment Aid (*Deutsche Umwelthilfe*) named Munich winner of the 'German energy-saving capital' competition among cities and towns.

Links between the state and private organisations/enterprises: The enterprises of the future clusters are supported by the government of the state of Bavaria. Action in technology policy that took the long-term view ensured the building up of a complex infrastructure of research institutions, universities and intermediary organisations (such as Bio^M AG), through to the implementation of a cluster policy that was launched in 2006. It seems – as Jürgen Ossenbrügge (2001) puts it – 'that the Bavarian government and the technology policy that bears its mark has practicable experience and success in revolutionary (technology) reformism' (See also chapter 6).

4.2 Concomitants of economic growth

The disadvantages and concomitants of economic growth in the Munich region are increasing poverty (chapter 4.2.1) and an extremely strained market in land and housing (chapter 4.2.2).

4.2.1 Poverty in prosperity: the dark side of economic prosperity

Although Munich, as the prospering economic metropolis, has the highest purchasing power in Germany, not all parts of the population can participate equally in affluence. Munich's dark side is one of 'poverty in the midst of prosperity'.

The city's report on poverty, from the year 2004, reveals that the rate of poverty rose in both absolute and relative terms from the middle of the 1980s to 2004. In 1986, 83,500 of its citizens were classified as being poor, in 1997 158,500 and in 2004 177,700. In the period between 1986 and 1997, the density level of poverty in the population, per 1,000 citizens, rose from 65 to 122. This statistic reached its peak in 1997, receded to 146.9 in 2000, and since then has started rising again (in 2002, it reached a level of 156.7 per 1,000 and in 2004 a level of 133 per 1,000 inhabitants; see chapter 3.3.3).

As a rule poverty does not arise through a person's own fault. Rather, poverty arises through disruptions to the course of a person's life, above all through unemployment, illness, separation, divorce or becoming homeless. But poverty is also increasingly arising through inadequate earnings, particularly in the case of families with children. If one looks at that section of those affected by poverty who receive welfare assistance, then in the case of 34 percent of welfare recipients who are capable of working, unemployment is the reason for receiving welfare assistance. 16 percent of all households in receipt of welfare assistance – but 28 percent of all households receiving welfare assistance that have children – need supplementary welfare assistance on account of inadequate earnings. Households with several children, and specifically single-parent households, are more greatly affected by poverty. Whereas overall, only 3.5 percent of Munich households rely on welfare assistance, the proportion amongst single-parent households is 24.3 percent. 76 percent of the approximately 10,700 children under 14 who receive welfare assistance live in these households. Foreigners too are particularly affected by poverty: Thus the welfare assistance density amongst

foreigners was considerably higher, at 64 per 1,000 inhabitants, than for Germans (29 per 1,000 inhabitants). The main cause of poverty for foreigners too is unemployment (Schmid-Urban, 2003).

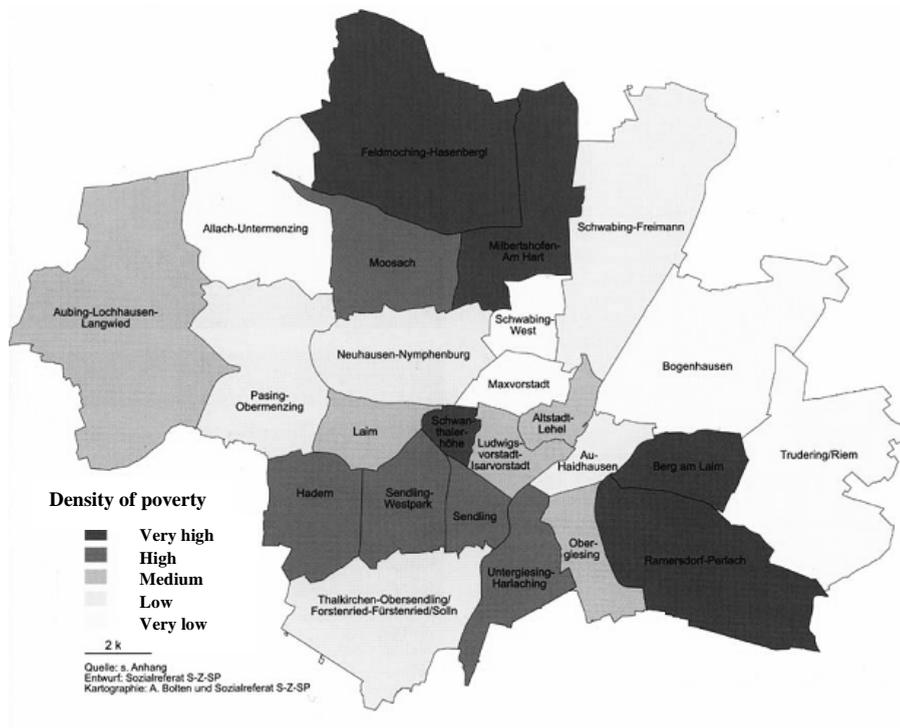
Overall, the problem groups in the Munich labour market are the long-term unemployed, mostly with low qualifications, migrants and young people without school-leaving certificates. There are hardly any jobs appropriate to their qualifications to be found in the capital of Bavaria any longer, since the jobs are aimed at higher-value services. They are unqualified even for simpler service activities, since often they have also lost employability along with the necessary social skills (Hafner, 2003).

The distribution of poverty in the city area is uneven. The historical development, location, function and building structure of the area are important influencing factors. As the map shows, five city districts indicate a very high need for socio-political action, i.e. poverty levels are particularly high here. These are the Schwanthaler Höhe district close to the city centre, Ramersdorf-Perlach and Berg am Laim in the east of Munich, as well as Milbertshofen-Am Hart and Feldmoching-Hasenbergl in the north of the city (see figure 4.10) (Schmid-Urban, 2003). A lot of foreigners are living in these city districts, too (see figure 4.11).

People living in these city districts are suffering more from low income, lack of educational capital, diseases of addiction, and a poor state of health than people in other city districts.

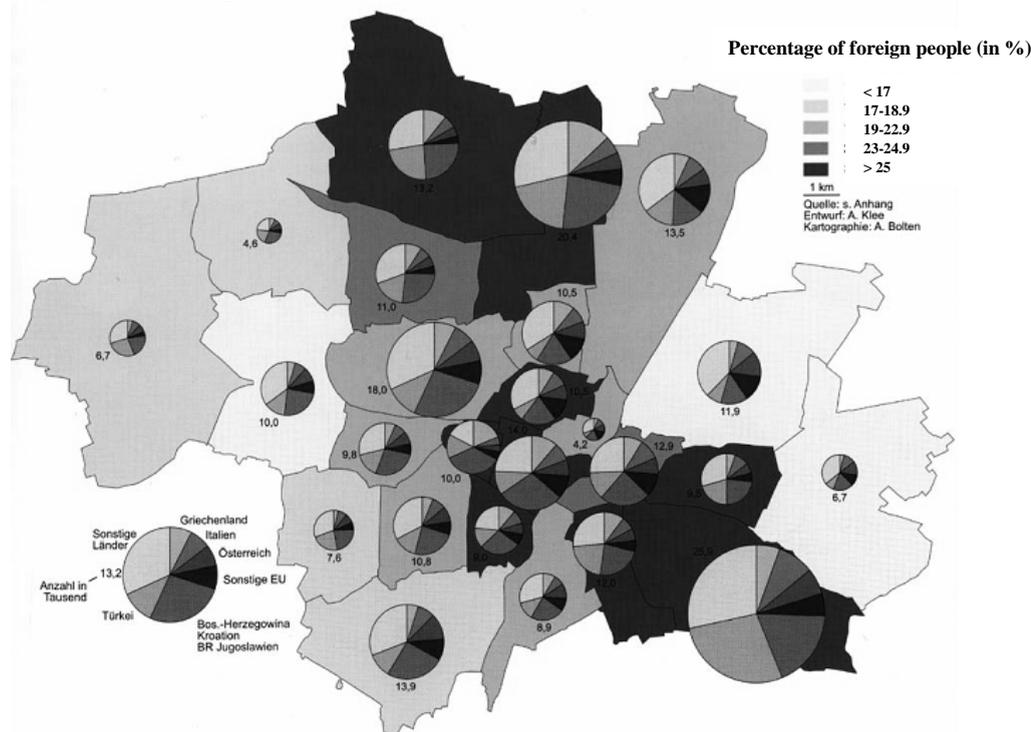
In the areas with a high poverty level, the share of foreigners is often higher than in the other city districts (see figure 4.11).

Figure 4.10: Density of poverty in Munich's city district



Source: Schmid-Urban, 2003

Figure 4.11: Foreign people in Munich city



Source: Schmid-Urban, 2003

These are also the city districts that are characterised by monotonous building structure, an unattractive living environment, little greenery, heavy traffic loads and a lack of infrastructure. ‘The double handicap of the poor’ is this: to be socially and economically disadvantaged, and at the same time to have to live in disadvantaged areas of the city which have been labelled ‘social focus points’. Living in disadvantaged residential areas also means dealing with diverse negative attributions and stigmatisation processes from the outside (Hafner, 2003).

4.2.2 Munich’s tight housing market

Also linked to the development of ‘Boomtown Munich’, which in recent years has been a sought-after location for companies to establish themselves and for start-ups, and also had to cope with an enormous influx of residents (see chapter 4.1.1), are the land prices. Compared with other large German cities, Munich’s land prices are particularly high. Thus a comparison of prices in the ten largest German cities for the year 2001 for residential land showed that Munich is clearly the most expensive, at an average of 860 Euros per square metre, whereas a square metre of construction land costs less than 300 Euros for example in Bremen, Dortmund or Hamburg (Metzler & Zademach, 2003). Large price differences for land also exist between the various districts of Munich. In addition to the hard location factors such as soil condition or building rights, ‘soft’ location factors also play a central role for land prices. For example, the high land price levels in the southern districts of the city (Solln, Harlaching) can be attributed to the general attractive location of these better-class residential areas (Metzler & Zademach, 2003).

The high land prices also affect rents. Compared with the 20 largest German cities, record levels of rent are reached in Munich. For initial rental of a well-equipped flat of around 70 square metres in a good location, prices for rent exclusive of heating varied between 10.20 and 14.30 Euros per square metre in January 2001. In basic and average areas of Munich, rents are paid that would apply for accommodation in the best locations in other German cities (Popp & Wiegandt, 2003).

The high rents are an indicator of scarcity. In particular, Munich lacks accommodation for rent that falls into the lower and middle price range. The interplay of supply and demand does not fit in Munich for rented accommodation. This mismatch is surprising at first sight, since from 1970 to 2001 the population rose by only about 100,000, whereas the number of homes increased by around 240,000. However, the number of households rose markedly in this period: a growth of 28 percent was recorded from 1970 to 2003. One cause of this is the trend towards the ‘singles’ society. The second significant cause is the growing demand for space in urban society. The living area per inhabitant has risen in the last few decades from 24 to around 38 square metres. Since 1999, the region has once again undergone high population growth. In terms of figures alone, the rise in population by 36,000 in the years 1999 and 2000 alone entailed an increased demand for around 20,000 homes. Amongst the winners in the boom and amongst highly qualified employees in the growth sectors in the city region with high incomes, there is a willingness to pay high rents. However, in particular families with just one income cannot pay this level of rent in the city. The migration of families to the (cheaper) surrounding areas is the consequence. Like other large German cities, for many years Munich has recorded negative balances of migration with its immediate surrounding areas, of a magnitude of around 6,000 people (with main residence) a year (see table 4.5) (IMU, 2002).

Table 4.5: Balance of people moving into or out of Munich (inhabitants with main residence) 1996-2000

Balance with...	1996	1998	2000	Average p.a. 1995-2000
Munich region	-6,435	-6,965	-5,968	-6,428
Rest of Upper Bavaria	-1,638	-1,071	-808	-1,236
Rest of Bavaria	+1,313	+1,800	+1,901	+1,414
Remaining Federal Länder	+8,512	+10,438	+10,671	+9,597
Germany overall	+1,752	+4,202	+5,796	+3,347
Abroad	+6,171	+11,152	+11,336	+5,855

Source: IMU, 2002

People affected by poverty, and the low-waged, also have no opportunity to meet their needs adequately on the open housing market in Munich. They are reliant on what is on offer in the state-supported housing market. The most important segment here is the construction of state-subsidised housing. In 2005, around 11 percent of the stock on the Munich housing market was reserved housing that was awarded to those entitled to state-subsidised housing (52,000 state-supported homes). Compared with other large German cities, Munich is placed with Cologne and Berlin in the mid-range after Hamburg (2004: 16 percent) and ahead of Stuttgart (2004: 7 percent) (LH München, 2006d). But in the construction of state-subsidised housing too, supply and demand are increasingly diverging: the stock of publicly-supported homes is becoming ever smaller due to the declining levels of reserved housing. New

construction can only partially compensate for the ‘melting away’ of housing stock. At the same time, the number of people who have a claim to publicly-supported housing, e.g. through rising unemployment, is increasing. Thus the gulf between the available supply of housing and the demand for state-subsidised housing is increasingly widening. The state-subsidised housing available to Munich, as the capital of Bavaria, then has to be reserved, by means of extremely restrictive access conditions such as low income limits, for those sections of the population who do not stand a chance on the open market. These are the long-term unemployed, those receiving welfare assistance, and migrants. A dilemma for housing policy becomes apparent here: the lower the stock of state-subsidised housing and the narrower the circle of those entitled to access, the greater the likelihood that a ‘culture of poverty’ will arise in the social housing estates. Thus since the 1980s, the construction of state-subsidised housing, which in the 1950s and 1960s was designed for broad sections of the population, has become an instrument for supplying housing to needy population groups. Once state-subsidised housing construction becomes concentrated in a district, processes of stigmatisation and discrimination often follow (Hafner, 2003).

The aim of urban housing policy must therefore be to provide adequate living space for people who are disadvantaged on the housing market and for those on middle incomes. In 1994 the municipal programme known as the ‘Munich Model’ came into being, which enables those on middle incomes who are looking for housing to find cheaper housing (both owned and rented) in the city. With this model, the intention is above all to keep families with children in the city. Also in 1994, the city council launched ‘socially just land use’ (*Soziale Bodennutzung*), in order to ensure the promotion of good-value housing and state-subsidised housing (LH München, 2006g). The ‘socially just land use’-model means that private property owners share in the consequential costs of infrastructure that the city has to provide as a result of the granting of new construction rights (e.g. kindergartens, open spaces and green spaces), and in the financing of state-subsidised housing (Metzler & Zademach, 2003).

However, these measures seem like a ‘drop in the ocean’ in terms of alleviation of the strained housing market. The postcard caption ‘Munich – if you treat yourself to nothing else’ is an allusion to the high rents and cost of living in the city region, which can be seen as a central bottleneck factor for the further positive development of Munich (see chapter 6).

On the whole, Munich’s current situation in economic terms can be characterised as very positive. Munich has developed into one of the most dynamic and prosperous urban agglomerations in Europe. This development is reflected in the dynamic labour market, the high level of tertiarisation, the high purchasing power as well as the positive demographic development. Concerning the intraregional differentiation it is important to note that the suburbanisation of the population is still an issue and, marking a more recent trend, also knowledge-intensive enterprises as well as headquarters locate in suburbia – especially in the north-east of Munich, on the so called airport axis.

Part of Munich’s economic success can be attributed to the existence of numerous clusters like biotechnology and pharmaceutical industry, medical technology, environmental technology, ICT, aerospace, the Media and finances. They form the innovative growth poles of the city region. The clusters are not only made up by links among enterprises of the respective branches but also by links to the numerous research institutions in the Munich area, by the networks of SMEs and large enterprises as well as links to commercialisation protagonists. ‘The current economic success of Munich is accompanied by ‘poverty in the

midst of prosperity' – especially families with children, unemployed persons as well as foreigners are particularly affected by poverty.

Munich's economic success has also led to booming land and housing prices and rents which poses severe problem especially for families with only one income as well as other less affluent households. This is one reason why Munich still has negative balances of migration with its region. Another problem is the cutback of state-subsidised housing which leads to extremely restrictive access conditions and consequently to a concentration of disadvantaged groups in certain areas of the city.

5 THE STATE OF THE CREATIVE KNOWLEDGE SECTORS

In this chapter the creative knowledge sectors of Munich's urban economy will be analysed, firstly in a general way by comparing national and regional data on the creative knowledge sectors and their development over the last 10 years. Secondly, the branches of the creative knowledge sectors will be discussed separately with special reference to the concept of path dependency and the concept of clusters. The concept of path dependency as well as the cluster concept will be employed because the perspective of a 'knowledge-based' regional development path is being emphasised as a major theme in urban and regional research with respect to the thesis that within an increasingly innovation-driven economy, the development opportunities of urban regions today are particularly formed by their potentials and capacities in the field of knowledge-intensive economic activities (Krätke, 2007; Matthiesen, 2004; Kujath, 2005).

5.1 Statistical analysis of the creative knowledge sectors

In the following statistical analysis, data on the development of the creative knowledge sectors of the Munich city region will be compared with the development of these sectors on the national as well as on the regional (Bavarian) scale.

As defined by the ACRE project team, the creative knowledge sectors consist of following sub-sectors:

1. The creative industries that are made up by advertising, architecture, the art and antiques market, crafts, design, designer fashion, film and video, interactive leisure software, music, the performing arts, publishing, software and computer services, television and radio (adapted from DCMS, 1998).
2. Information & communication technology (ICT) (adapted from OECD definition)
3. Finance
4. Law and other business services
5. R&D and higher education

(See annex 1 for a list of the selected NACE codes for each sector; it was decided to use the NACE codes and not the ISCO codes as the Länder (states) are the lowest spatial level on which the codes are available)

5.1.1 *Employees in the creative knowledge sector*

In 2004, the proportion employees subject to social insurance contributions working in the creative knowledge sector as defined above accounted for about 21.5 percent of all employees in Germany. In Bavaria the proportion rises to 22.6 percent, and in the region of Munich (planning region 14) over 33 percent of all employees work in this sector. This figure is only topped by the city of Munich, where over 37 percent of all employees work in the creative knowledge sectors. Around 9 percent of all employees in Germany work in the creative industries, whilst in the region and city of Munich 13 percent of all employees work in the

creative industries (see table 5.1). The second biggest category within the creative knowledge sector is that of finance, with 7 percent in the region and 9 percent in the city of Munich. 8.5 percent of all employees in the city work in the sub-sector of law and other business services (6.8 percent in the region) and around two percent in R&D (2.5 percent in the region).

