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Economist and Planner

Alain Thierstein is currently professor for Spatial and Territorial Development in the department of architecture at TUM, the University of Technology in Munich, and also heads the urban and regional economic development group at Ernst Basler Partners Ltd., Zurich, a private engineering and planning consultancy. He was associate professor for spatial development at ETH, Zurich, a lecturer in regional economics at the University of St. Gallen, and a member of the board of the university's Institute for Public Services and Tourism from 1998 to 2000. Thierstein holds a Ph.D. in Economics and a Master degree in Economics and Business Administration. His research interests include the impact of the “knowledge economy” on urban and mega-city regions, innovation and sustainable regional development, as well as policy evaluation.



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Angelus Eisinger currently works as professor for Metropolitan History and Culture of the City of Hamburg at the University of Hamburg. Until recently he taught Urban and Regional Development at the Institute for Architecture, Hochschule Liechtenstein in Vaduz. Eisinger's main research approach focuses on the interdisciplinary and various cultural aspects of architectural, urban, and spatial developments. He is the author of several academic architectural studies and city planning. Eisinger also works as consultant and conceptual advisor for international planning competitions, and was instrumental for the founding of a transdisciplinary platform “Perimeter Stadt”.

“‘Metamorphosis 100’ describes how the Principality of Liechtenstein manages to assert itself as a successful financial services hub and center of innovation up to 2068.”



Agnes Förster

Architect, Research Associate

Agnes Förster is a research associate at the Chair of Spatial and Territorial Development at TUM, the University of Technology in Munich. She is partner in the architectural office “4architekten”, based in Munich. Förster studied architecture in Munich and the ETH in Lausanne, and worked with Herzog & de Meuron on the project “Five Courtyards”, an attempt to redesign an entire street block in the center of Munich. Her current fields of research are not only the analysis, visualization, and communication as basic tools for spatial development and planning. Förster also works on the interface of spatial development, urban planning, and design, viz., the interplay of functional and morphological spatial strategies, perception and identity of urban landscapes.



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Architect, Lecturer

An American architect, van Handel received a degree in political economy from the University of Washington in Seattle before studying architecture at the Southern California Institute of Architecture (SCI-Arc) in Los Angeles. Subsequently based in New York for more than a decade, he received a Design Award from the American Institute of Architects in 2003 for the American Folk Art Museum at Lincoln Square. Van Handel has taught at the Parsons School of Design in New York and since 2003 has been Lecturer for Design at the Hochschule Liechtenstein. He is currently based in Freiburg im Breisgau, Germany.



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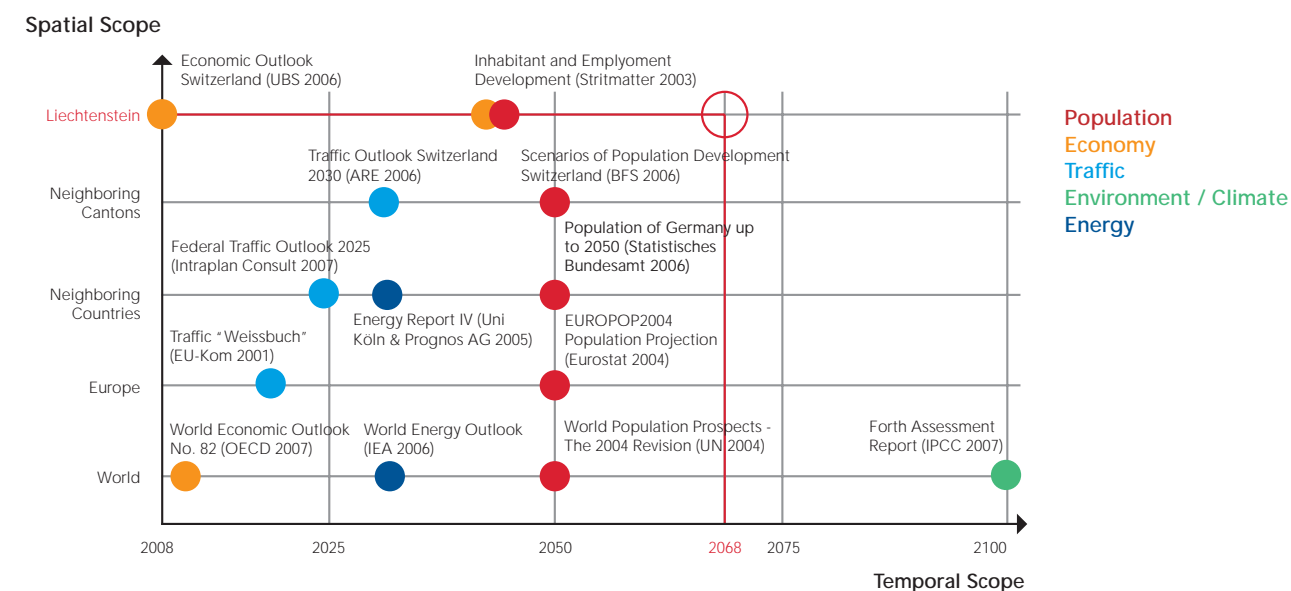
Metamorphosis 100: Liechtenstein in the Year 2068