Table 5.1: Employees in the creative knowledge sector subject to social insurance contributions, in absolute figures and in relation to all employees, in 2004

	Germany		Bavaria		Region of Munich (Planungsregion 14)		Munich city	
	Employees (abs.)	%	Employees (abs.)	%	Employees (abs.)	%	Employees (abs.)	%
All sectors	26,523,982	100	4,288,495	100	1,069,510	100	663,961	100
Creative knowledge sector (altogether)	571,4465	21.54	969,641	22.61	358,446	33.51	248,628	37.45
1. Creative Industries	2,336,429	8.81	389,783	9.09	135,748	12.69	85,977	12.95
Advertising	103,040	0.39	14,864	0.35	7,243	0.68	5,107	0.77
Architecture	322,319	1.22	48,872	1.14	19,028	1.78	11,611	1.75
Arts / antiques trade	854,930	3.22	144,845	3.38	31,796	2.97	20,871	3.14
Designer fashion	172,894	0.65	40,691	0.95	3,333	0.31	1,424	0.21
Video, film, music and photography	299,953	1.13	40,630	0.95	19,089	1.78	11,880	1.79
Music and visual and performing arts	115,614	0.44	13,895	0.32	5,170	0.48	4,653	0.70
Publishing	152,477	0.57	32,415	0.76	15,048	1.41	10,829	1.63
Computer games, software, electronic publishing	255,240	0.96	43,534	1.02	26,360	2.46	14,843	2.24
Radio and TV	59,962	0.23	10,037	0.23	8,681	0.81	4,759	0.72
2. Information Communication Technology	670,633	2.53	139,777	3.26	47,375	4.43	31,352	4.72
3. Finances	1,035,399	3.90	188,251	4.39	76,064	7.11	59,866	9.02
4. Law and other business services	1,294,242	4.88	204,311	4.76	72,551	6.78	56,529	8.51
5. R&D and higher education	377,762	1.42	47,519	1.11	26,708	2.50	14,904	2.24

Source: BAA 2006, own calculations

The decrease in employees subject to social insurance contributions in the creative knowledge sectors in Germany, Bavaria, the region and the city of Munich (see table 5.2) is concordant with the general decrease in employees subject to social insurance contributions in

all sectors in the various spatial areas. However, in the region and city of Munich the decrease in employees in the creative knowledge industries and especially in the creative industries has been bigger than in all sectors. Two factors may be responsible for this trend. Firstly, jobs have actually been reduced. This seems to be plausible, in relation to the heavy losses in the sub-sectors of the creative industries such as designer/fashion and publishing, as these sub-sectors still have many manufacturing jobs which are increasingly outsourced to cheaper locations (Schier, 2003; Biehler et al., 1994). Secondly, jobs subject to social insurance contributions have been converted into freelance jobs due to cost-cutting after the crisis in 2000. This seems to be plausible and in accordance with other studies (see section 2.5.1) in relation to jobs in advertising and in ICT. Considerable job gains have been made in the sub-sectors of radio and TV as well as in law and other business services despite of the “Krich-Krise” in 2002 (see table 5.2).

Table 5.2: Changes in the number of employees in the creative knowledge sector subject to social insurance contributions 2000-2004, in percent

	Germany	Bavaria	Region of Munich (Planungsregion 14)	Munich city
All Sectors	-4.68	-1.75	-0.14	-1.8
Creative knowledge sector (altogether)	-3.32	-2.68	-1.05	-2.06
1. Creative Industries	-7.73	-9.29	-5.86	-6.95
Advertising	-13.53	-12.27	-15.99	-19.61
Architecture	-8.86	-2.22	1.36	-3.20
Arts / antiques trade	-13.25	-11.52	-9.63	-10.88
Designer fashion	-27.81	-27.21	-30.59	-33.46
Video, film, music and photography	23.07	2.91	-5.19	-7.53
Music and visual and performing arts	-1.70	4.07	-3.54	-0.73
Publishing	-12.69	-14.88	-9.14	-9.10
Computer games, software, electronic publishing	7.01	3.53	0.77	-0.85
Radio and TV	0.07	-1.56	0.98	16.76
2. Information Communication Technology	-9.12	-8.03	-6.57	-7.49
3. Finances	-4.61	-1.31	-1.33	-3.68
4. Law and other business services	7.76	12.31	10.97	8.95
5. R&D and higher education	6.74	13.26	7.30	10.17

Source: BAA 2006, own calculations

5.1.2 Enterprises in the Creative Knowledge Industries

In 2004, the creative knowledge sector comprised almost 60,000 enterprises in the region of Munich. Almost 60 percent of these enterprises were located in the city of Munich (see table 5.3). The same figure applies for the enterprises of the cultural industries. They are also more concentrated in the city of Munich than in the adjacent administrative districts (*Landkreise*) (see chapter 2.1 for an explanation of the planning region). With regard to the

sub-sectors of the creative knowledge sector, about 2/3 of the enterprises belong to the cultural industries and about one quarter to law and other business services.

Table 5.3: Companies in the creative knowledge sector 2004 (absolute figures and in percent)

	Region of Munich		Munich city	
	companies	%	companies	%
Creative knowledge sector (altogether)	59,597	100 %	35,340	100%
1. Creative Industries	40,032	67.17	23,693	67.04
Advertising	2,739	4.60	1,757	4.97
Architecture	8,049	13.51	4,613	13.05
Arts / antiques trade	8,203	13.76	4,051	11.46
Designer fashion	648	1.09	370	1.05
Video, film, music and photography	9,945	16.69	6,064	17.16
Music and visual and performing arts	4,209	7.06	2,877	8.14
Publishing	2,938	4.93	2,070	5.86
Computer games, software, electronic publishing	3,179	5.33	1,815	5.14
Radio and TV	122	0.20	76	0.22
2. Information Communication Technology	3,313	5.56	1,530	4.33
3. Finances	931	1.56	436	1.23
4. Law and other business services	14,509	24.35	9,251	26.18
5. R&D and higher education	812	1.36	430	1.22

Source: BAA 2006, own calculations

Despite the crisis in 2001, the number of enterprises in the creative knowledge sector has developed very positively in the region of Munich (+23.4 percent) as well as in the city of Munich (+20.6 percent) in the years 1996 to 2004 (see table 5.4).

Table 5.4: Changes in the number of companies in the creative knowledge sector 1996 to 2004 (absolute figures and in percent)

	Region of Munich		Munich city	
	Absolute	Relative (in %)	Absolute	Relative (in %)
Creative knowledge sector (altogether)	11,301	23.40	6,046	20.64
1. Creative Industries	5,796	16.93	3,004	14.52
Advertising	373	15.77	233	15.29
Architecture	1,019	14.50	533	13.06
Arts / antiques trade	-1,184	-12.61	-993	-19.69
Designer fashion	-188	-22.49	-133	-26.44
Video, film, music and photography	1,924	23.99	1,007	19.91
Music and visual and performing arts	902	27.28	580	25.25
Publishing	538	22.42	385	22.85
Computer games, software, electronic publishing	2,359	287.68	1,364	302.44
Radio and TV	53	76.81	28	58.33
2. Information Communication Technology	363	12.31	122	8.66
3. Finances	1	0.11	-22	-4.80
4. Law and other business services	4,958	51.91	2,869	44.95
5. R&D and higher education	183	29.09	73	20.45

Source: BAA 2006, own calculations

The number of the enterprises in the creative industries has developed less positively (+16.9 percent in the region; +14.5 percent in the city), mainly due to the negative development in the sub-sectors of arts/antiques trade as well as designer fashion. However, the sub-sectors of computer games, software, electronic publishing as well as radio and TV show the most positive trend over the years 1996 to 2004.

If we look at the development of the number of enterprises for the years 2000 to 2004 the increase is lower than from the years 1996 to 2004 (see table 5.5). The sub-sector of ICT, which had boomed until 2000, was particularly hit by the crises of 2001.

Table 5.5: Changes in the number of companies in the creative knowledge sector 2000 to 2004 (in percent)

Changes between 2000-2004 in %	Region of Munich	Munich city
Creative knowledge sector (altogether)	9.00	8.38
1. Creative Industries	6.32	5.37
Advertising	4.34	5.97
Architecture	7.68	7.68
Arts / antiques trade	-5.20	-9.21
Designer fashion	-16.06	-16.67
Video, film, music and photography	11.55	10.01
Music and visual and performing arts	3.14	1.02
Publishing	7.27	6.37
Computer games, software, electronic publishing	39.43	44.62
Radio and TV	9.91	0.00
2. Information Communication Technology	-7.59	-9.25
3. Finances	-0.43	-1.13
4. Law and other business services	23.24	21.71
5. R&D and higher education	10.63	8.86

Source: BAA 2006, own calculations

5.1.3 Turnover in the creative knowledge sector

The total turnover of creative knowledge sector amounted to 9.5 billion Euros in the region of Munich 2004. More than 60 percent of this turnover was generated in the city of Munich (5.9 billion) (see table 5.6).

In the Munich region, the creative industries accounted for 34 percent of the total turnover for the creative knowledge sector. The ICT sub-sector had a share of 18 percent, and law and business services accounted for almost 44 percent in 2004 in the Munich region.

Table 5.6: Turnover of the creative knowledge sector in 2004 (absolute and in percent)

	Region of Munich		Munich city	
	Turnover (in 100€)	%	Turnover (in 100€)	%
Creative knowledge sector (altogether)	95,385,607	100	59,226,088	100
1. Creative Industries	32,605,516	34.18	17,519,940	29.58
Advertising	1,563,489	1.64	1,058,884	1.79
Architecture	2,547,489	2.67	1,557,766	2.63
Arts / antiques trade	6,493,448	6.81	3,728,618	6.30
Designer fashion	946,079	0.99	914,230	1.54
Video, film, music and photography	10,139,779	10.63	5,632,405	9.51
Music and visual and performing arts	631,837	0.66	344,782	0.58
Publishing	3,076,721	3.23	2,273,973	3.84
Computer games, software, electronic publishing	3,363,121	3.53	1,813,286	3.06
Radio and TV	3,843,553	4.03	195,996	0.33
2. Information Communication Technology	17,181,674	18.01	14,422,281	24.35
3. Finances	3,121,045	3.27	3,067,104	5.18
4. Law and other business services	41,882,920	43.91	23,813,546	40.21
5. R&D and higher education	594,452	0.62	403,217	0.68

Source: BAA 2006, own calculations

The positive development of the creative knowledge sector is also reflected in the rise in turnover (68 percent in the region; 40 percent in the city) in the years 1996 to 2004 (see table 5.7).

Table 5.7: Changes in the turnover in the creative knowledge sector, 1996 - 2004 (in percent)

	Changes 1996- 2004 (in %)	
	Region of Munich	Munich city
Creative knowledge sector (altogether)	67.97	40.07
1. Creative Industries	19.98	2.64
Advertising	-40.30	-20.39
Architecture	0.78	-8.26
Arts / antiques trade	-12.88	-26.48
Designer fashion	-3.51	19.69
Video, film, music and photography	30.80	21.68
Music and visual and performing arts	60.92	36.19
Publishing	-0.04	-6.20
Computer games, software, electronic publishing	188.58	112.31
Radio and TV	218.44	330.65
2. Information Communication Technology	200.35	251.04
3. Finances	73.46	83.06
4. Law and other business services	92.38	24.56
5. R&D and higher education	84.29	29.01

Source: BAA 2006, own calculations

The turnover of the creative knowledge sector developed more positively in the region of Munich than in the city of Munich, with increases of almost 68 percent and 40 percent respectively in the years 1996 to 2004. In respect of the sub-sectors, the turnover of the

creative industries developed less positively (20 percent in the region; 2.4 percent in the city) than the other sub-sectors such as ICT, Finance and Law and other business services. Only radio and TV as well as software and computer games showed very positive figures.

If we look at the development for the years 2000 to 2004, a very different picture appears. The enterprises in the region were able to increase their turnover by 8.7 percent, whereas the turnover of the enterprises located in the city of Munich decreased by 5 percent (see table 5.8). Only the sub-sector of Finance showed very positive development in this period.

Table 5.8: Changes in the turnover in the creative knowledge sector, 2000 - 2004 (in percent)

	Changes 2000- 2004 (in %)	
	Region of Munich	Munich city
Creative knowledge sector (together)	8.78	-5.07
1. Creative Industries	-12.34	-6.07
Advertising	-32.53	-35.91
Architecture	0.91	-4.81
Arts / antiques trade	-26.57	-10.11
Designer fashion	-14.95	4.57
Video, film, music and photography	-14.27	8.98
Music and visual and performing arts	-3.97	-18.60
Publishing	-16.37	-20.36
Computer games, software, electronic publishing	9.36	4.04
Radio and TV	21.69	29.53
2. Information Communication Technology	-1.26	4.09
3. Finances	220.83	321.66
4. Law and other business services	31.98	-17.28
5. R&D and higher education	54.71	10.24

Source: BAA 2006, own calculations

5.1.4 The Development of the Creative Industries 2000 to 2004: an overview

With regard to the development of the numbers of enterprises in the cultural industries, all sub-sectors experienced an increase in numbers, with the exception of the sub-sectors of arts and antiques trade and designer fashion. The figures for computer games, software and electronic publishing rose by almost 40 percent in the region, and even over 40 percent in the city of Munich. Also the number of enterprises in video, film, music and photography as well as TV and radio rose by about 10 percent. Looking at the development of the sub-sector of advertising alone (see figure 5.1, 5.2, 5.3) it becomes apparent, that in the year of 2004 more companies in this sector employed fewer people, and achieved a lower turnover, than in the year 2000. The same development can be seen for the sub-sector of publishing, and also to a lesser extent for video, film, music and photography, and for the computer sub-sector.

Figure 5.1: Changes in the number of companies in the cultural industries, 2000 – 2004 (in percent)

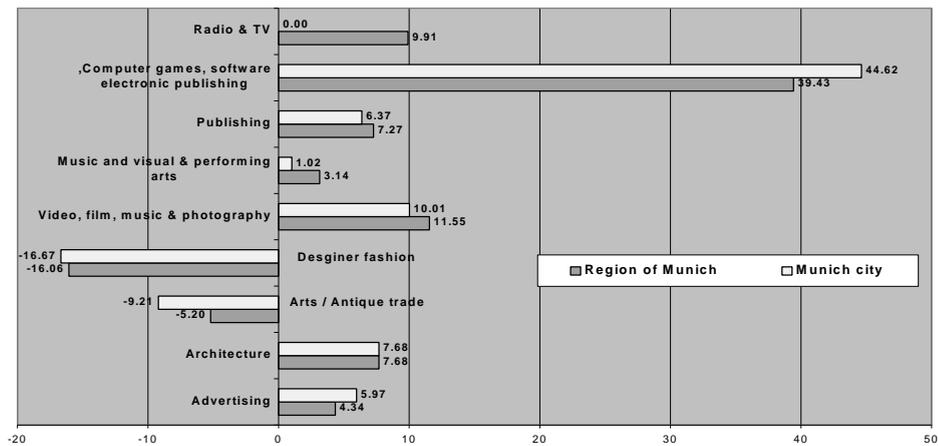


Figure 5.2: Changes in numbers of employees in the cultural industries paying national insurance contributions between 2000 and 2004 (in percent)

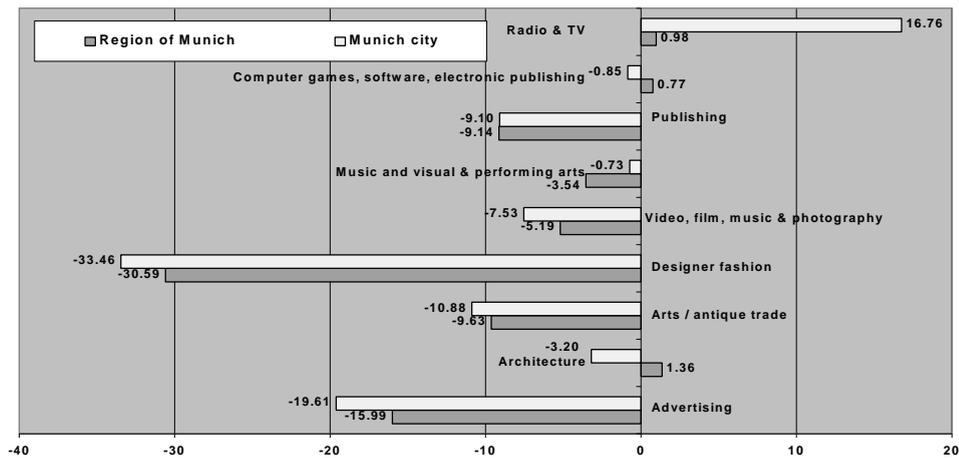
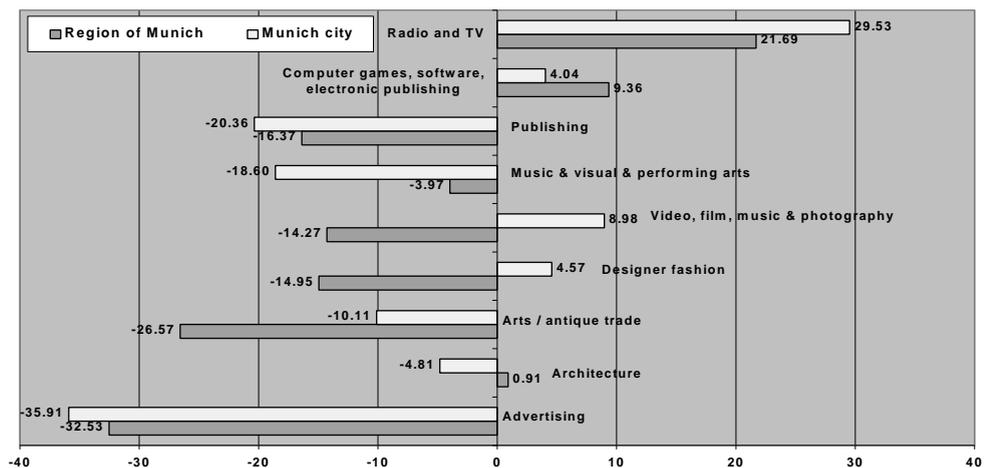


Figure 5.3: Changes in turnover in the creative industry between 2000 and 2004 (in percent)



Source Figure 5.1, 5.2, 5.3: BAA 2006, own calculations

5.1.5 Research and Development in the city region of Munich

Firstly, it must be stated that the number of employees working in R&D in the Munich region is very high. With a proportion of about 3.3 percent of employees in R&D (see table 5.9) Munich is only topped by the region of Stuttgart with 3.4 percent (Stifterverband Wissenschaftsstatistik, 2006). The same is true for the expenditure on R&D in relation to GDP. Only the enterprises of the region of Stuttgart invest more in R&D (5.2 percent) than the enterprises in the region of Munich which invested over 4 percent of the GDP.

Taking a closer look at the two tables (5.9, 5.10) it becomes apparent that the firms active in R&D are very much concentrated in the city of Munich. Whereas the proportion of the employees in the counties (*Landkreise*) is between 0.3 percent (Erding) and 2.4 percent (Dachau), only the administrative district of Starnberg – with 4.7 percent of all employees in R&D – has a higher proportion than the city of Munich with 4.4 percent. Although the number of people working in R&D has dropped by 4 percent in the city of Munich (by 5.6 percent in the region), enterprises in Munich invested 7 percent more in 2003 than in 1997 (expenditure in the region has remained stable).

Table 5.9: Employees in R&D paying national insurance contributions from 1997 to 2003

	Employees in R&D		Share of employees in R&D		Changes between 1997-2003 (in %)
	1997	2003	1997	2003	
Munich City	28,965	29,367	4,55	4,36	-4.17
Dachau	510	693	2,04	2,42	18.18
Ebersberg	117	363	0,49	1,23	153.32
Erding		73	-	0,29	-
Freising	320	591	0,58	0,90	53.96
Fürstfeldbruck	279	90	0,76	0,24	-67.90
Landsberg am Lech		455	-	1,71	-
München	2,809	2,119	2,07	1,34	-35.19
Starnberg	1,492	1,657	4,60	4,70	2.30
Region of Munich (altogether)	34,492	35,408	3,47	3,28	-5.60

Source: Stifterverband Wissenschaftsstatistik, 2006, own calculations

Table 5.10: Expenditure on R&D and proportion of R&D expenditure in relation to GDP (1997 to 2003)

	Expenditure for R&D (in 1,000 €)		Share of R&D- Expenditure in relation to GDP		Changes between 1997-2003 (in %)
	1997	2003	1997	2003	
Munich City	3,178,103	3,916,435	5,63	6,02	7.02
Dachau	46,917	54,337	2,37	1,97	-16.84
Ebersberg	7,269	61,222	0,35	2,36	568.78
Erding	-	5,252	-	0,21	-
Freising	29,622	67,976	0,58	1,11	91.59
Fürstenfeldbruck	20,172	9,615	0,64	0,27	-58.02
Landsberg am Lech	-	56,807	-	2,32	-
München	311,401	272,294	2,00	1,08	-45.91
Starnberg	163,010	214,518	5,02	5,59	11.53
Region of Munich (together)	3,756,494	4,658,456	4,10	4,08	-0.31

Source: Stifterverband Wissenschaftsstatistik, 2006, own calculations

5.2 Discussion of sub-sectors of the creative knowledge sector

5.2.1 The Media

As no studies of the creative industries according to the above definition exist, the media – which forms an important sub-sector of the creative industries in the Munich region – will be discussed in more detail in the following section.

The Munich region is considered to be one of the most important media centres in Germany alongside Cologne, Hamburg, Berlin and Düsseldorf. Whereas each of these four cities has a stronger specialisation in a specific sector of the media industry (for example the magazine sector in Hamburg, the radio and TV sector in Cologne and the advertising sector in Düsseldorf), Munich has the broadest media range and the greatest functional diversity (Biehler et al. 2003; Sträter, 1999). Media has developed into one of the most important sectors of the economy of the Munich region in the last two decades (Biehler et al. 2003) and hardly any other city in Germany has profited more from the media boom during the last few decades.

According to the studies conducted in 1995, 1999 and 2002 by the City of Munich and the Chamber of Industry and Commerce (IHK) for Munich and Upper Bavaria, the development of the media industry was very positive (see table 5.11) from 1995 to 2002 (LH München & IHK, 2003).

Table 5.11: Enterprises, employees and turnover in the media industry 1995 – 2002 (City of Munich and Munich administrative district [*Landkreis München*])

Year	1995	1999	2002	Changes 1999 - 2002 in %
Employees (permanent)	72,060	80,997	94,060	13.9
Employees (freelance)	28,700	34,311	80,367	134.2
Enterprises	6,697	8,855	11,339	28
Turnover in Mio Euros	12,806	17,959	23,231	29.4

Source: LH München & IHK, 2003

In the year 2002, 11,339 media enterprises were active in the Munich region (see table 5.11), generating a turnover of over 23,231 million Euros³. The table shows very clearly that contrary to the general trend in the industry in Germany, the print, multimedia, advertising and information services sectors have been growing in Munich over recent years. However, due to the crises of 2000, levels of freelance workers have risen disproportionately and certainly at the expense of permanent staff – a finding that has also been suggested by the data analysed in section 5.1.

The Munich media sector consists primarily of small and medium-sized companies with some bigger companies that represent a considerable percentage of the media employees (LH München & IHK, 2003).

The printing and publishing sector is the traditional main pillar of the local media industry. Munich is very strong in newspaper publishing. Five daily newspapers with a total circulation of 1.2 million are published in Munich, some of them with a supra-regional readership. Furthermore, judged by the number of editorial offices, titles and publishing companies, Munich ranks second after Hamburg in the magazine publishing sector (von Streit, 2003). Munich also ranks first in Germany in book publishing: in 2003, a total of 234 Munich-based publishers put out the largest number of all titles in Germany (8,527) (Hafner, Schier & von Streit, 2005).

Furthermore, the Munich region is a centre for film and TV production in Germany. The film/ radio/ TV sector has had the highest growth rates in personnel among all sub-sectors of the media industry in the last few years (Sargl, 2003), a development which started with the liberalisation of the TV and radio sector in the 1980s (Sträter 1999). Nowadays, in addition to the two public broadcasters, *Bayerischer Rundfunk* (with over 4,000 permanent and freelance radio and television workers) and *Zweites Deutsches Fernsehen* (ZDF), many national as well as some international private broadcasters maintain a presence in Munich (von Streit, 2003). The Munich region enjoys a very strong position in the German film industry. In terms of turnover, Munich is number one in Germany, with a share of 44 percent of total German turnover; in terms of employment or businesses it has a share of 23 percent of total German employment or businesses (Seufert, 2002).

The advertising industry is represented in Munich to a lesser extent than in other locations such as Düsseldorf, for example. However, the advertising industry has changed and is changing with the development of new media and communication technologies, so that many advertising companies will increasingly compete against multimedia agencies (Sträter 1999). According to experts and the *iBusiness Jahrbuch 2006*, there exist around 200

³ Due to different databases, the numbers of this study cannot be compared with the data discussed in section 5.1

multimedia enterprises in the Munich region, which means that Munich has become one of the leading multimedia centres in Germany alongside Berlin, Hamburg, Cologne and Düsseldorf. Most of these 200 businesses are small businesses with fewer than 30 employees.

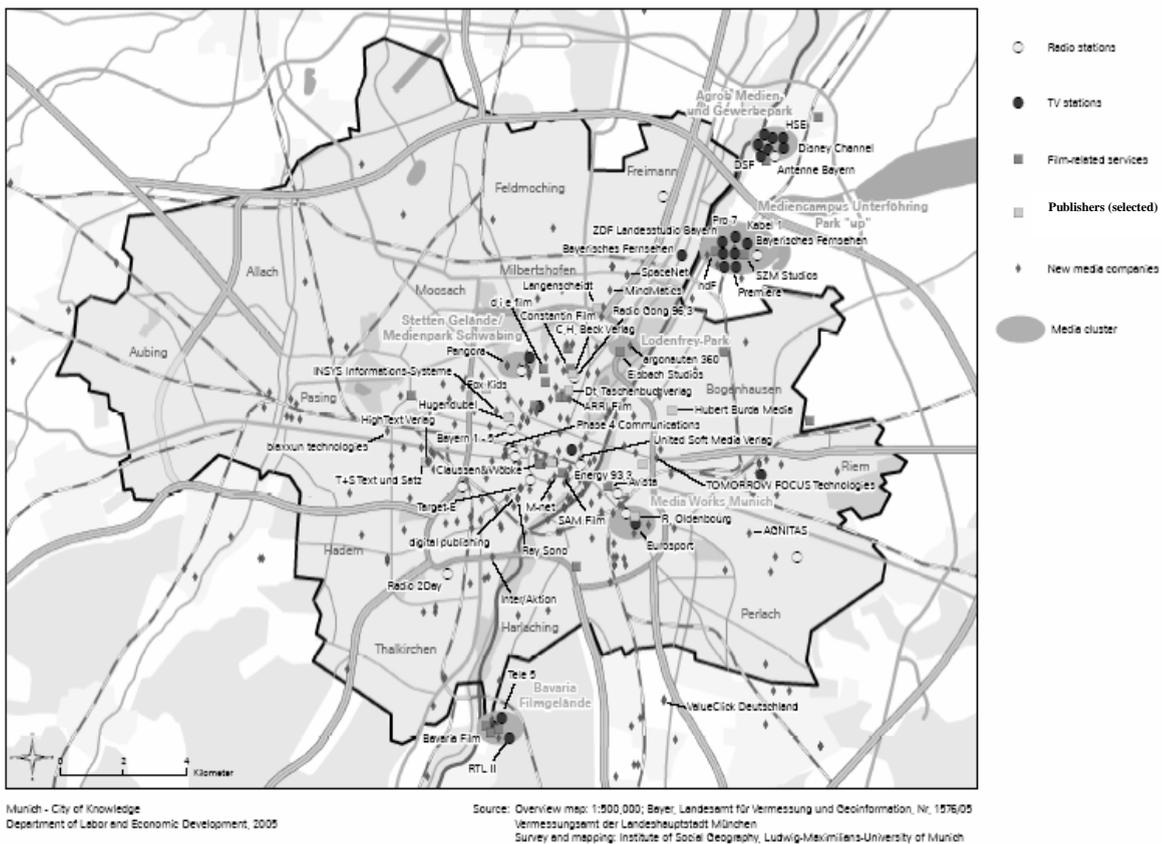
Can the concept of path dependency be applied to the media industry of Munich? There certainly are several historical circumstances that have created a positive climate for the development of this industry in the Munich region, so it seems appropriate to apply this concept. Firstly, with regard to technological origins, these include the inventions and developments achieved in Munich in the late 18th and early 19th centuries, which promoted the establishment of businesses manufacturing cameras, lenses and photographic material (some of these enterprises still exist today, such as ARRI or Rodenstock). Secondly, political reasons can be seen in Munich's role as state capital and the promotion of cultural institutions, at first by the kings and later by the Bavarian government. Other factors are the growth of the defence industry in Munich in the 1960s and 1970s, which attracted a large number of foreign companies such as Texas Instruments and Motorola. A broad range of software enterprises, such as Microsoft Deutschland, has settled around them. The links between the media and the software industry are therefore particularly strong in Munich.

Concerning the cluster concept, Biehler et al. (2003) regard the Munich media industry as a strong cluster made up mainly of small and medium-sized companies, with some 30 large scale enterprises. In terms of their influence and turnover, these large-scale enterprises can be regarded as 'global players'. They form the nodes of the network made up by the Munich media companies. For the interaction of the enterprises, the branches are less important than their functional co-operation (Biehler et al. 2003). Furthermore, numerous associations come together to represent the interests of their respective customers in the different sectors of the media industry (Sträter 1999, Sargl 2003). The cluster is completed by a broad range of training and support facilities for media professions. There are no fewer than 30 different school and further education facilities, including the famous *Hochschule für Fernsehen und Film* (HFF) or the *Deutsche Journalistenschule* (von Streit, 2003).

Concerning the spatial concentration of the media industry, the media enterprises are almost entirely concentrated in the city of Munich as well as in the northern, eastern and southern parts of the adjacent Munich county administrative district [*Landkreis München*]. Furthermore, the different sectors of the media industry have developed special locational profiles. The publishing houses as well as the multimedia enterprises are concentrated in the inner city. The same applies for the film production and distribution enterprises. For these enterprises, proximity to other companies and a thriving urban culture is important (Sargl, 2003). The TV and radio stations are located either in the inner city or in the neighbouring municipalities of Unterföhring, Ismaning or Grünwald, where spatially concentrated media clusters have developed (see figure 5.4)⁴.

⁴ One cluster developed in the municipality of Unterföhring around the former Kirch group; another cluster developed around the Bavarian Studio GmbH (Studio facilities) in Grünwald.

Figure 5.4: Media in the Munich area

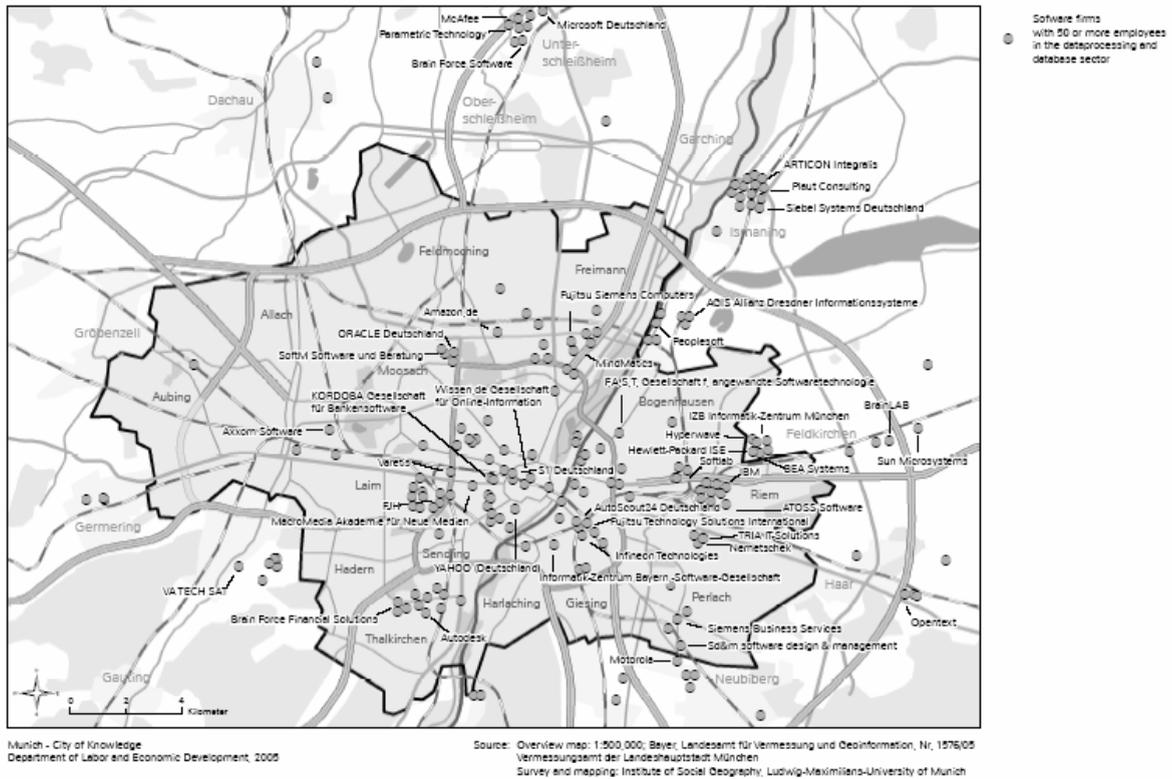


Source: Hafner, Schier & von Streit, 2005

5.2.2 Information and Communication Technology

Large companies such as Siemens AG, and big international players with a branch or a subsidiary in Germany, e.g. Microsoft Deutschland in Unterschleissheim or Cisco Systems GmbH in Hallbergmoos, have a formative influence on the IT industry in the area of Munich (see figure 5.5). Furthermore, numerous small and medium-sized IT companies providing highly specialised products or services are also typical of Munich.

Figure 5.5: Software companies in the Munich area



Source: Hafner, Schier & von Streit, 2005

According to a study carried out in 2004 by the City of Munich and the Chamber of Industry and Commerce (IHK) for Munich and Upper Bavaria, the development of the information and communication technology (ICT) sector has been very positive in the Munich region (in this study, planning region 14) in recent years. At the end of 2003, the Munich region's ICT sector comprised 22,682 companies, up 26 per cent from 1999. These companies had a total workforce of nearly 395,000 (1999: 260,000), and had sales of 70 billion Euros in 2003 (1999: 61 billion Euros) (LH München & IHK, 2004).

One reason for these considerable increases is that this study has for the first time also incorporated the media sector, in order to take into account the increasing merging of the media and ICT industries.

Taking a closer look at the sub-sectors, over a third of the companies in the Munich region focus on software, data and IT services and e-commerce. The advertising, market communication and research sector comes in second, and is followed in third place by the media (see table 5.12).