Virtually everything changes over a period of 60 years. Yet, the future cannot be mapped out as an extension of current developments. It is the kind and extent of the transformation which determines whether the Principality of Liechtenstein can implement the goals it has set out in the official government program. To achieve these objectives the country will require driving forces of development in the form of goals, images, and imagination. Though the path to a successful future is possible, it requires the careful interplay of individual, foresighted steps.

What will the Principality of Liechtenstein be like in 2068? What people will be living there? Which companies will be based there? What kind of spatial, urban and rural structures will Liechtenstein have? How will it be linked to and involved with its neighbors, Europe's metropolitan centers and the rest of the world? Finding answers to these important questions is not an easy undertaking. Predictive techniques fail to work when it comes to looking 60 years into the future and drawing a cross-thematic, synthetic picture, as a look at themes such as population, transport, climate or the economy readily shows. The distance we can look into the future varies for each of these themes so that statements made in their regard exhibit different degrees of fuzziness. We have a relatively good idea of how populations will develop over a long period at global levels as well as for individual countries and regions. The relevant forecasts available today extend to the year 2050. Forecasts for the global climate cover a period of 100 years through to 2100. Statements on the impact of climate change for individual regions and countries, however, are extremely unclear. Current data for energy and transport covers the period up to 2030, and here we can occasionally posit assertions for a few specific countries. Scarcely any long-term predictive data is available for economic development either at a global or local level. In this case economic forecasts tend to restrict themselves to periods between one and five years (Figure 1).

This paper intends to develop scenarios for the spatial development of the Principality of Liechtenstein in the year 2068. Given the difficulties in arriving at accurate forecasts which we have just discussed, the question arises: How can we begin to make such synthetic statements? To this end our paper makes methodological use of a synthesis of scenarios and images which contain both empirical and analytical quantitative and qualitative procedures as well as creative and intuitive techniques. Taken together, they describe spatial planning as a product of the common ground that exists between territorial and functional logic. On the one hand there are the objectives and actions of statutory policy. On the other it is the driving forces for development and the derived locational requirements and investments particularly in the knowledge-based economy which express themselves spatially in a functional, almost network-like logic. The functional side of the location of Liechtenstein concerns questions regarding the range and scope of current ways of life and forms of work, the density of exchange and interaction between these different functions and international, regional and local accessibility, etc. Territorial logic reveals itself particularly in institutional questions and in the physical design of the actual urban and rural environment. These three factors, i.e. the functional, institutional and morphologically visual development of Liechtenstein as a location, mutually interact with each other.