Table 5.12: The ICT industry in the Munich region

Number of firms	Munich city and administrative district (Landkreis)	Surrounding administrative districts	Total	Percentage Munich region (rest of the planning region)	Percentage of ICT industry
Overall	16,640	6,042	22,682	73	100
Media	3,781	908	4,689	81	21
Software	5,557	2,697	8,254	67	36
Advertising	5,034	1,550	6,584	77	29
Journalism	359	86	445	81	2
Cable and network operations	115	47	162	71	0.7
Components	102	63	165	62	0.8
Hardware and peripherals	627	309	936	67	4
Distribution	1,065	382	1,447	74	6

Source: LH München & IHK, 2004

With about 8,300 companies, software and related services make up the largest subdivision in the ICT industry in the Munich region, as measured by the number of companies. The software industry had a total turnover exceeding ten billion Euros in 2003, which is 15 percent of the total earnings of the German ICT industry. Furthermore, it is a major employer in the region: in the last few years the number of (permanent) employees has risen from 47,544 in 1999 to 54,021 in 2003. The software industry is less concentrated in the inner city than for example the media industry (see table 5.12). Concentrations of software enterprises are found in the northern and eastern neighbouring municipalities of Unterföhring, Ismaning or Feldkirchen (see figure 5.5).

Munich is the second largest telecommunication centre in Germany, after Frankfurt. Although this sector comprised only around 160 firms in the Munich area, it achieved a turnover of 14.7 billion Euros in 2003, one fifth of the total revenue of the Munich-based information and communication sector. The investments amounted to about 3.1 billion Euros and the industry employed just under 19,000 people (LH München & IHK 2004). The sector in Munich is formed by small-scale service providers and shops, but also by major cable and network operators with global activities, e.g. Siemens AG, O2 GmbH, or BT Germany.

Up to now, there have been no scientific studies analysing the extent to which the ICT sector in Munich forms a cluster, and what the interaction between the actors in this cluster is like. However, it can be argued that ICT firms find Munich a site with very good location conditions: they can hire highly qualified personnel, and make use of specialised infrastructure, e.g. technology transfer points and an extensive potential customer base. Users of software and telecommunication systems are the other knowledge-intensive and technology-intensive sectors (see chapter 4), e.g. biotechnology, medicine, the aerospace industry, media firms, the automotive sector, producers of car electronic equipment, and mechanical engineering companies. Furthermore, numerous spin-offs of the computer science

departments at Munich's universities and colleges add to the growth of the industry. Political and financial support is available to the industry under the Bavarian Software Initiative, initiated by the Bavarian state government in 1998 (see chapter 6).

5.2.3 Finances

After Frankfurt, Munich is Germany's second most important centre in the banking sector, the number one place for insurance companies, and also a top location for asset management firms, funds, leasing companies and venture capital firms. In 2003, over 60,000 people, i.e. over nine percent of all employees paying national insurance contributions in Munich, were employed in the loan/credit and insurance sectors (Hafner, Schier & von Streit, 2005).

Almost 80 insurance companies have their headquarters in Munich. They include large groups such as Allianz, the world's largest primary insurer, D.A.S., Europe's largest defence insurer, and the Bavarian insurance chamber, the biggest public-law insurance group in Germany. Reinsurance companies have a particularly strong presence in Munich: Munich Re (*Münchner Rück*), the world's largest reinsurance company, has headquarters in Munich. Other companies in this sector, such as Swiss Re or GE Frankona Re, manage their business activities from Munich. Just over 60 percent of the reinsurance business in Germany, viz. some 33 billion Euros a year, was handled in the Munich area in 2003 (see figure 5.6).

The asset management sector of the insurance groups and the companies formed for this purpose handled some 860 billion Euros in 2000. Thus, Munich now ranks before Frankfurt am Main in asset management. Furthermore, some 160 banks can be found in Munich; about 50 of them manage their business from a Munich HQ.

Munich is also a preferred place for domestic and foreign venture capital firms. Almost one in two venture capital firms in Germany is headquartered in Munich. Venture capital is a 'must' for innovative and knowledge-based start-ups, which often do not have the necessary capital to fund their business. Reasons why venture capital firms find Munich most attractive are, for one, the large number of young, innovative companies – at present, one in three firms financed with venture capital is located in the Munich area; secondly, the presence of capital available for new forms of investment (Hafner, Schier & von Streit, 2005). As shown in map, the financial centre of Munich is clearly situated in the inner city, as the headquarters of banks, insurance companies and venture capital companies look for prestigious sites in the centre of the old city.

Figure 5.6: Munich financial hub



Source: Hafner, Schier & von Streit, 2005

5.2 Location factors for the creative knowledge industries

The attractiveness of Munich for the creative knowledge industries is based on a number of specific hard and soft location factors, which are either general location advantages or are of special importance to knowledge-intensive creative industries.

5.2.1 Knowledge base and the ability to create knowledge

One important factor especially for knowledge-intensive industries is the comprehensive range of qualified staff and a creative labour pool. The educational level of the population in Munich is high in comparison with other German cities. More than 20.1 percent of the working population have a university degree (INSM, 2006). Furthermore, the city has a large number of knowledge institutions – universities as well as public and semi-public research establishments.

Munich has eleven universities, colleges and universities of applied science with over 90,000 students (see table 5.13). This makes Munich the second-largest university centre in Germany, after Berlin.

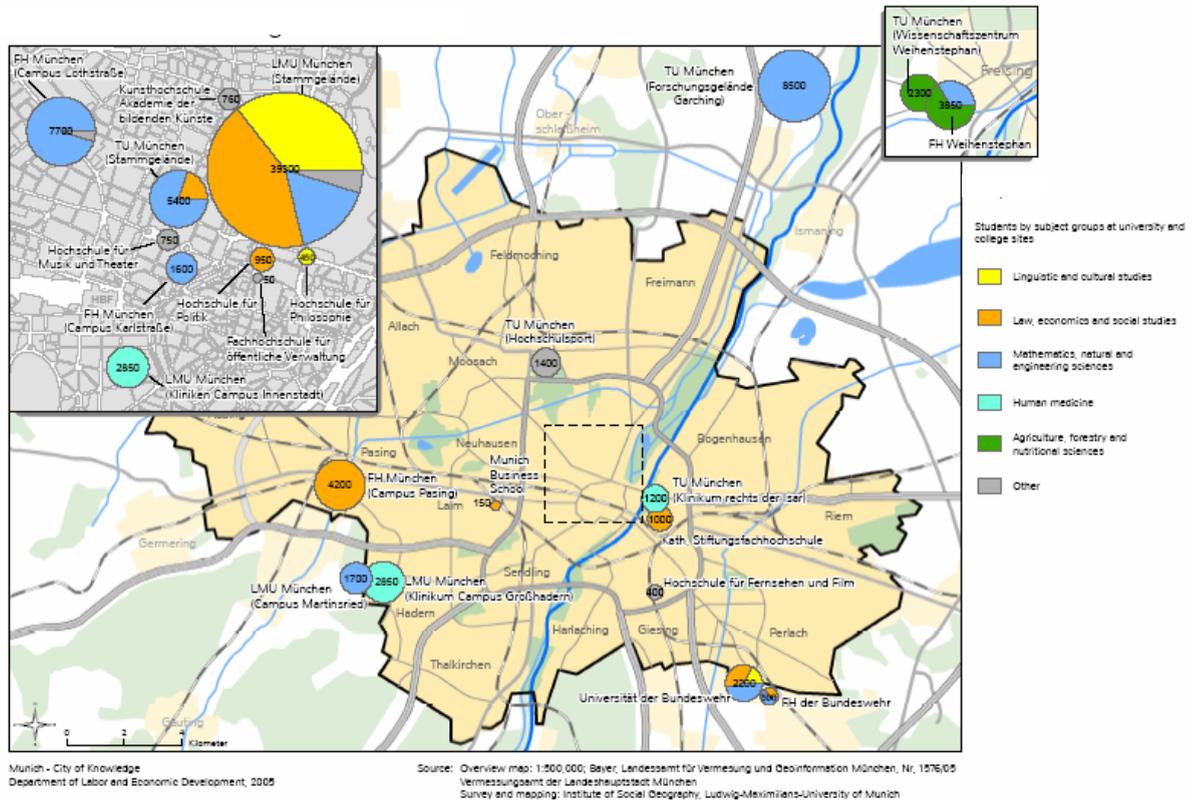
Table 5.13: Universities in the Munich region

University	Number of Students
Ludwig – Maximilian – University	46,203
Technical University Munich	19,887
Bundeswehr University	2,903
Munich Institute of Higher Education for Politics	936
Munich School of Philosophy	447
Academy of Fine Arts	689
University of Music and Performing Arts	757
Munich Academy for Television and Film	386
Munich University of Applied Sciences	13,037
Stiftungsfachhochschule München	1,688
Munich Business School	152
Total	87,085

Source: Bavarian State Office for Statistics and Data Processing, 2006

The most traditional and largest university in Munich is Ludwig-Maximilian-University (LMU), with a current student population of some 46,000 – 16 percent of them from abroad. More than 800 lecturers teach in 18 departments. The LMU attracts academics representing the humanities, social and cultural sciences, and is a strong centre for the training of students in medicine, law and the natural sciences. The university management and administration, and the social, cultural and economics departments of LMU are located in downtown Munich (see map 5). However, there is a strong trend towards decentralising whole departments. Since the 1970s, new buildings requiring more land, such as the departments of medicine, veterinary medicine, biochemistry and physics, have been built at the outskirts of the city, in München-Großhadern or to the north of Munich, in Oberschleissheim, Garching and Freising. An important biotechnology centre has been built on the newly established HighTechCampus LMU in Martinsried, in direct proximity to the hospital complex of Grosshadern (see figure 5.7).

Figure 5.7: Universities and colleges in Munich



Source: Hafner, Schier & von Streit, 2005

Munich's second-largest university, the Technical University (TU), is an internationally renowned research university with about 20,000 students, 20 percent of whom come from other countries. The core competencies of the TU are in the natural sciences and technology, medicine and the life sciences. The university management and administration, as well as the engineering, economics and sport sciences departments, architecture and medicine, are located in the centre of Munich. Located 30 km away from Munich, in Freising-Weihenstephan, is the Weihenstephan Centre for Life and Food Science (WZW). The TU campus with the departments of physics, chemistry and mechanical engineering, mathematics and computer science is 15 km away, in Garching (Hafner, Schier & von Streit, 2005).

In addition to the universities, Munich has a high density of public research establishments in the natural sciences, economics and social sciences: 25 institutes of the Max Planck Society, the Fraunhofer Society, the Helmholtz Association and the Leibniz Association have settled in Munich. They are important factors in the successful development of the knowledge-intensive clusters in the city. The spatial proximity of the institutes to the technology-based companies enables research co-operation and the transfer of knowledge, to boost the innovation potential of industry. The 13 Munich-based institutes of the Max Planck Society which are engaged in research in the natural and life sciences have some 3,750 employees. The Max Planck institutes for biochemistry und neurobiology in Grosshadern-Martinsried, for example, support the small and medium-sized companies of the so-called red biotechnology sector with their medical and pharmaceutical research.

Whereas the Max Planck Society concentrates on pure research, the Fraunhofer Society focuses on application-oriented research in the engineering disciplines. Five research establishments are based in Munich, among them the society's headquarters and its patent centre, which provides consultancy and financial support to companies in obtaining patents for their inventions from the German and European patent offices.

An analysis of the number of patent registrations suggests that the region of Munich is one of the most innovative regions in Germany. With 1,508 patent registrations per million inhabitants, Munich ranks second in Germany after Stuttgart with 1,790 in 2006 (Greif, 2006). Although a high number of patent applications can be regarded as an indicator of intensive research and development activities in a region, it should be interpreted with caution, as the data do not necessarily refer to the location where the invention was made but to where it has been registered. Most patents from Munich-based applicants are filed for inventions in electrical engineering, electronics and radio communication, health, instrumentation and control systems. Furthermore, Munich is also consistently consolidating its leading position in the field of biotechnology patents, with eleven percent of all domestic patent applications in biotechnology. Looking at the patent applications by categories of applicant, i.e. industry, science or private inventors, it will be seen that most applications are the result of industrial research (Hafner, Schier & von Streit 2005).

5.2.2 Accessibility

Munich has a very good accessibility by road, train and plane. With the construction of the new airport in 1992, a high-capacity international airport became available. Since business started, the number of flights and passengers has risen continually. From 12.7 million in 1993, the figure rose to well over 26.4 million passengers in 2004; the number of flights went up from 192,200 in 1993 to 383,100 in 2004 (Hafner, Schier & von Streit, 2005). In the passenger statistics, as a passenger airport Munich airport ranks second after Frankfurt on the Main.

Munich airport is also a major driving force of economic development in the north of the Munich region: over 23,000 people have jobs there. Munich is connected to the high speed railway system and Munich's central station is the second busiest in the country, offering 350 trains everyday. Furthermore, Munich has an efficient public transport system with a dense metro network and tram system. However, especially the S-Bahn (urban railway) which connects the city with the region needs to be expanded and upgraded, firstly because it has not kept pace with the growth of residential settlement in the region, and secondly because congestion is an increasing problem in the Munich region (Kagermeier et al., 2001).

5.2.3 Soft Location Factors: Quality of Life, Cultural Life and Cultural Diversity

According to Richard Florida (2004, 2005a, 2005b) soft location factors such as a thriving urban atmosphere or a wide variety of cultural and leisure facilities are important for attracting and retaining creative knowledge workers. These groups are said to look for an urban ambience, which is regarded as fertile ground for creativity and diversity.

Munich is well known for its excellent cultural and leisure facilities and its high standard of living in general. This is at least the image of Munich which is continually

reproduced in city rankings (INSM, 2006). Indeed, Munich offers a wide variety of cultural and leisure opportunities, and the Isar River as well as many parks and green spaces in the middle of the city provide an exceptionally wide range of sporting and recreational opportunities. The surroundings of Munich too are widely appreciated: the Alps are very close, and there are many lakes in and near the city. The high quality of life is also related to the fact that with 9 criminal offences per 100,000 inhabitants, Munich has the lowest crime rate of all large cities in Germany (INSM, 2006).

The city offers plenty of cultural amenities, especially the formal institutions of 'high culture'. The major museums focus on natural science and technological areas, whilst others concentrate on history, including cultural history. One of the city's best known and most spectacular museums is the 'German Museum' (*Deutsches Museum*), the world's largest museum of science and technology, which attracted more than 1 million visitors in 2005 (Statistical Office Munich, 2007). Also very famous are the Old Pinakothek, one of the oldest art galleries in the world with more than 800 masterpieces by European artists; the New Pinakothek with European art and sculpture from the late 18th to the early 20th centuries; and the Pinakothek der Moderne, showing contemporary arts, architecture and design. More than one million people visited the three Pinakotheks in 2004 (Statistical office of Munich, 2007). The varied museum scene is financed primarily by the state of Bavaria or by state-run institutions and by foundations. The Bavarian capital also has many municipal museums: the Münchner Stadtmuseum (Munich Municipal Museum), the Villa Stuck, the Lenbachhaus, and the Münchner Jüdisches Museum (Jewish Museum) (Hafner, Schier & von Streit, 2005). In 2007, the new Jewish Museum, which is part of a new municipal building project on St.-Jakobs-Platz in the centre of the city, will open its doors (Israelitische Kultusgemeinde, 2004). Alongside museums, theatres, opera houses and concert halls are considered to be centres of the creative formation and presentation of cultural knowledge. Munich also has a lively theatre scene, with about 100 theatres and venues for musical performance. The top of the range are the large institutions such as the National Theatre (*Nationaltheater*), the State Theatre (*Staatstheater*), the Munich Chamber Theatre (*Münchner Kammerspiele*), the German Theatre (Deutsches Theater), the Philharmonie and the Residenz Theater. More than 1.5 million people visited the state-run and municipally-run theatres in 2004-2005 (Statistical Office of Munich, 2007). Munich also offers also opportunities for the development of experimental theatre, popular theatre and cabaret with its numerous studio theatres and playhouses.

With regard to 'high culture', Munich's qualities are certainly excellent, although Munich does not have the image of being a very 'diverse' city from a (sub-)cultural point of view. The image of Munich is that of a very wealthy, relaxed city almost like a big village, but it is not seen as being especially 'funky' or having a vibrant nightlife and clubbing scene. Nevertheless, Munich nightlife offers over 6.000 licensed establishments in the city, and in the old part of the city in particular, many clubs and bars have opened in recent years. Areas such as the Kunstpark Fröttmaning also offer a lively nightlife for young people.

Nor does Munich have the image of being a very international city with many ethnic groups, which is astonishing because with an percentage of foreigners of 24.2, Munich is one of the cities with the highest quota of foreigners in Germany, followed by Stuttgart with 23.66 percent and Frankfurt with 21.91 percent in 2006 (BAA, 2006).

However, Munich has a big gay and lesbian scene: about 100.000 gays and lesbians make up the city scene, concentrated especially around the Gärtnerplatz quarter (LH

München, 2007e). After Berlin and Cologne, Munich is the city with the third biggest gay scene in Germany. Gay tourists also appreciate Munich's openness and gay scene (Popien, 2003). For the first time in German history, a gay-rights political party, Rosa Liste (*Pink List*), has become one of the governing parties (together with SPD and the Greens). Founded in 1989, the Pink List finally entered Munich's municipal council (*Münchner Stadtrat*) in 1996 with 1.8% of the votes, and in 2002 the party gained 2% of the votes. In the city district Ludwigvorstadt-Isarvorstadt, where the core of Munich's gay scene is located, the Pink party achieved 11% of the votes in 2002 (Popien, 2003; LH München, 2007e). Furthermore, Munich offers plenty of contact points and counselling for gays, e.g. SUB (*Schwule Kommunikations- und Kulturzentrum* [Gay communication and cultural centre]), many sport clubs such as L.U.S.T. (*Lesben und Schwule tanzen* [Lesbians and Gays dance]), and for over 25 years the city has celebrated Christopher Street Day (CSD), the largest event for the gay community (Popien, 2003).

However, the people's diversity (immigrants, young artists, hip and trendy youngsters) does not form a very visible part of the city's street image. This is also in part due to high rents and house prices, which rank among the highest in Germany and make it very difficult to find cheap locations for artistic experimentation (van den Berg et al., 2005).

Munich is an important tourist destination. The most famous attractions are the Oktoberfest Beer Festival, which attracts some 6.5 million visitors a year, the historical city centre and the pedestrian shopping zone, as well as the newly built Allianz Arena. In relation to tourism, 2005 was the most successful year ever. For the first time, more than 8 million overnight stays were recorded, and about 91.5 million visitors came to the Bavarian capital. These included 83 million day trippers and business travellers, and 8.5 million people stayed overnight. The top ten places of origin of foreign tourists are the USA (238,000 arrivals and 564,000 overnight stays in 2004), followed by Italy (179,000 arrivals, 367,000 overnight stays in 2004), Great Britain/Northern Ireland, Switzerland and Austria (LH München, 2006f).

To sum up, the Munich region can be considered to be one of the German leading locations for the creative knowledge industry. One third of all employees subject to social insurance contributions in the Munich region work in the creative knowledge sector, in the city of Munich it is even a percentage of 37 of all employees. Almost 13 percent of the workforce are employed in the creative industries, 7 percent in finances, the second biggest subsector of the creative industries in Munich. Whereas the creative industries are characterised by small and medium firms, finances is mostly made up by big firms. Regarding the development of the creative knowledge economy over the years 1996 to 2004 the turnover as well as the number of firms has developed positively despite the crises of 2001.

Regarding the sub-sectors of the creative knowledge sector, several sub-sectors show strong cluster tendencies like the media as well as ICT and finances. Due to the increasing merging of the ICT industries and the media, both clusters complement another very successfully in the Munich region.

The high education level of the population, excellent transport infrastructure and a good accessibility as well as the high number of public and semi-public research establishments contribute to the attractiveness of the Munich region for the creative knowledge industries.

Concerning soft location factors Munich offers excellent cultural and leisure facilities. However, Munich has not the image of being a highly 'diverse' city from a (sub-)cultural point of view.

6 IMPROVING COMPETITIVENESS IN THE MUNICH REGION: POLICIES AND CHALLENGES

The state of Bavaria and the City of Munich together deploy an impressive variety of policies that are directed at improving entrepreneurship, commercialising knowledge and creating networks of innovation, but in Germany the regional governments (*Länder*) are largely responsible for R&D and education policy. With regard to financial means therefore, the state of Bavaria is much more active in the Munich region than the city.

These different players and their more or less co-ordinated political strategies relating to the promotion of innovation and improving competitiveness will be analysed. In the second part, the central challenges for the growth model for Munich will be discussed.

6.1 Policies of the state of Bavaria

Technology and innovation policies have a long tradition in the state of Bavaria. In the 1950s and 1960s, important location decisions relating to technology policy benefited Munich, such as the establishment of the Federal German research and development institutions, and the promotion of the armaments industry through the award of public sector contracts worth billions to Bavarian enterprises. The establishment of the state agency for development financing (*Landesanstalt für Aufbaufinanzierung – LfA*) in 1951 also represented a central element of Bavarian economic policy, since for 50 years, Bavaria's own bank has supported in particular medium-sized industry, which is characteristic of Bavaria. Through this, the structural change from an agricultural state to a high-tech industrial state has experienced marked acceleration (see chapter 6.2).

In the 1980s, the Bavarian regional government set up programmes for targeted support of innovation and technology, namely the Bavarian Innovation Programme (BayIP) and the Bavarian Technology Introduction Programme (BayTEP), which in 2000 were combined to form the Bavarian Technology Programme (BayTP). The BayTP programme financially supports the transition of new technologies into profitable products and services.

In the 1990s, research and development policy gained new impetus. The Bavarian government started two new programmes: the 'Future Bavaria Initiative' (*'Offensive Zukunft Bayern'*) and the 'High-Tech Initiative'. The Bavarian government, under the leadership of Edmund Stoiber, the Bavarian minister-president newly-elected in 1993, sold public shares to the value of 8,000 million Deutschmarks, in order – with the aid of public investment – to strengthen Bavaria as a location in the increasing world-wide competition for locations. Together, the two initiatives accounted for around 4 billion Euros (2.9 billion Euros for the Future Bavaria Initiative) (Bayerische Staatskanzlei, 2006a und 2006b). The money is spent on R&D, training and infrastructure, and aims at making Bavaria an even more attractive location for the high-tech industry.

The priorities of the state campaign ‘Future Bavaria Initiative’, which ran from 1994 to 1999, were:

- Investment in the technological infrastructure: universities
- Promotion of co-operation between business and science
- Stimulation of networks to support technology transfer
- Support for start-ups: start-up centres, venture capital, patenting advice, business plan competitions, promotion of university spin-offs

6.1.1 The High-Tech Initiative

The High-Tech Initiative continues the programme of ‘Future Bavaria Initiative’. At the end of 1999, Bavaria decided on a programme which was to be unique in Germany: around 1.35 billion Euros has been invested in this project in order to continue the expansion of Bavaria’s pioneering technological fields, and to maintain the state’s outstanding position in terms of the economy and employment policy. The High-Tech Initiative concentrates its support on various key technologies, including among others life sciences, ICT, environmental technology and mechatronics (Bayerische Staatskanzlei, 2006a). The initiative has four pillars, which attract the following investment amounts:

Table 6.1: Four pillars of the High-Tech Initiative

Pillar 1: Expansion of world-class high-tech centres	€663.6 million
Pillar 2: Technology concepts for all governmental districts (‘Regional concepts’)	€179.0 million
Pillar 3: A state-wide programme of qualification, start-up promotion and technological infrastructure	€267.4 million
Pillar 4: Internationalisation of the High-Tech Initiative	€65.5 million
To these is added a Location programme (state road construction, expansion of airstrips)	€175.4 million

Source: Bayerische Staatskanzlei, 2006a

In the following part, pillar 1 and 3, the pillars with the highest funding, will be looked at more closely:

Pillar 1: Projects in pillar 1 aim at supporting high-tech centres in the fields of life science, information and communications technology (ICT), new materials, environmental technology and mechatronics. Projects supported in the area of Munich are e.g.

- **Start up centres:** The Bavarian State has financed four start-up centres in the Munich region. They offer a variety of forms of start-up support as well as technology transfer points which encourage the intensive networking of science and industry. They assist in the search for suitable co-operation partners, make contacts with holders of expertise, give patenting and financing advice, and engage in active knowledge transfer (Hafner, Schier & von Streit, 2005). One of them is GATE (*Garching Technologie und Transfer Zentrum*), a centre for start-ups since 2002, situated in the north-east of Munich, in Garching. It is located near Munich Technical University, offering young high-tech enterprises good conditions for a successful business start,

especially in ICT (gate, 2007). The state of Bavaria has supported two other innovation and start-up centres in the field of biotechnology, the IZB Freising concentrating on green biotechnology and the IZB Martinsried concentrating on red biotechnology. Both centres are also located close to the life science research centres of the universities.

- **Promotion of innovative networks:** Another field of activity is that of policy initiatives aimed at improving co-operation between firms and universities, and making more of the regional knowledge base. One example is the ‘Software Initiative’, which supports research and development and training in the field of information and communication technologies. The initiative also aims to stimulate high-growth start-ups in the software industry, making Bavaria a top location for dynamic young businesses in the information and communications sectors (Software Initiative Bayern, 2006). In the period from 2000 to 2004, the Software Initiative was funded to 51 billion Euros (Software Forum Bayern, 2003). Another example is Bio^M AG, which is a financing, service and consulting company whose aim is to promote the development of the BioTech-Region München as an internationally renowned centre of excellence in the field of innovative biotechnology. The Bio^M network includes all important players in the region (representatives from public offices, scientific institutions, venture capitalists and biotech companies), and Bio^M also assists Munich-based companies in finding the right contacts and partners (Bio^M AG, 2007).
- **New university buildings:** Examples in the Munich region are the relocation of university departments (mechanical engineering, IT and mathematics) of the Technical University out of the city centre to Garching, to the north of the city, and the creation of a biotechnology cluster in Martinsried in the south-west of Munich, where Bavaria has financed the new construction of the departments of Chemistry and Pharmacy of the Ludwig-Maximilian University (LMU).

Pillar 3: Pillar 3 aims at the promotion of start-ups and technological infrastructure as well as qualification:

- **Start-up programmes to raise entrepreneurial awareness:** One example is the FLÜGGE programme (*‘Förderprogramm zum leichteren Übergang in eine Gründerexistenz’* [Bavarian support scheme for facilitating start-up transition]). It aims to increase the numbers of spin-offs from universities, and it supports for example the technology transfer centre at the Ludwig-Maximilian University. Another example is the Munich Business Plan Competition (*Münchener Business Plan Wettbewerb* (MBPW)), which awards prizes to exceptional business plans and has been held since 1995. The awards have already helped many technology-oriented firms to become successful (LH München, 2002b). This programme is also supported by the City of Munich. Another Munich-based network is the Munich Business Angel Network, which is an informal, regional platform for business start-ups, and which supports innovative and technological service companies in their early days (Software Initiative Bayern, 2007).

Although the efforts of the High Tech Initiative were directed at the entire territory of Bavaria, many of these investments have benefited the city and the Munich region, since the

Munich region has the highest concentration of knowledge-intensive firms, university institutes and research institutions.

6.1.2 The Bavaria Cluster Campaign

Since February 2006, the *Cluster Initiative* (Bavaria's cluster campaign) has implemented a subsequent stage of Bavarian innovation and economic policy. The cluster campaign is a new feature of the modernisation strategy designed to enhance Bavaria's role as a top location for business and science, which systematically follows on from the Bavarian High-Tech Initiative. Its aim is to build state-wide networks interlinking business and scientific potential in 19 defined clusters of industry and competence, and thus to activate innovation and productivity potential in these clusters.

The clusters are classified into three basic types:

Table 6.2: Cluster types

High-tech clusters	Production-oriented clusters	Cross-sector technologies
Biotechnology	Automotive engineering	Nanotechnology
Aerospace	Chemicals	New materials
Satellite navigation	Sensor technology and power electronics	Mechatronics/ Robotics/ Efficient production systems
ICT	Nutrition	
Environmental technology	Forestry and woodland	
Medical technology	Media	
	Financial services	
	Energy technology	
	Railway technology	
	Logistics	

Source: Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology, 2006d

According to the Bavarian government, the 19 clusters already provide a substantial degree of competence in terms of:

- universal value-creation chains
- an environment consisting of major user sectors
- efficiency and application-orientation in research
- availability of highly qualified staff

For each Bavarian cluster, platforms are created that bring together companies, research establishments and universities, permit intensive co-operation, and hence release innovative potential. The main tasks of the co-operation platforms are to establish and maintain a contact network of companies, research establishments, associations, investors, support institutions, consultants and other players in the cluster in question. In order to ensure that the co-operation platforms can function successfully, the cluster spokesmen and the cluster management specifically build structures for contact and communication between industry and science as the motors driving the cluster process, and encourage innovative projects. The relevant cluster management is the contact partner throughout Bavaria for the existing cluster

networks. It assists with the organisation of events, promotes the creation of thematic profiles and development of potential, and highlights new fields of application and projects, the implementation of which is then left to the discretion and responsibility of the cluster companies.

The cluster strategy is a state initiative for ‘stimulating a self-reinforcing growth process, whose concrete outline conditions are worked out and brought to life by the protagonists in the cluster’ (Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology, 2006d, p. 12). For this, a financial involvement is expected from the players in the cluster, since the financial provision of 50 million Euros is intended only for covering the costs of the cluster management. Projects that are initiated are intended to be jointly supported by the enterprises (Stoiber, 2006). Although the efforts of the cluster initiative are directed at the entire territory of Bavaria, many of these investments will again benefit the city and the Munich region.

6.1.3 Evaluation of the Cluster Initiative

With the cluster initiative, in several respects the technology policy of Bavaria has reached a turning point. It is quickly apparent that compared with the High-Tech Initiative, the funds provided are much smaller. The funds obtained from privatisation revenues have been used up, and a follow-up of the same level is no longer possible. For this reason, the cluster campaign now aims at mobilising private means. The support of large-scale projects has now been replaced by modest support of project ideas. For the first time, Bavaria is now also supporting on a large scale communication processes and dialogue approaches, which in the past had tended to be rejected in favour of subsidising investments and projects. Moreover, the approach originally worked out with the help of the management consultants Arthur D. Little, of concentrating on a few future-oriented areas and technology sectors has been watered down considerably. What has now emerged from it is an approach that uses the modern term ‘cluster campaign’, but rather sets its sights on wide-ranging technological fields and industry sectors, in order to serve as many target groups and parts of Bavaria as possible. Criticism is also levelled at the concept of communication policy itself. Up to now, the events and circles of co-operation have been aimed mainly at the management elites from enterprises, business associations and research institutions. The interests and the potential of the employees, and the representation of their interests as well as other socially relevant groupings, have hitherto not been taken into account in the cluster campaign (Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology, 2006d). However, since the quality of the labour market, working conditions, the supply of labour but also the cultural environment and regional quality of life are significant features of the success of clusters, important areas have been ignored up to now. Furthermore, the cluster campaign is characterised by a further conceptual contradiction. Clusters are constructs of economic space, which assume an agglomeration of enterprises along a value-added chain in a limited spatial environment. The cluster campaign run by the Bavarian government on the other hand is aimed at the whole of Bavaria as its backdrop. This makes developing an actual strategy for promoting spatial clusters very difficult (Invest in Bayern, 2007b).

6.2 Policies of the City of Munich

Compared with the state of Bavaria, the activities of Munich as its capital city appear modest – particularly as the city does not have the same financial means as the state of Bavaria. But there are some measures taken by the City of Munich, especially by the Department of Labour and Economic Development, to promote a knowledge-based economy. The measures essentially focus on supporting start-ups and enterprise networks, as well as providing space or buildings.

6.2.1 Policies to support start-ups and theme-specific orientation in the designation of new commercial spaces

One example for sector-specific innovation support is the Munich technology centre (MTZ, *Münchner Technologiezentrum*), which was founded in 1983 by the city of Munich and the chamber of industry and commerce. It offers office space for start-ups at below-market rents and administrative services such as telecommunications and office management. The companies are also helped to build their client network, to get access to finance, or to market their products at trade exhibitions. Another example for improving the knowledge base in Munich is the MEB (*Münchner Existenzgründungsberatung*), a consultancy office for start-ups, organised by the City of Munich with the chamber of industry and commerce (LH München, 2002b). Moreover, the city is also developing a life science park in Freiham in the western part of the city, as well as a park especially for media. These examples can be seen as prototypical for the city of Munich's policy on commercial space: in the new development of commercial areas, increasingly a thematic focus is being operated, through a selective policy of the establishment of enterprises from specific branches of industry, so that specific theme parks arise. Thus for example when the business park in the Riem Trade Fair City was set up, a policy of establishing new technology companies oriented with an affinity to trade fairs was operated. At the same time, economic and spatial objectives are being formulated for the new business park, which are anchored in the Munich city development plan, the 'Munich Perspective', under the guideline of 'creating and promoting jobs and economic prosperity'. Socially, it means the establishment of job opportunities for specific groups (especially part-time jobs) in the Riem Trade Fair City, forming the basis for linking the family and work-related sides of life. Spatially, it means the intermeshing of living and working space is an overarching planning goal for the Trade Fair City (LH München, 2006h).

6.2.2 Policies relating to developing Munich into a creative knowledge city

Currently, the importance of positioning Munich as a knowledge-based city is slowly being recognised by the responsible players, especially by the Department of Labour and Economic Development. Although the city of Munich has not yet formulated a comprehensive strategy concerning development into a creative knowledge-based city, one can observe certain elements of activity in building a cohesive approach, e.g.

- ***Studies and research commissions***

For some years, the department for work and the economy (*Referat für Arbeit und Wirtschaft*) has been placing commissions for studies and research with external expert consultancies as well as with university institutions, which analyse the branches of industry based in Munich and the region. Investigations thus appear regularly on the media economy, the I&T technologies, biotechnology and the pharmaceutical industry, as well as on medical technology. The department also continually publishes trade information, for example on aviation and astronautics, nanotechnology, the automobile economy etc. (see publications of the City of Munich under <http://www.muenchen.de/Wirtschaft/raw/152768/index.html>, accessed 13. March 2007).

The report 'Munich – City of Knowledge' (2002) and its follow-up study of the same name (2005) are concerned with Munich's knowledge-related activities and strategies, and they also describe the enormous strength and variety of the city's knowledge base. These studies relate to the profiling of Munich as a City of Knowledge in the form of an atlas. They show thematic maps relating to knowledge-intensive and trendsetting industries such as IT and biotechnologies, and relating to Munich as a location for research and development in universities and enterprises (LH München, 2002b; Hafner, Schier & von Streit, 2005).

The question of what importance creativity and knowledge have for the competitiveness of the Munich city region is currently being investigated on behalf of the Department of Labour and Economic Development, in the study 'location factor creativity'. The Social and Economic Geography department of LMU is critically evaluating Richard Florida's approach of the 3Ts (Technology, Talents and Tolerance) to German conditions, and is subjecting Munich to a creativity ranking in comparison with other German metropolitan regions. This study also investigates the location requirements and location ties of highly qualified employees and transnational migrants, as well as the cultural economy of the city of working people.

- ***Action plan for Munich as a city of knowledge***

In addition to the analysis of the development conditions of knowledge-intensive and creativity-oriented sectors, and the investigation into the attractiveness of Munich to knowledge workers, the city has drafted an action plan for how the city of Munich would like to make Munich into a city of knowledge. In this action plan (see Hafner, Schier, von Streit 2005), the city has formulated several fields of activity which should be given priority in the next few years:

- 'To strengthen the knowledge base', especially in the fields of adult education and schooling. Munich has for example a 'school and science network' which has the aim of giving school classes hands-on experience of scientific institutes and laboratories (Hafner, Schier, von Streit 2005, p. 52).
- To support the 'application of knowledge': mostly through the existing consultancies for start-up entrepreneurs, and the technology centre (MTZ).
- 'Support growth industries' through the provision of suitable sites.
- 'Attract and retain talented people': The city wants to strengthen its image as a university city (Hafner, Schier, von Streit 2005, p. 52).
- 'To strengthen the organisational capacity of the region': With regard to the so-called organisational capacity, there are some efforts being made to enhance the contact between the city, the universities and research institutes and business. Up to now, this

takes place in the form of a round table once a year, and is initiated and managed by the city's department of Labour and Economic Development (Hafner, Schier, von Streit 2005, p. 52).