Figure 1
Temporal and Spatial Scope of Current Forecasts



Functional and institutional questions require us to adopt an empirical-analytical approach. The scenario technique allows us to depict complex developments and establish important influencing factors, relationship patterns and possible levers of control (Stiens 2005). In this way we can portray possible and probable futures (Weinbrenner 2002).

The benefits of analyzing effect relationships in this way are evident in today's world:

- Scenarios reveal conditions and possible courses of action for desirable and undesirable developments over the long term.
- Scenarios help to develop a better understanding of the impact system under investigation. As a result they articulate possible and necessary interventions and courses of action.
- Scenarios provide orientation with regard to future developments and can help to prepare decisions. They sharpen awareness of the uncertainty and risk of any decisions and courses of action directed at the future.
- Finally, scenarios can help in reviewing and further developing the strategy of today.

We can use the scenario technique to link institutional to functional aspects, but not to capture the morphological structure, or Liechtenstein's urban and rural attributes. These are processed and made visible through the use of images. They provide the scenarios with the required degree of descriptiveness.

Hence our paper combines scientific text, diagrams and graphics as well as fictional images and stories, turning them into plausible descriptions of the future. It is structured as follows: The foundations for two scenarios of Liechtenstein's future are set out in a series of stages (sections 1–7). The starting point is a portrait of Liechtenstein as a location today. We use Liechtenstein's "footprint" to illustrate the depth of appeal which the country also has beyond its borders. The gaze into the distant future of the year 2068 comes about as a result of analyzing developmental trends and four fundamental mega themes – added value, human capital, resources and systems competition. By studying the interaction of these four mega themes we can recognize the options which the Principality has to influence the shape of the future in a functional, morphological and institutional regard. We then go on to process these findings into two development scenarios (sections 8 and 9), each of which proceeds from the way the Principality of Liechtenstein sees itself today and the official goals it currently pursues. The "Metamorphosis 50" scenario describes how the country could gradually start to fall behind its competitors in the competition to be an international business location. "Metamorphosis 100" describes how the Principality of Liechtenstein manages to assert itself as a successful financial services hub and center of innovation up to 2068. Each scenario should be regarded as an assumption: In the first, we talk about the possible consequences of not achieving the long-term strategy. In the second, we discuss the conditions required to achieve the goals which have been set for 2068.

1 Current Objectives of the Liechtenstein Government

Official goals with regard to the state, society, the economy, social security, health and foreign policy have been outlined in the 2005–2009 government program. The basic tenor of the program is to acknowledge prior achievements: It states that the high quality of life and the prosperity of Liechtenstein's inhabitants form an excellent starting point for the future. At the same time the political decision-makers see great challenges for the future in the form of radical social, ecological and economic change. The government believes it has a duty to be foresighted and identify solutions for future generations so that what previous generations have built up for the future is preserved and consolidated over the long term (Government of the Principality of Liechtenstein 2006). "These significant challenges require solutions which can only be achieved through long-term decisions (...) to lead Liechtenstein into a successful and livable future" (Government of the Principality of Liechtenstein 2006: 2). In this connection the safeguarding and strengthening of Liechtenstein as a business location is of the utmost importance. "A broadly diversified economy based on manufacturing, financial services and efficient enterprises must also remain preserved in an age of increasing competition among economic locations (...). It is therefore the aim of this Government to preserve and boost the competitiveness of the Liechtenstein

economy, particularly with regard to local enterprises, and to enhance the attractiveness of Liechtenstein as a location for innovation and as a domicile for international companies" (Government of the Principality of Liechtenstein 2006: 18).

How can we detect and describe the factors of success which will enable the Principality of Liechtenstein to achieve the goals it has outlined for the year 2068? Here we will proceed in three steps. Firstly we need to understand how Liechtenstein can be viewed as a location from the perspective of the present day. What is the spatial outreach of the country? What attributes does Liechtenstein possess today which have enabled the country to successfully position itself internationally as a quality location for hi-tech products and knowledge-intensive services? Second, we have to consider the rationale behind the global competition among economic locations. Who is competing with whom and for what in this competition? What is Liechtenstein's starting point for future development compared with its competitors? Third, we need to identify the most important means the Government has at its disposal to influence the future of the Principality of Liechtenstein. Which long-term trends are relevant to the future development of the small state of Liechtenstein and how will they impact on its ability to compete?

2 Four Footprints, or what Dimensions does Liechtenstein have as a Location?

Territorial borders, symbols and institutions are vital factors in enabling people to identify with spatial entities such as districts, regions or states (Paasi 2003). The Principality of Liechtenstein – Europe's fourth smallest state – is separated from Switzerland and Austria by 77.9 km of borders. The national territory covers 160 km² and extends 24.8 km from north to south, and 12.5 km from east to west. Between Alpenrhein and Bergen there is an altitude difference of 2,169 m (Communications and Public Relations Unit, 2008a). The state border is linked to mighty symbols, institutions and events: The Princely House, Vaduz Castle, the national coat of arms and the financial center. State sovereignty defines "insiders" and "outsiders". This institutional difference, however, is intangible; physically it is not immediately evident. Rather, the topography and man-made environment of Liechten-

stein make it appear an integral part of the Alpine Rhine Valley; visually, Liechtenstein's territory is not distinctive in this sense.

In this case, appearances are not deceiving: The business location of Liechtenstein does not end at the state border. Nor is the Principality of Liechtenstein autarkic in an economic, social, cultural and ecological sense. Instead, it is far more dependent on functional integration at local and regional levels with its neighbors. Vital functions of and for the state of Liechtenstein are performed "extraterritorially", i.e. on the territory of its neighboring states. In this case we should like to supplement the notion of a territorial Liechtenstein with that of an extraterritorial Liechtenstein. But where does the latter begin, and where does it end? To reveal the extraterritorial Liechtenstein we intend to use the metaphor of footprints. The "ecological footprint"

represents the consumption of resources and describes the area required to enable the lifestyle and living standards of a given person or country over the long term (Wackernagel and Rees 1997). In the case of the business location of Liechtenstein we intend to use the image of the footprint as follows: The footprint describes the spatial extension of Liechtenstein beyond its own borders which the country needs in order to assure the economic, social, cultural, ecological and institutional qualities and quantities required in the endeavor to assert itself as an international location. In the following section we shall discuss four different footprints of the country. Together, they characterize the business location of Liechtenstein. The four footprints explore the following issues:

- Footprint 1 – added value: Liechtenstein is distinguished by the large number of international enterprises operating in the country. How are their locations presented and what regional to global networks do they constitute?
- Footprint 2 – human capital: Liechtenstein as a knowledge-intensive location has a large number of commuters from other countries.
- Footprint 3 – cooperation with other countries: A small, modern state such as Liechtenstein is linked to other countries through a large number of regional to global cooperation agreements.
- Footprint 4 – the image of today's Liechtenstein: How does the country present itself today as a residential and rural entity in the Alpine Rhine Valley?

In addition to pinpointing a specific aspect of the economic location, each of the four footprints also describes essential courses of action which Liechtenstein faces in its search for a successful future.

Footprint 1: Added Value – the Spatial Dimension of the Knowledge-based Economy

Liechtenstein today is a successful business location with many high growth sectors that can be ascribed to the knowledge-based economy. Here we are referring to branches of the economy which largely depend on knowledge and skills on the input side and generate high value, innovative and competitive products or services on the output side. In the case of Liechtenstein three pillars of the knowledge-based economy are particularly well represented: Corporate businesses, banking and the hi-tech sector with a pronounced focus on the machine building, metal, electric and electronic industries. A clue to the significance of the knowledge-based economy for Liechtenstein is revealed when we note the proportion of the total workforce employed in knowledge-intensive branches of industry. By the end of 2005 the relevant figure was about 44 percent (Office of Economic Affairs 2007).