Currently, it is planned to integrate 'knowledge' into the strategic development plan 'Munich Perspective' (*Perspektive München*); it would become something like a guiding principle and a significant field of strategic action for the city of Munich (LH München, 2005f).

The necessity of formulating strategic action concepts for the development of Munich as a city of knowledge is essentially being taken on by the Department for Labour and Economic Development. However, a coherent implementation strategy still lies a good way off, not least because the political leadership of the city of Munich sees hardly any need for action in this area. The pressure to act is regarded as slight, as the outline conditions for economic prosperity and the future prospects of the city are essentially judged to be positive (LH München, 2007). Numerous expert opinions indicate some problem areas, however.

6.3 Challenges for Munich's competitiveness

The next part will be concerned firstly with central general challenges to the Munich growth model, and secondly with challenges for the cultural knowledge industries.

6.3.1 General Challenges

The strong competitive position and the positive prognoses (Prognos, 2006) cannot however disguise the fact that the task of maintaining the front-runner position, and building on it in a lasting way, represents a great challenge for regional development policy in the Munich region (Miosga, 2007).

The insolvencies and crisis phenomena of the last few years experienced by large enterprises in key areas of the service sector, such as banks, the insurance industry, the media and information technology, or by the manufacturing sector (aeronautics and aerospace), indicate that even the economy in the Munich region is not invulnerable. For the Munich region, organising the complex outline conditions for developing the knowledge-based economy will therefore become a central challenge. The above-average high export quota of the regional economy points towards intensive integration into global markets, and thus towards a high level of competitive pressure. This means that they will have to fight even harder for their leading position in the fields of innovation and technological development.

At present, various analyses confirm deficits and a need for co-ordination for the Munich region:

- The SWOT analysis produced within the framework of the competition contribution to 'Future City 2030' for the Munich region refers on the one hand to a lack of integration within and between the clusters, and on the other hand an inadequately developed knowledge transfer between universities/research and the economy is confirmed. Active cluster management is therefore one of the central tasks in order to strengthen the competitiveness of the metropolitan region.

- In the area of quality of housing and quality of life in the region, increasing over-development and a dispersed environmental burden (noise, exhaust fumes from road traffic) have come to represent a growing detriment.
- The increasing traffic associated with work, the economy and leisure that is being produced on account of the increasingly dispersed settlement structures have become a burden. In places, the transport systems have become overloaded, meaning that accessibility becomes worse. There is also a need for action to extend and complete the transport infrastructure and provision both in public transport and in road traffic, as well as in the area of logistics and commercial traffic.
- The detrimental consequences of agglomeration also include the overall high costs of living in the region. Although the purchasing power per capita is above average, those on lower salaries, for example civil servants and public sector workers (middle and lower grades), or those employed in the area of personal services, reach the limits of their financial capabilities in the region.
- Particularly from the perspective of the capital of the Land, time and again there are calls for regional equalisation of the uneven distribution of burdens between the city and surrounding areas. Solution approaches such as regional equalisation funds or resources for regional projects have been discussed repeatedly, without even remotely approaching realisation.
- The lasting financial constraints imposed on local authorities have now affected even local authorities in better-off areas. It must be assumed that the local authorities are subject to a considerable need to make savings and pressure to rationalise.

In conclusion, it can be stated that in spite of a good starting position at present, securing the competitive position of the Munich region in any lasting way, particularly against the background of intensifying competitive struggle, has become an intensive challenge to the main players in the region. In view of the heavily fluctuating outline conditions, a policy of carrying on in the same way appears to be inappropriate. Even securing today's very high level of competitiveness requires a high degree of politically-supported structural change (Sternberg, 1998) and the determined formulation of political strategies for shaping the competitiveness of the Munich city region.

6.3.2 Challenges concerning the cultural knowledge industries

Most of the following deficits and themes came up in discussion with local experts in Munich, whilst some are also derived from an analysis of the literature.

- ***Lack of governance and co-operation between the different actors***

The increasing outplacement and relocation even of higher-value functions of the knowledge-based economy into the region leads to a patchwork-like location system with a dispersed structure, which is intensively integrated and inter-dependent beyond local authority boundaries, and which is faced with individualistic political decision-making structures in local government. Through the structural change towards the regional location network with significant commercial settlements that are scattered over the surrounding area, the capital city of the Land is gradually losing opportunities for shaping economic policy. In numerous

local authorities, isolated development strategies are brought to bear. The sum total of individual decisions driven by instances of local egoism is very likely not to automatically increase the overall benefit to the region. Instead of co-operating, the city and the municipalities compete for knowledge intensive institutions. One example is the exodus of university institutes. It is predominantly the sciences that have left the city; the humanities and social sciences of the University of Munich have so far resisted the trend to move outside. For almost two decades the city council has not reacted to this trend towards decentralisation in the universities. Now it is being realised that if this trend goes on Munich might lose its student atmosphere and urban character and – even more importantly – its creative potential. The city would thus like to stop the trend, although it must be said that the city has no real power to intervene. This ‘lack of governance’ (Sir Peter Hall) in the sense of under-developed co-operation and co-ordination of the individual decision-making processes, and of a lack of a regional model for development, could become a disadvantage in the development of the region.

The same lack of co-operation can be noted for the city and the state of Bavaria: although Bavaria is a key player and its policies have a huge impact on the region of Munich, there exists virtually no co-operation between the state of Bavaria and the city of Munich in this respect, and there are no moves to co-ordinate the different sets of activities.

Regarding co-operation between the different players, it can be argued that the institutional forms of governance have not kept pace with the economic and social developments. There is no co-operation and no strategic vision as to what direction local economic development in the Munich region as a whole should take. This lack of co-ordination of interests and activities between the different administrative levels is a key challenge for the further development of the competitiveness of the Munich region.

- ***High cost of living***

Another major theme is the high rent levels and the high costs of living and housing. This is a negative point especially for employees and artists working in the cultural industries whose earnings are low. Due to the high rent levels, and as there are no sites available for experimentation, the conditions for artists to set up their businesses are rather poor in Munich. Nor does Munich have an image of being an especially creative or thriving city for sub-cultures. Another point that also relates to the high costs of living also seems to be of major importance: if Munich wants to attract more highly qualified workers the city must make sure that it is possible to combine family life with a job, and expand childcare facilities as well as attractive housing for families.

- ***Lack of artistic creativity***

As numbers of patents and the high numbers of people working in R&D show, Munich is very strong in respect of technical creativity, whereas it seems to be less strong in the area of artistic creativity (although it must be stated that Munich has an outstanding ‘high culture’ sector, with the opera and various concert halls and museums of international standing). The open question here is whether one form of creativity can do without the other, or whether the city should become more active in improving its image for the creative industries.

To sum up, the state of Bavaria and the city of Munich together deploy a great variety of policies to improve competitiveness in the Munich region. Concerning the financial scope the

possibilities of the state of Bavaria are much bigger to finance programmes that are directed at improving entrepreneurship, commercialising knowledge and creating networks of innovation than the city of Munich.

In the 1950s and 1960s the Munich region strongly profited from the promotion of the armaments industry through the award of public sector contracts. From the 1980s up to the present, the conservative government of Bavaria (CSU) has set up several programmes for targeted support of innovation and technology: the money is spent on R&D, training, infrastructure, support for start-ups and technology transfer to make Bavaria an attractive location for the high tech industry. Although most of the efforts of the State were directed at the entire territory of Bavaria, many of the investments have benefited the Munich region. In 2006 the cluster campaign has been implemented to support state-wide networks interlinking business and scientific potential in 19 defined clusters. Compared to former programmes the funds of the cluster campaign are much smaller as the funds obtained from privatisation revenues have been used up. Measures taken by the City of Munich focus on placing commissions for studies and research which analyse the branches of industry based in the Munich region, on supporting start-up and enterprise networks as well as providing space for buildings. In comparison to other German cities like for example Berlin the small businesses of the cultural industry sector has so far received very little attention by the Bavarian State as well as by the city of Munich.

However, there must be stated a lack of governance and co-operation between the state actors and the city of Munich: there exists virtually no co-operation between the two actors and no strategic vision as to what direction the local economic development in the Munich region as a whole should take.

7 SYNTHESIS: PRELIMINARY RESULTS OF THE MUNICH RESEARCH

In the last chapter, we want to draw a preliminary conclusion from our research at its present stage, resulting from a review of the literature, two workshops with local experts, and interviews with experts of the knowledge intensive industries. This conclusion will be reached with special reference to the concept of path dependency, the cluster concept and soft location factors.

The *concept of path dependency*, which suggests that current development of regions and also the choices of technologies, products and location made by firms are heavily influenced by the cumulative effect of previous development, seems to be helpful in explaining the comfortable situation of Munich today in relation to the following aspects: Munich was the residence of the Bavarian king and royal family and therefore profited heavily until the 20th century from the high levels of investment in the arts, architecture and the sciences.

The 19th-century tradition of science-oriented industry continues to thrive in the high-tech metropolis of the 21st century, as the favourable influence of the Bavarian kings' patronage of the arts and sciences created the conditions for the development of quality industries which capitalised on the new technologies and inventions (e.g. the media, technical instrumentation).

Munich's political role as the state capital of Bavaria and its central function for the whole of Bavaria has up to the present enhanced theatre and other cultural institutions, architecture and a broad range of training facilities.

The 'mercy of late industrialisation' spared the city the difficult task of dealing with the structural economic change that typically appeared in other areas with economic emphasis on industrial branches such as coal mining, steel production, or shipbuilding. The relocation of headquarters to Munich: Siemens for example made a major contribution to economic reconstruction after World War II, and had a decisive influence on the course of the economy.

Munich's economy, especially in the field of micro-electronics, profited heavily from national and Bavarian technology policy. An important impetus in this respect came from the Federal defence department in the 1950s and 1960s.

Munich has primarily been a commercial city rather than a heavily industrialised one: the strong bourgeoisie supported entrepreneurship and the strong entrepreneurial spirit. Post-war migrants from the former German territories such as Silesia were a reservoir of well-educated workers.

With regard to path dependency, several factors have worked together: historical developments over a long period of time, such as the support for the arts provided by the Bavarian kings, as well as historical strokes of luck such as the relocation of Siemens from Berlin to Munich. In addition, political personalities such as Franz Joseph Strauss contributed to development with innovation and technology policies and massive financial support. Thus

the foundations were laid when governments were much more able to spend money than they are now, in times of budgetary crises. Also, the second wave of massive financial funding in the last ten years must be regarded as a singular event, as there are no more state-owned companies left that could be privatised. The question here is whether sustainable growth will develop.

With regard to the *cluster concept*, several high-tech clusters in different sectors can be identified in the region of Munich, especially in the fields of media, ICT and biotechnology. A contribution to the building of clusters is made by “institutional thickness” (Amin and Thrift 1994), made up by the numerous research institutions, financial services, venture capital companies, patent lawyers, consultancy and technology transfer associations and patenting advice. However, recent studies point to a lack of integration within and between the clusters in the Munich region, and it remains an open question as to whether clusters can be formed “artificially” or whether cluster management as it is applied in the cluster initiative of the state of Bavaria is an adequate tool for fostering collaboration between the members of a cluster. Furthermore, supporting existing clusters might also lead to inflexible structures and lock-ins. It might also have detrimental effects on innovations that cut across several technologies, sectors and value-added chains. Furthermore, the well-educated workforce of the Munich region is without doubt a positive factor in the development of clusters.

But this argument can also be turned around to the effect that clusters contribute to the highly diversified labour market: from the point of view of highly qualified workers, the Munich region offers a “thick” labour market with jobs adequate to their needs.

Munich’s ability to attract and retain highly qualified and creative people is also great due to the *soft location factors*. The city has a high quality of life, offering a broad mix of cultural and leisure opportunities close at hand, as it is very close to the Alps. Munich also offers plenty of cultural amenities, especially the formal “high culture” institutions such as concert halls, museums of modern art and theatres, which target elites and are well financed. The “cityscape” or architecture of the inner city also meets the needs of creative knowledge professionals. Munich therefore seems to offer the “look and feel” (Helbrecht, 2005) of cities that one segment of creative professionals is looking for. Munich seems to be especially attractive for people working in the cultural industries who are at a certain stage in their lives (often with children) and are equipped with a certain income.

Negative location factors for small and new businesses in the cultural industries are certainly the high living expenses and the fact that there are no cheap sites available for artistic experimentation. LOPs belonging to the cultural industries emphasised that Munich is missing a thriving urban atmosphere, which they would need as inspiration for their work. They described Munich as over-regulated and clean and saturated. Munich does not have the image of being a city where cultural trends are set.

Our research so far thus suggests that it is not so much openness and tolerance (the Florida argument) but amenities such as environmental beauty, the presence of cultural activities, and the attractiveness of the built environment that draw highly skilled people to Munich. Furthermore, it seems that factors such as age and family circumstances also play a decisive role.

With regard to creativity, we believe that several forms of creativity exist: Munich seems to be very strong in technical and economic creativity, which can be measured by the

number of patents, expenditure on R&D or people employed in R&D; it seems to be less strong in the artistic creativity that is needed to set new trends. An interesting question for our ongoing research is therefore whether one form of creativity needs the other, or whether sustainable economic success can be achieved only if both forms of creativity are available in a city. Or to use the words of one LOP member: Are artistic creativity and a thriving sub-culture the soil that creates the seed-bed in which technical creativity and innovations can grow?

Annex 1: Classification of economic activities (NACE and SIC)

Table Annex 1: Creative knowledge sectors – NACE classification

Sector	NACE codes
1. Creative industries	
Advertising	744 Advertising
Architecture	742 Architectural and engineering activities and related technical consultancy
Arts/antiques trade	Portions of the following sectors: 524 Other retail sale of new goods in specialized stores 525 Retail sales of second-hand goods in store
Crafts	No codes
Design	No codes
Designer fashion	Portion of the following sectors: 17 Manufacture of textiles 171 Preparation and spinning of textile fibres 172 Textile weaving 173 Finishing of textiles 174 Manufacture of made-up textile articles, except apparel 175 Manufacture of other textiles 176 Manufacture of knitted and crocheted fabrics 177 Manufacture of knitted and crocheted articles 18 Manufacture of wearing apparel; dressing and dyeing of fur 181 Manufacture of leather clothes 182 Manufacture of other wearing apparel and accessories 183 Dressing and dyeing of fur; manufacture of articles of fur 19 Tanning and dressing of leather; manufacture of luggage, handbags, saddlery, harness and footwear 191 Tanning and dressing of leather 192 Manufacture of luggage, handbags and the like, saddlery and harness 193 Manufacture of footwear
Video, film, music and photography	223 Reproduction of recorded media 921 Motion pictures and video activities 748 Miscellaneous business activities (*part of it)
Music and the visual and performing arts	Portions of the following sectors: 923 Other entertainment activities 927 Other recreational activities
Publishing	221 Publishing 924 News agency activities
Computer games, software, electronic publishing	722 Software consultancy and supply
Radio and TV	922 Radio and television activities
2. Information	<u>ICT manufacturing:</u>

<p>Communication Technology (adapted from OECD definition)</p>	<p>300 Manufacture of office machinery and computers 313 Manufacture of insulated wire and cable 321 Manufacture of electronic valves and tubes and other electronic components 322 Manufacture of television and radio transmitters and apparatus for line telephony and line telegraphy 323 Manufacture of television and radio receivers, sound or video recording or reproducing apparatus and associated goods 332 Manufacture of instruments and appliances for measuring, checking, testing, navigating and other purposes except industrial process control equipment 333 Manufacture of industrial process equipment</p> <p><u>ICT services</u> 642 Telecommunications 72 Computer related activities (minus 722 Software) 72.1: hardware consultancy; 72.3: data processing; 72.4: database activities; 72.5: maintenance and repair of office, accounting and computing machinery; 72.6: other computer related activities;</p>
<p>3. Finances</p>	<p><u>J. Financial intermediation</u> 65 Financial intermediation, except insurance and pension funding 66 Insurance and pension funding except compulsory social security 67 Activities auxiliary to financial intermediation</p>
<p>4. Law and other business services</p>	<p>741 Legal, accounting, book-keeping and auditing activities; tax consultancy, market research and public opinion polling, business and management consultancy. 743 Technical testing and analysis 745 Labour recruitment and provision of personnel 746 Investigation and security activities</p>
<p>5. R&D and higher education</p>	<p><u>73 Research and development</u> 731 Research and experimental development on natural sciences and engineering 732 Research and experimental development on social sciences and humanities 803 Higher education</p>

REFERENCES

- Adam, B. & J. Göddecke-Stellmann (2002). Metropolregionen - Konzepte, Definitionen und Herausforderungen, *Information zur Raumentwicklung*, No. 9, pp. 513-525. Bonn: BBR.
- Allensbach-Institut (2003). *Unternehmerfreundliche Großstadt - Bericht über eine Telefonumfrage unter mittelständischen Unternehmern in den 25 größten Städten Deutschlands (Studie im Auftrag der Bertelsmann Stiftung, der Zeitschrift Impuls und RWE)*. Allensbach: Allensbach Institut.
- Amin, A. & Thrift, N. (1994). Living in the Global. In: Amin, A. & Thrift, N. (eds.). *Globalization, Institutions and Regional Development in Europe*, pp. 1-22. Oxford University Press: Oxford.
- AOP (2007). Anwendungszentrum Oberpfaffenhofen, *Luft- und Raumfahrtstandort: Cluster für europäische Satellitennavigation* 2007, Gilching: <http://www.anwendungszentrum-gmbh.de/typo3/index.php?id=41>. Accessed 15 February 2007.
- Aring, J. (2001). *Postsuburbia - Herausforderungen für stadregionales Management*. Dokumentation einer Fachtagung der Arbeitsgemeinschaft der Regionalverbände in Ballungsräumen, ausgerichtet durch den Kommunalverband Großraum Hannover; die Tagung ist vom Bundesamt für Bauwesen und Raumordnung als dezentrales Ereignis der Weltkonferenz URBAN 21 anerkannt worden. Hannover: Kommunalverband Großraum Hannover.
- AUMA (2006). *Die Messewirtschaft - Bilanz 2005*. Berlin: Ausstellungs- und Messe-Ausschuss der Deutschen Wirtschaft e.V..
- Bade, F.-J. (2006). Evolution of Regional Employment in Germany: Forecast 2001 to 2010. In: Reggiani, A. & P. Nijkamp (eds.), *Spatial Dynamics, Networks and Modelling*, pp. 293-318. Cheltenham: Edward Elgar Publishing.
- Bade, F.-J., T. Mikeleit, M. Kiehl & G. Papanikolaou (2003). *Wirtschaftliche Aussichten der Regionen Deutschlands*. vhw, Forum Wohneigentum. 3, pp. 116-120. Berlin: vhw.
- Bald, D. (2003). *Die "Weiße Rose" - von der Front in den Widerstand*. Aufbau-Verlag: Berlin
- Bailey, G. (1980). *München*. Amsterdam: Time-Life.
- Bathelt, H., A. Malmberg & P. Maskell (2004). Clusters and knowledge - local buzz, global pipelines and the process of knowledge creation. In: *Progress in human geography*. 28, (1), pp. 31-56. Sage Publications.
- Bauer, R. (1993). *München. Die Geschichte einer Stadt*. Piper: München.
- Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology (2005a). *Wirtschaftsstandort Bayern. Kraftzentrum in der Mitte Europas*. September 2005. München: Bayerisches Staatsministerium für Wirtschaft, Infrastruktur, Verkehr und Technologie.
- Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology (2005b). *Regierungsprofil Oberbayern*. Staatsministerium für Wirtschaft, Infrastruktur, Verkehr und Technologie. München Referat IiB.

- Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology (2006a). *Daten zur Wirtschaftsentwicklung in Bayern 2005 im Vergleich zum Bundesgebiet und zu den Ländern*. February 2006. München: Bayerisches Staatsministerium für Wirtschaft, Infrastruktur, Verkehr und Technologie.
- Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology (2006b). *Operationelles Programm des EFRE im Ziel „Regionale Wettbewerbsfähigkeit und Beschäftigung“ Bayern 2007-2013 Programmdokument zur EU-Strukturfondsförderung*. München: Bayerisches Staatsministerium für Wirtschaft, Infrastruktur, Verkehr und Technologie.
- Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology (2006c). *Allianz Bayern Innovativ: Eckpunkte bayerischer Clusterpolitik*. November 2006. München: Bayerisches Staatsministerium für Wirtschaft, Infrastruktur, Verkehr und Technologie.
- Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology (2006d). *Bayerische Clusterpolitik*, February 2006. München: Bayerisches Staatsministerium für Wirtschaft, Infrastruktur, Verkehr und Technologie.
- Bavarian Ministry of Economic Affairs, Infrastructure, Transport and Technology (2007). *Bevölkerungsentwicklung 1995-2005 in Bayern*. München: Bayerisches Staatsministerium für Wirtschaft, Infrastruktur, Verkehr und Technologie.
- Bavarian State Office for Statistics and Data Processing (2006). Bayerisches Landesamt für Statistik und Datenverarbeitung. *Daten für Bayern*. <http://www.statistik.bayern.de/english/impress/>. Accessed 5. January 2007.
- BAW (2004). *Institut für regionale Wirtschaftsforschung GmbH, Bremen*. <http://www.baw-bremen.de>. Accessed 10. December, 2006.
- Bayern International GmbH (eds.) (2005). *Key Technologies in Bavaria 2005*. CD-Rom. München.
- Bayerisches Landesamt für Statistik und Datenverarbeitung (2006a). *Regionaldaten*. Bayerisches Landesamt für Statistik und Datenverarbeitung. Statistisches Amt München. http://www.muenchen.info/sta/m-stat/themen/regionaldaten/jahreszahlen/jaz_regionaldaten_uebersicht.htm. Accessed 5 January 2007.
- Bayerisches Landesamt für Statistik und Datenverarbeitung (2006b). *Ausländer in Bayern - Stand 31. Dezember 2005*. München.
- Bayerische Staatskanzlei (2006a). *High-Tech-Offensive Bayern – Bilanz und Perspektiven*. München.
- Bayerische Staatskanzlei (2006b). *High-Tech-Offensive Bayern (version with table, only online)*, München. http://www.bayern.de/Politik/Initiativen/HTO_Bilanz/40_Saeule3.html. Accessed 2 February 2007.
- Berg, L. van den & Braun, E. & von Willem, W. (2001). *Growth clusters in European metropolitan cities - a comparative analysis of cluster dynamics in the cities of Amsterdam, Eindhoven, Helsinki, Leipzig, Lyons, Manchester, Munich, Rotterdam and Vienna*. Aldershot: Ashgate.
- Berg, L. van den & Pol, P.M.J. & Winden van, W. & Woets, P.(2005). Munich. In: Berg, L. van den & Pol, P.M.J. & Winden van, W. & Woets, P. (eds.). *European Cities in the Knowledge Economy. The cases of Amsterdam, Dortmund, Eindhoven, Helsinki, Manchester, Munich, Münster, Rotterdam and Zaragoza*. pp. 192-220. Ashgate: Rotterdam.
- BBR (2001). *Spatial Development and Spatial Planning in Germany*. Federal Office for Building and Regional Planning. Bonn: Bundesamt für Bauwesen und Raumordnung

- BBR (2005). *Raumordnungsbericht 2005*. Federal Office for Building and Regional Planning. Bonn: Bundesamt für Bauwesen und Raumordnung.
- Biehler, H. & Brake, K. & Ramschütz, E. (1994). Standort München. Sozioökonomische und räumliche Strukturen der Neo-Industrialisierung. Institut für Medienforschung und Urbanistik München. Studien (20). München: IMU-Institut.
- Biehler, H. (1999). *Regionale Netzwerke und regionaler Arbeitsmarkt: kumulative Prozesse zirkulärer Verursachung?*. Wirtschaftswissenschaftliche Fakultät, Nr. 100, München: IMU-Institut.
- Biehler, H., Genosko, J., Sargl, M. & Sträter, D. (2003). *Standort München – Medienwirtschaft und Fahrzeugbau*. Schüren: Marburg.
- Bio^M AG (2005). *Die Bio-Tech-Region München 2004*. Ein Cluster im Umbruch. München.
- Bio^M AG (2007). www.bio-m.de. Accessed 26. February 2007.
- Bismarck, B. v. & A. Koch (eds.) (2005). *beyond education. Kunst, Ausbildung, Arbeit und Ökonomie*. Leipzig, Revolver: Archiv für aktuelle Kunst.
- BMBF (2005). *Studie zur Situation der Medizintechnik in Deutschland im internationalen Vergleich*. Bonn, Berlin: HIS.
- BMBF (2006a). Bundesministerium für Bildung und Forschung. *Forschung und Innovation in Deutschland 2006*. Bonn, Berlin: HIS.
- BMBF (2006b). Bundesministerium für Bildung und Forschung. *Wir setzen die Hightech-Strategie um*, unter: <http://www.bmbf.de/de/6618.php>. Accessed 5 January 2007.
- BMBF (2006c). Bundesministerium für Bildung und Forschung. *Exzellenzinitiative*. <http://www.bmbf.de/de/655.php>. Accessed 5 January 2007.
- Bode, V. (2005). Der Luftkrieg gegen Leipzig In: Schmidt, H., G. Mayer, D. Wiktorin, S. Tzschschel & J. Blenck (eds.), *Der Leipzig Atlas*, pp. 52-53. Leipzig: Emos.
- Bryson, J. R. (2000). *Knowledge, space, economy*. London: Routledge.
- Burdack, J. (2005a). A place in the sun. Cooperation, competition and Leipzig's quest for a size of European importance. In: Giffinger, R. & H. Wimmer (eds.), *Competition between Cities in Central Europe: Opportunities and Risks of Cooperation*, pp. 136-147. ROAD: Hannover.
- Burdack, J. (eds.) (2005b). *Europäische metropolitane Peripherien*. Leipzig: Leibniz-Institut für Länderkunde.
- Bührer, W (2004). *Wirtschaftliche Entwicklung in der Bundesrepublik*. Information zur politischen Bildung (Heft 270), München: Franzis-Druck.
- BVA (2005). Bundesverwaltungsamt. *Administration of the Municipalities*. Bund Online www.bund.de. Accessed 15 January 2007.
- Castells, M. & Hall, P. (1994). *Techpoles of the World - the making of 21st century industrial complexes*. London, New York: Routledge.
- Cooke, Ph., Boekholt, P. & Tödtling, F. (2000): *The Governance of Innovation in Europe. Regional Perspectives on Global Competitiveness*. Pinter: London, New York.
- Cooke, P. (2002). *Knowledge Economies. Clusters, Learning and Cooperative Advantage*. London: Routledge.
- DCMS (1998). *A new cultural framework*. Department of Culture, Media, and Sport, London.
- Ehrensberger, W. (2004). *Luftfahrtstandort Bayern: Setzen auf Spin-offs*. IHK-München. Ihk-Magazin 10/2004, www.ihk-muenchen.de. Accessed 10 March 2007.
- Engelmann, S. (2005). Internationaler Handel und der Arbeitsmarkt Sachsens: Sind niedrig qualifizierte Beschäftigte die Verlierer im Globalisierungsprozess? *ifo Dresden berichtet*, 12, (4), pp. 11-17. Dresden: ifo Dresden.
- Federal Office of Administration (2007). Administration of the Federal States. Bundesverwaltungsamt (BVA), www.bund.de. Accessed 6. March 2007.

- Fesel, B.(ed.) (2007): Kultur und Kreativität als neue Wirtschaftsfaktoren. Jahrbuch Kulturwirtschaft 2006. Berlin.
- Florida, R. (2002). The rise of the creative class - and how it's transforming work, leisure, community and everyday life. New York: Basic Books.
- Florida, R. (2005a). *Cities and the creative class*. New York: Routledge.
- Florida, R. (2005b). *The flight of the creative class - the new global competition for talent*. New York: Harper Business.
- Franz, P. (2005). *Wirtschaftliche Rahmenbedingungen Leipzig*. Leipzig: Beitrag im Workshop der Rosa-Luxemburg-Stiftung Sachsen e.V. »Leipzig 2020: Europäische Metropole oder mitteldeutsche Provinzperle?. In: Leipzig, 11. Juni 2005.
- Fritsche, A. & Kreipl, A. (2003). Industriestadt München – Eine Nachkriegskarriere. In: Heinritz, G. & Wiegandt, C.-C.- & Wiktorin, D. (eds.). *Der München Atlas*. pp. 160-161. Italien: Emons.
- Gaebe, W. (1998). Industrie. In: Kulke, E. (eds.). *Wirtschaftsgeographie Deutschland*, pp. 87-156. Gotha: Justus Perthes Verlag.
- Gans, P. & Kemper, F.-J. (2001): Bevölkerung in Deutschland- eine Einführung. In: Institut für Länderkunde. pp. 12-15. Leipzig (eds.), *Nationalatlas Bundesrepublik Deutschland. Bevölkerung*. Berlin: Spektrum Akademischer Verlag Heidelberg.
- gate (2007). Garching Technologie- und Gründerzentrum GmbH. *Freiraum für Ideen*. München. <http://www.gategarching.de/index.html>. Accessed 2 March 2007.
- Geipel, R. & Heinritz, G. (eds.) (1987). *München- ein sozialgeographischer Exkursionsführer*. Münchener Geographische Hefte Nr. 55/56. Kallmünz: Lassleben.
- Glock, B. (2006). *Stadtpolitik in schrumpfenden Städten: Duisburg und Leipzig*. Wiesbaden: Vs.
- Gornig, M. & H. Häußermann (1998). Städte und Regionen im Süd-Nord und West-Ost-Gefälle. In: Wollmann, H. & R. Roth (eds.), *Kommunalpolitik. Politisches Handeln in Städten und Gemeinden*, pp. 338-360. Bonn: Bundeszentrale für politische Bildung.
- Greif, S. (2006) (eds.) *Patentatlas Deutschland. Regionaldaten der Erfindertätigkeit*. München: Deutsches Patent- und Markenamt.
- Grotz, R. & Schätzl, L. (eds.) (2001): *Regionale Innovationsnetzwerke im internationalen Vergleich*. LIT: Münster.
- Grundmann, L. (2005). Der Aufstieg der sächsischen Industriegroßstadt (1830-1918). In: Schmidt, H., G. Mayer, D. Wiktorin, S. Tzschaschel & J. Blenck (eds.), *Der Leipzig Atlas*, pp. 48-49. Leipzig, Emons.
- Hafner, S. & Miosga, M. (2001). INTERACT Munich's Case Study, Messestadt Riem, Trade Fair City. Department of Geography, Technical University of Munich.
- Hafner, S. (2003). Strategien zur Aufwertung von Stadtquartieren und zur Qualifizierung von benachteiligten Menschen : soziale Unternehmen in München, betrachtet aus einer konstruktivistischen Perspektive. Passau: LIS-Verlag.
- Hafner, S., Schier, M. & von Streit, A. (2005). *München – Stadt des Wissens*. Issue number 186, LH München (eds.), München.
- Hafner, S. & Miosga, M. (2007, forthcoming). Großprojekte im Spannungsfeld zwischen wettbewerbsorientierter Stadtentwicklungsstrategie, sozialer Integration und ökologischen Belangen. DISP.
- Häußermann, H. & Siebel, W. (1987). *Neue Urbanität*. Frankfurt/Main: Suhrkamp Verlag.
- Helbrecht, I. (2005). Geographisches Kapital - Das Fundament der kreativen Metropolis. In: Kujath, H.-J. (eds.), *Knoten im Netz*, pp.121-157. Münster: LIT Verlag.

- Heigl, P. & Schmitt, C. (2003) In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D. (eds.). *Der München Atlas*, pp. 40-41. Italien: Emons.
- Heinritz, G. (1987). Münchens Umlandbeziehungen. In: Geipel, R. & Heinritz, G. (eds.) (1987). *München- ein sozialgeographischer Exkursionsführer*. Münchener Geographische Hefte Nr. 55/56, pp. 141-164. Kallmünz: Lassleben.
- Herfert, G. (1996). Wohnsuburbanisierung in Verdichtungsräumen der neuen Bundesländer. Eine vergleichende Untersuchung im Umland von Leipzig und Schwerin. *Europa Regional*, 4, pp. 32-46. Leipzig.
- Herfert, G. (1998). Stadt-Umland-Wanderungen in den 90er Jahren. Quantitative und qualitative Strukturen in den alten und neuen Ländern. *Information zur Raumentwicklung*, 11/12, pp. 763-776. Bonn: BBR.
- Herfert, G. (2002). Beiträge - Disurbanisierung und Reurbanisierung. Polariserte Raumentwicklung in der ostdeutschen Schrumpfunglandschaft. *Raumforschung und Raumordnung*, 60, (5-6), pp. 334-344. Bonn: BBR.
- Herfert, G. & D. Röhl (2001). Leipzig – Region zwischen Boom und Leerstand. In: Brake, K., J. S. Dangschat & G. Herfert (eds.), *Suburbanisierung in Deutschland. Aktuelle Tendenzen. Leverkusen-Opladen*, pp. 151-162. Wiesbaden: Leske und Budrich.
- Hocquél, W. (1990). *Leipzig*. Leipzig: VEB E. A. Seemann Verlag Leipzig.
- Hoyler, M. (2004). *Räumlicher Strukturwandel im Zeitalter des Internets: Neue Herausforderungen für Raumordnung und Stadtentwicklung*. Wüstenrot Stiftung (eds). GaWC Research Bulletin 127, pp. 261-276. VS Verlag für Sozialwissenschaften: Wiesbaden.
- iBusiness Jahrbuch (2006). *Das Jahrbuch der interaktiven Medien*. München: Geiselberger.
- IHK-Stuttgart (2003). *Innovationsregion Stuttgart. Die Region Stuttgart als Wirtschaftsstandort im Vergleich zu anderen Metropolregionen in Deutschland*. Stuttgart: IHK.
- IMU (2002). *Raus aus der Stadt? Untersuchung der Motive von Fortzügen aus München in das Umland 1998 – 2000*. Kurzfassung, im Auftrag des Referats für Stadtplanung und Bauordnung, IMU-Institut für Medienforschung und Urbanistik. München: IMU.
- INSM (2006). *Großstadtvergleich - Deutsche Großstädte im Vergleich*. Studie der IW Consult GmbH im Auftrag der Initiative Neue Soziale Marktwirtschaft (INSM) und der Wirtschaftswoche. Köln: DIW.
- Israelitische Kultusgemeinde (eds.) (2004). *Das neue Gemeinde- und Kulturzentrum in der Mitte Münchens*. München.
- Invest in Bavaria (2005). *Stark überzeugend attraktiv. Der Standort Bayern*. Bayerisches Staatsministeriums für Wirtschaft, Infrastruktur, Verkehr und Technologie mit Bayern International. München: Mediengruppe Universal.
- Invest in Bayern (2007a). *Invest in Bayern*. <http://www.invest-in-bavaria.de>. Accessed 14. February 2007.
- Invest in Bayern (2007b). Bayerns Cluster. *Allianz Bayern Innovativ: Cluster-Offensive Bayern*. München.
- Institut für Länderkunde, Leipzig (1999). *Nationalatlas Bundesrepublik Deutschland*. Gesellschaft und Staat. Berlin: Spektrum Akademischer Verlag Heidelberg.
- Jackson, K. (1985). *Crabgrass Frontier. The suburbanization of the United States*. New York, Oxford: Oxford University Press.
- Jancius, A. (2006). *Unemployment, Deindustrialization, and "Community Economy" in Eastern Germany*. *Ethnos*, 71, (2), pp. 191-212. London: Routledge.
- Kabisch, S. (1994). Entwicklungsperspektiven gründerzeitlicher Stadtgebiete. In: Breuste, J. (eds.), *Stadtökologie und Stadtentwicklung: Das Beispiel Leipzig*, pp. 99-110. Berlin.