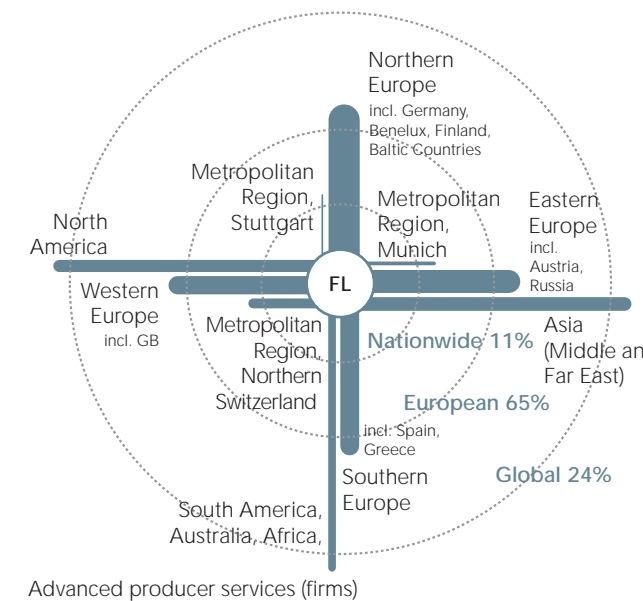
Consequently, Liechtenstein is on a par with the city of Munich, which enjoys an outstanding position within the European Metropolitan Region of Munich and within the State of Bavaria and has acted as an international hub of knowledge for these two areas ever since it achieved an equivalent proportion of 44 percent in 2006 (Thierstein, Goebel and Lüthi 2007).

Although, Liechtenstein has a reputation of being a financial services center, hi-tech businesses account for an above-average proportion of the country's knowledge-based economy. Liechtenstein is one of the most industrialized countries in Europe (Credit Suisse 2004). By the end of 2006 over 43 percent of people were working in the secondary sector (Office of Economic Affairs 2007), a far greater share than the European average or equivalent figures for Liechtenstein's neighbors. This sector chiefly consists of innovative and successful hi-tech companies that are integrated into the global economy, of which Hilti is a prime example.

The potential of a business location in a globalized world cannot solely be described by analyzing companies which operate within a defined area of investigation. Equally decisive here is the extent to which they are integrated into global corporate networks and the degree of networking with other significant locations (Castells 1996; Thierstein, Goebel and Lüthi 2007). Knowledge exchange, whether intra-corporate or out-house, plays an important role for companies in the knowledge-based economy because recombined knowledge stimulates the development of innovations (Kujath 2005). In the following we shall take a closer look at the spatial outreach of corporate activity in Liechtenstein. To this end we shall be examining intra-corporate locational networks of knowledge-intensive companies and investigating those companies which have one or more operating sites outside Liechtenstein in addition to their main site within the Principality. By calculating and weighing the hierarchy of these different sites we can estimate a degree of networking which we shall call connectivity¹. We have applied this method to Liechtenstein's 20 most important knowledge-intensive companies with multiple operating sites in both the service sector and the manufacturing sector. The findings indicate that the business location of Liechtenstein is integrated into a global network of locations through these companies.

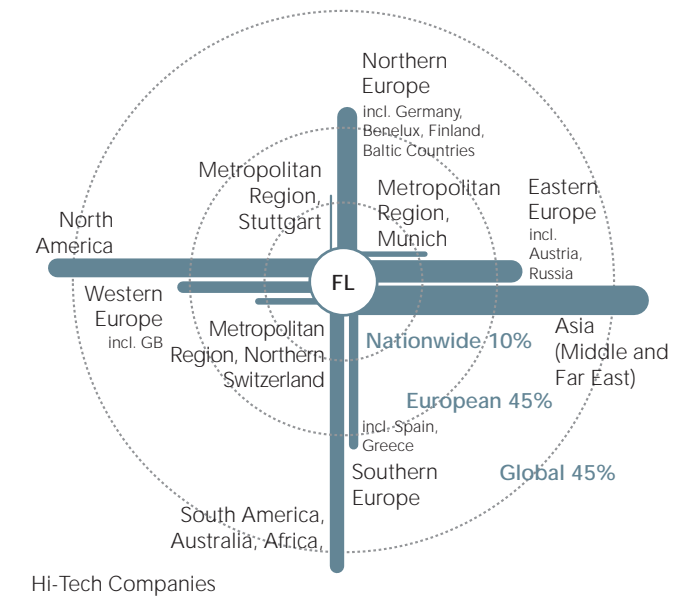
The spatial networking of Liechtenstein through knowledge-intensive companies points to specific patterns for advanced producer services (firms) and hi-tech businesses. The form of representation chosen for the following tables reveals the share which individual geographic areas have in the overall connectivity of Liechtenstein companies with intra-corporate locations outside Liechtenstein. In this case the thickness of the line indicates how large the share is. It also

Figure 2
Outreach of Intra-corporate Location Networks for Advanced Producer Services (firms) in Liechtenstein.



Advanced producer services (firms)

Figure 3
Outreach of Intra-corporate Location Networks for Hi-tech Companies in Liechtenstein.



Hi-Tech Companies

reveals the extent of extraterritorial Liechtenstein. The latter can be interpreted as an important catalyst for Liechtenstein's knowledge-based economy since it enhances business partners, customers, knowledge and innovation.

For advanced producer services (firms) the European network of locations plays the biggest role: It accounts for 65 percent of overall connectivity, followed by the global level which accounts for 24 percent (Figure 2). Liechtenstein's trust and assurance companies and its banking sector continue to base most of their business locations in Europe. If we group intra-corporate site linkage around the four points of the compass, we notice a pronounced degree of linkage above all with northern Europe, i.e. with the densely populated heart of Europe. Many of Liechtenstein's sites are also linked to eastern Europe. At a global level, ties with Asia and North America are more or less equally intensive. The southern hemisphere, however, displays only a slight degree of connectivity, thereby reflecting the pronounced weakness of this global region with regard to the expanding knowledge-based economy. On the other hand, hi-tech businesses are much more globally oriented compared to advanced producer services (firms) (Figure 3). The global level accounts for 45 percent of overall connectivity – in line with the

European average. Here the strong ties to Asia are particularly noticeable.

Until now products made by hi-tech companies have been easier to standardize than services such as corporate consulting or complex financial transactions, which are often extremely dependent on individual trust (Thierstein, Goebel and Lüthi 2007). Such standardization makes worldwide cooperation considerably easier: Product and process standards, for example, can be electronically exchanged without ambiguity. Nonetheless, hi-tech companies cannot dispense completely with face-to-face contacts in their business processes. Presumably, however, they find it easier to make use of specific advantages of a particular location such as low wages in certain countries. At such companies, production processes are frequently outsourced to other countries. The Schindler company is a good example: It was one of the first European manufacturers to commence production operations in China in the 1970s (Schindler 2008). Although, advanced producer services (firms) benefit considerably from the special legal and tax conditions which operate in Liechtenstein, they find it more difficult to cover the whole world from just one location – or from a distance, as it were. Spatial proximity to customers and the opportunity to establish face-to-face contacts during service delivery

Figure 4
Comparison of Intra-corporate Links to Neighboring Metropolitan Regions between Hi-tech Businesses and Advanced Producer Services (firms).