- Kagermeier, A. & Miosga, M. & Schußmann, K. (2001). Die Region München – Auf dem Weg zu regionalen Patchworkstrukturen. In: Brake, K. & Dangschat, J. S. & Herfert, G. (eds.). *Suburbanisierung in Deutschland. Aktuelle Tendenzen*. pp. 163-174. Opladen: Leske+Budrich.
- Kaiser, P. (2005). Subversive Rekursphänomene. Künstlerische Selbstorganisation in der DDR am Beispiel In: Bismarck, B. v. (eds.), *beyond education*, pp. 33-47. Leipzig: Revolver - Archiv für aktuelle Kunst.
- Klingbeil, D. (1987a). Grundzüge der stadtstrukturellen Entwicklung nach dem II. Weltkrieg. In: Geipel, R. & Heinritz, G. (eds.). *München- ein sozialgeographischer Exkursionsführer*. Münchener Geographische Hefte Nr. 55/56, pp. 101-140. Kallmünz: Lassleben.
- Klingbeil, D. (1987b). Münchens Wirtschafts- und Bevölkerungsentwicklung nach dem II. Weltkrieg. In: Geipel, R. & Heinritz, G. (eds.). *München- ein sozialgeographischer Exkursionsführer*. Münchener Geographische Hefte Nr. 55/56, pp. 43-67. Kallmünz: Lassleben.
- Knieling, J. & S. Rahlf (2005). *Metropolregion Halle/Leipzig - Handlungskonzept*. Dresden: KORIS - Hannover.
- Kuhn, W. (2003a): Gründung und Mittelalter. In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D. (eds.). *Der München Atlas*, pp. 26-27. Italien: Emons.
- Kuhn, W. (2003b): Von der Jahrhundertwende bis zum Zweiten Weltkrieg. In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D. (eds.). *Der München Atlas*, pp. 32-33. Italien: Emons.
- Krätke, S. (2007). *Metropolisation of the European Economic Territory as a Consequence of Increasing Specialisation of Urban Agglomerations in the Knowledge Economy*. In: *European Planning Studies*, 15 (1), pp. 1-27. London.
- Krau, I. (2003). Zukunft München - Die Region ist die Stadt. In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D. (eds.). *Der München Atlas*, pp. 74-75. Italien: Emons.
- Kujath, H.-J. (2005). Wissensintensive Wirtschaftsaktivitäten im Regionalsystem der Bundesrepublik Deutschland: Clusterpotenziale und Beitrag zur regionalen Wirtschaftsleistung. In: Kujath, H.-J. (eds.), *Knoten im Netz*, pp. 23-64. Münster: LIT Verlag.
- Ossenbrügge, J. (2001). Regionale Innovationssysteme: Evolution und Steuerung geographischer Formen der wissensbasierten Wirtschaft. In: R. Schwinges, P. Messerli ed al. (eds.), *Innovationsräume - Woher das Neue kommt in Vergangenheit und Gegenwart*, pp. 85-102. Akademische Kommission Universität Bern:Zürich.
- Laufer, H. & Münch, U. (1997). *Das föderative System der Bundesrepublik Deutschland*. München: Bayerische Landeszentrale für politische Bildungsarbeit.
- Laux, H.-D. (2001a). Bevölkerungsverteilung. In: Institut für Länderkunde, pp. 32-35. Leipzig (eds.), *Nationalatlas Bundesrepublik Deutschland. Bevölkerung*. Heidelberg: Spektrum Akademischer Verlag.
- Laux, H.-D. (2001b). Bevölkerungsentwicklung. In: Institut für Länderkunde. pp. 36-39. Leipzig (eds.), *Nationalatlas Bundesrepublik Deutschland. Bevölkerung*. Heidelberg: Spektrum Akademischer Verlag.
- LH München (2000a). *Bevölkerung*. http://www.muenchen.info/sta/m-stat/themen/bevoelkerung/grafiken_karten/jahreszahlen_2000/jg010102.pdf. Accessed 24.2.200
- LH München (2000b). *Jahreswirtschaftsbericht München 2000*. Landeshauptstadt München, Referat für Arbeit und Wirtschaft. München.

- LH München (2002a). *Münchner Armutsbericht 2000*. Sozialreferat Landeshauptstadt München. München.
- LH München (2002b). *München - Stadt des Wissens*. Referat für Arbeit und Wirtschaft. München.
- LH München (2004a). *München wie geplant. Die Entwicklung der Stadt 1158 bis 2008*. Referat für Stadtplanung und Bauordnung. München: Bayerisches Landesvermessungsamt München.
- LH München (2004b). *Wachstumsmarkt Medizintechnik*. Referat für Arbeit und Wirtschaft & Referat für Gesundheit und Umwelt, München.
- LH München (2005a). *Jahreswirtschaftsbericht München 2005*. Landeshauptstadt München, Referat für Arbeit und Wirtschaft. München.
- LH München (2005b). *München sozial 1994-2003*. Sozialreferat München. München.
- LH München (2005c). *München - Die Biotechnologie-Region Deutschlands. Brancheninfo*. Referat für Arbeit und Wirtschaft. München.
- LH München (2005d). *Die Umweltwirtschaft in der Region München*. Referat für Arbeit und Wirtschaft. München.
- LH München (2005e). *Luft- und Raumfahrt in München*, Brancheninfo. Aug. 2005, München.
- LH München (2005f). *Perspektive München - Münchens Zukunft gestalten*. Bericht zur Stadtentwicklung 2005. München.
- LH München (2006a). *Münchner Armutsbericht - Fortschreibung 2004*. Sozialreferat Landeshauptstadt München. München.
- LH München (2006b). *München. Der Wirtschaftsstandort. Fakten und Zahlen*. Referat für Arbeit und Wirtschaft, Heft 193. München.
- LH München (2006c). *Münchner Armutsbericht - Fortschreibung 2004*. Sozialreferat, Februar 2006, München.
- LH München (2006d). *Bericht zur Wohnunsituation in München 2004-2005*. Referat für Stadtplanung und Bauordnung. München.
- LH München (2006e). *Munich under the sign of the rainbow*. Referat für Wirtschaft und Arbeit. www.muenchen.de. Accessed 2 February 2007.
- LH München (2006f). *Jahresbericht des Tourismusamtes 2005*. Tourismusamt. Referat für Arbeit und Wirtschaft, München.
- LH München (2006g). *München Modell*. Referat für Stadtplanung und Bauordnung. München.
- LH München (2006h). *Assessment of Messestadt Riem. Sustainable urban development in Munich*. Department of urban planning. München.
- LH München (2007). *Unser Leitbild*. Referat für Arbeit und Wirtschaft. Landeshauptstadt München. München.
- LH München & IHK (2003). *Der Medienstandort München*. Referat für Arbeit und Wirtschaft. Ortman-Team: München.
- LH München & IHK (2004). *Studie Informations- und Kommunikationsstandort München*. 2nd edition. Ortman-Team: München.
- M-Statistik (2006). *M-Statistik online*. Landeshauptstadt München, unter: <http://www.muenchen.info/sta/m-stat/>. Accessed 26 February 2007.
- Lütke-Daldrup, E. (2004a). Die perforierte Stadt. Eine Versuchsanordnung. *Bauwelt*, 24, 40-42. Berlin.
- Lütke-Daldrup, E. (eds.) (2004b). *Plus Minus Leipzig 2030: Stadt in Transformation*. Wuppertal: Müller und Busmann.

- Matthiesen, U. (eds.) (2004). *Stadtregion und Wissen. Analysen und Plädoyers für eine wissensbasierte Stadtpolitik*. VS Verlag für Sozialwissenschaften: Wiesbaden.
- Matthiesen, U. (2005a). Governance Milieus in Shrinking Post-Socialist City Regions – and their Respective Forms of Creativity. *DISP*, 162, 53-61.
- Matthiesen, U. (2005b). *Knowledge Scapes*. Erkner: IRS.
- Metzler, D. & Zademach, H.-M. (2003). Münchner Bodenpreise in steilen Höhen. In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D. (eds.). *Der München Atlas*, pp.48-49. Italien: Emons.
- Meusberger, P. (2000). The Spatial Concentration of Knowledge: Some Theoretical Considerations. *Erdkunde*, 54, pp. 352-364.
- Miosga, M. (2003). Konkurrenz und Kooperation - München und sein Umland. In: Heinritz, G. & Wiegandt, C.-C.- & Wiktorin, D. (eds.). *Der München Atlas*. pp.72-73. Italien: Emons.
- Miosga, M. (2005). Munich's city-cooperation between image-building and learning processes. In: Giffinger, R. (eds.), *Competition between Cities in Central Europe: Opportunities and Risks of Cooperation*. Hannover: ROAD.
- Miosga, M. (2007 forthcoming). Metropolregionen als Instrument der Raumentwicklung. In: Akademie für Raumforschung und Landesplanung (ARL) (eds.). *Innovative Konzepte auf dem Weg zur Metropolregion München*. Bericht der Arbeitsgruppe der Landesarbeitsgemeinschaft Bayern.
- Nöhlbauer, H. F. (1982). *München. Eine Geschichte der Stadt und ihrer Bürger*. Süddeutscher Verlag: München.
- Nöhlbauer, H. F. (1993). *München*. Hirmer Verlag: München.
- Popien, R. (2003): Bunt wie der Regenbogen – Die schwul-lesbische Szene in München. In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D.: *Der München Atlas*, pp. 188-189. Italy: Emons.
- OECD (eds.) (1999). *Boosting Innovation: The Cluster Approach*. Paris: OECD.
- Oechsel, M. & Beck, L. & Job, H. (2003). Frankfurt auf den Fersen- Der Münchner Flughafen. In: Heinritz, G. & Wiegandt, C.-C.- & Wiktorin, D. (eds.) *Der München Atlas*. pp.78-79. Italien: Emons.
- Ott, T. (2000). Angleichung, nachholende Modernisierung oder eigener Weg? Beiträge der Modernisierungstheorie zur Transformationsforschung. *Europa Regional*, 8, pp. 20-27. Leipzig.
- Popp, M. & Wiegandt, C.-C. (2003). Mieten in München - Man leistet sich ja sonst nichts. In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D. (eds.). *Der München Atlas*, pp. 178-179. Italien: Emons.
- Porter, M.E. (2001). Regions and the New Economics of Competition. In: Scott, A.J. (eds.) *Global City-Regions. Trends, Theory, Policy*, pp. 139-157. Oxford: Oxford University Press.
- Prognos (2002). *Technologieatlas 2002*. Basel: Prognos.
- Prognos (2006). *Atlas of the Future. Zukunftsatlas 2006. Branchen im Fokus – Wer verfügt über Kompetenzen und Clusterpotenziale?*. Basel: Prognos.
- PV (2006). *Regionsdaten 2005*. Region München. Planungsverband Äußerer Wirtschaftsraum München. München.
- Regierung Oberbayern (2007). *Oberbayern im Überblick*. <http://www.regierung.oberbayern.bayern.de/>. Accessed 21. February 2007.
- Regionaler Planungsverband München (2006). *Die Region München*. <http://www.region-muenchen.com/region/region.htm>. Accessed 15. December 2006.

- Rehfeld, D. (1999). *Produktionscluster, Konzeption, Analysen und Strategien für eine Neuorientierung der regionalen Strukturpolitik*. München.
- Reiß-Schmidt, S. (2003). Wo die Zukunft Stadt findet - Stadtumbau und große Projekte. In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D. (eds). *Der München Atlas*, pp. 68-71. Italien: Emons.
- Sargl, M. (2003). Regionale Netzwerke bei der Filmproduktion in München. Berlin: Wissenschaftlicher Verlag.
- Schätzl, L. (2002). *Technological change and regional development in Europe*. Physica-Verlag: Heidelberg, New York.
- Schavan, A. (2006). *Hightech-Strategie der Bundesregierung - Neue Grundlage für Deutschlands Innovationspolitik*, 21. September 2006, unter: http://www.hightechstrategie.de/_media/mr_20060921.pdf. Accessed 5. January 2007.
- Scheller, H. (2005). Der sozialistische Wohnungsbau bis 1989. In: Schmidt, H., G. Mayer, D. Wiktorin, S. Tzschaschel & J. Blenck (eds.), *Der Leipzig Atlas*, pp. 55-55. Leipzig, Emons.
- Schier, M. (2003). Münchener Mode geht in die Welt. In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D. (eds.). *Der München Atlas*, pp. 168-169. Italien: Emons.
- Schmid-Urban, P. (2003). Armut und Reichtum in München. In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D. (eds.). *Der München Atlas*, pp. 180-181. Italien: Emons.
- Sinz, M. & Schmidt-Seiwert, V. (2003). München - Eine europäische Metropole. In: Heinritz, G. & Wiegandt, C.-C.- & Wiktorin, D. (eds.). *Der München Atlas*, pp. 10-12. Italien: Emons.
- Schönert, M. (2004). Zur Lage der Medienwirtschaft in den deutschen Großstädten 2003. *Monatsberichte des Instituts für Wirtschaftsforschung GmbH*, Heft 5, pp. 1-12. Bremen.
- Schönert, M. & W. Willms (2001). Medienwirtschaft in regionalen Entwicklungsstrategien. Eine Standortdiskussion aus der Perspektive der 20 größten deutschen Städte. *Raumforschung und Raumordnung*, 59, (5-6). pp. 412-426. Bonn: BBR.
- Schröder, F. (2003). Die Zerstörung Münchens im zweiten Weltkrieg. In: Heinritz, G., Wiegandt, C.-C. & Wiktorin, D. (eds.). *Der München Atlas*, pp. 38-39. Italien: Emons.
- Schüle, C. (2005). Die stille Revolte. *Die Zeit*, pp. (Issue Date 21.07.2005), Hamburg.
- Seufert, W. (2002). Film- und Fernsehmarkt in Deutschland 2000/2001. In: Landesmedienanstalten (eds.), *Schriftenreihe der Landesmedienanstalten*, vol. 26, Berlin.
- Simmie, J. & W. Lever (2002). Introduction: The Knowledge-based City. *Urban Studies*, 39 (5-6), pp. 855-858. Berlin: DIFU.
- Söndermann, M. (2007), Kulturwirtschaft und Kreativwirtschaft. eine Neue Diskussion für Deutschland. In: Fesel, B.(ed.). *Kultur und Kreativität als neue Wirtschaftsfaktoren. Jahrbuch Kulturwirtschaft 2006*, pp. 8-20. Berlin.
- Software Initiative Bayern (2006), *Focus of Bavaria's Software Initiative*, München.
- Software Initiative Bayern (2007). *Munich Business Angel Network*. <http://www.software-offensive-bayern.de/R/000099.xml>. Accessed 18. February 2007.
- Software Forum Bayern (2003). *Software Standort Bayern*. Software Forum Bayern e.V. - Ein Bericht des Wissenschaftlich-Technischen Beirats der Bayerischen Staatsregierung. München.
- Staatsministerium (2003). *Landesentwicklungsplan Sachsen 2003*. Dresden: Staatsministerium des Inneren.
- Statistisches Bundesamt (2006). *Statistische Ämter des Bundes und der Länder*. <http://www.statistik-portal.de/Statistik-Portal/>. Accessed 20. December 2006.

- Statistical Office Munich (2007). Statistisches Amt der Landeshauptstadt München. München.
- Sternberg, Rolf (1995). *Technologiepolitik und High-Tech-Regionen - ein internationaler Vergleich*. Wirtschaftsgeographie, Bd. 7. LIT: Münster, Hamburg.
- Sternberg, R. (1998). München und Voralpen. In: Kulke, E. (eds.). *Wirtschaftsgeographie Deutschland*, pp. 523-552. Gotha und Stuttgart: Klett-Perthes.
- Sternberg, R. (1999). *Innovative Netzwerke und Regionalentwicklung*. In: ARL (eds.), Europäische Einflüsse auf die Raum- und Regionalentwicklung, pp. 78-105. Hannover: ARL.
- Stifterverband Wissenschaftsstatistik (2006). *Stifterverband für die Deutsche Wissenschaft*. Essen.
- Stoiber, E. (2006). *Startschuss für "Cluster-Offensive Bayern"*. Rede zur Cluster-Offensive, Februar 2006. Bayerisches Staatsministerium für Wirtschaft, Infrastruktur, Verkehr und Technologie. <http://www.stmwivt.bayern.de/>. Accessed 21. February 2007.
- Sträter, D. (1999). Multimedia. Profiling and regional restructuring of Munich as an industrial location. In: Braczyk, H.-J., Fuchs, G. & Wolf, H.-G. (eds.), *Multimedia and Regional Economic Restructuring*, pp. 155-182. Routledge: London.
- Streit, A. von (2003). Der Aufstieg zur Medienstadt. In: Heinritz, G. & Wiegandt, C.-C.- & Wiktorin, D. *Der München Atlas*. pp. 166-168. Italy: Emons.
- Tesch, J. (2006). Soziale Aspekte des Stadtumbaus. *UTOPIE kreativ*, 192, (Oktober), pp. 910-920.
- Wiest, K. & A. Hill (2004). Gentrification in ostdeutschen Cityrandgebieten? Theoretische Überlegungen zum empirischen Forschungsstand. *Berichte zur deutschen Landeskunde*, 1, pp. 25-39. Leipzig: IFL.
- Wiest, K. & R. Zischner (2006). Aufwertung innerstädtischer Altbaugebiete in den neuen Bundesländern – Prozesse und Entwicklungspfade. *Deutsche Zeitschrift für Kommunalwissenschaften*, 1, pp. 99-121. Berlin: DIFU.
- Ziegler, A. (2003). *Technologiepolitik und Mitbestimmung. Eine exemplarische Untersuchung in den Bundesländern Bayern, Nordrhein-Westfalen und Sachsen*. Standortdebatte - Eine Reihe der Hans-Böckler-Stiftung. Marburg: Schüren.