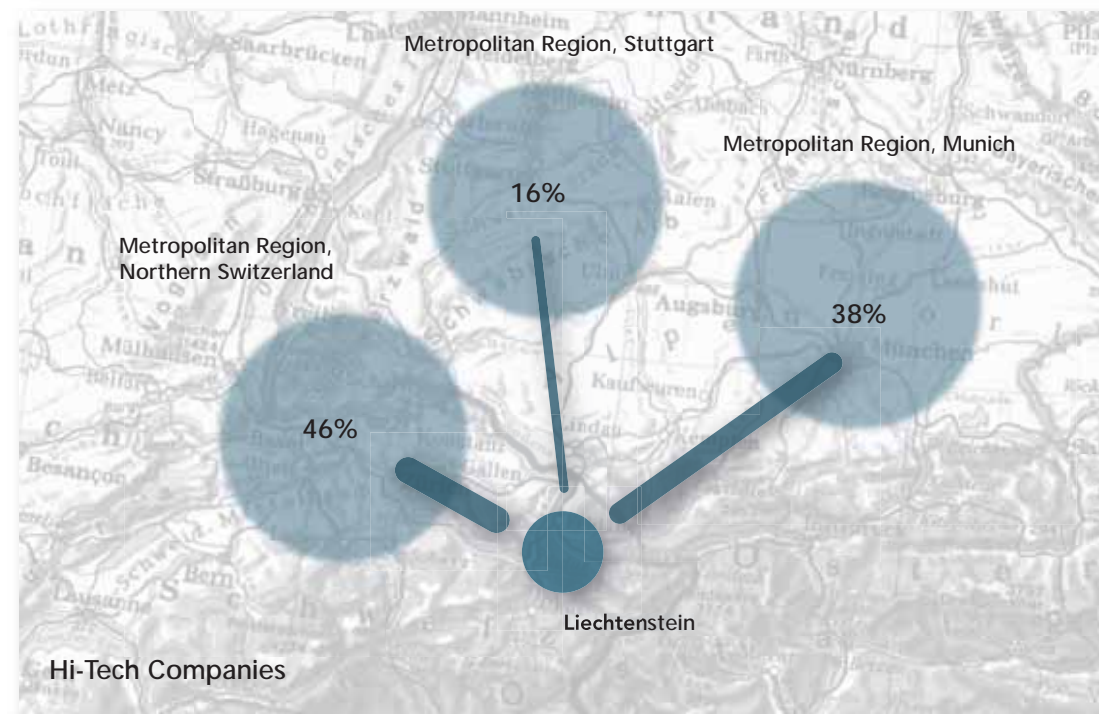
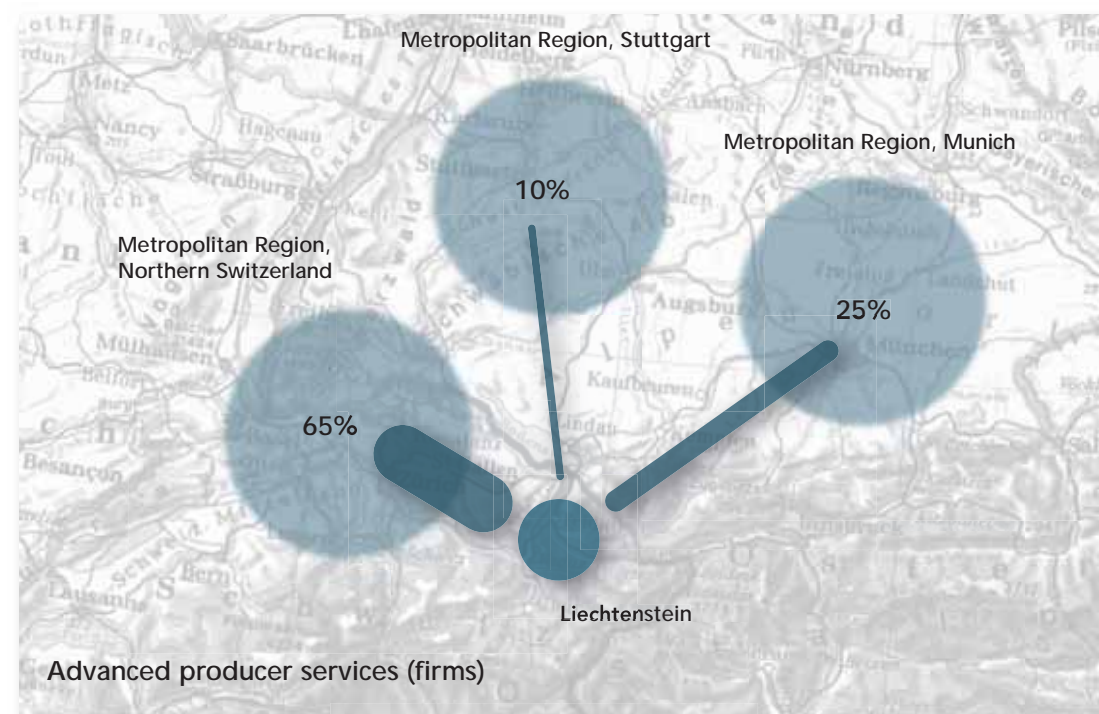
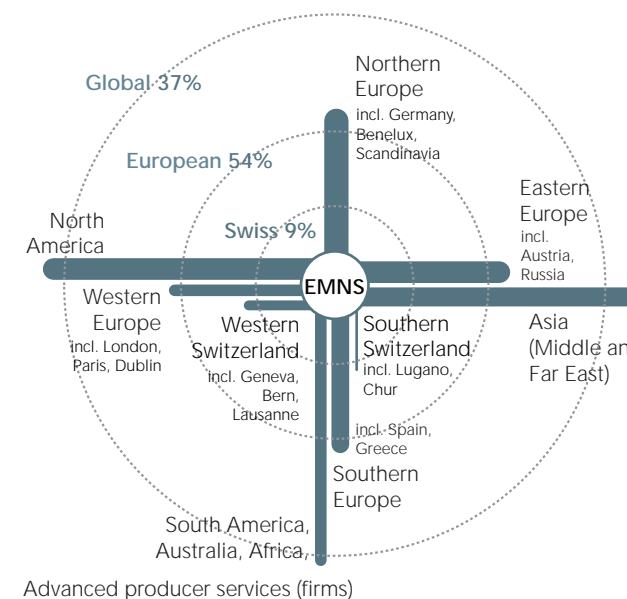


Figure 5:
Outreach of the Intra-corporate Location Networks of Advanced Producer Services (firms) in the European Metropolitan Region of Northern Switzerland (EMNS).



is of tremendous importance for these companies. The supraregional level is of comparable significance for advanced producer services (firms) and hi-tech companies. Connectivity values for the three neighboring metropolitan regions of northern Switzerland, Stuttgart and Munich each account for 11 or 10 percent respectively of overall connectivity. If we limit our view solely to the connectivity of these three neighboring metropolitan regions, we see significant differences between the two sectors (Figure 4). For advanced producer services (firms) the metropolitan region of northern Switzerland is of overriding importance: It accounts for 65 percent of supraregional connectivity. In the case of hi-tech companies, connectivity for the three neighboring metropolitan regions is spread more evenly. Here, 46 percent of connectivity can be ascribed to the metropolitan region of northern Switzerland, 38 percent to the metropolitan region of Munich and 16 percent to Stuttgart. How can such differences be explained? For the financial world, Liechtenstein's autonomy of action offers specific attributes which come with having a business location on the territory of the Principality. Zurich is an important location very much geared to international finance (Thierstein et al. 2006). The linkage patterns of the European metropolitan region of northern Switzer-

land, with its backbone of Zurich and Basle, account for 37 percent of global ties – a much higher figure than advanced producer services (firms) in the Principality of Liechtenstein (Figure 5). Banks domiciled in Liechtenstein use the proximity of Zurich as a gateway for their global business relationships. Hence a relatively large number of banks in Liechtenstein also have a branch office in Zurich. Zurich's international airport is an important location factor. With its efficient international network infrastructure Zurich Airport provides high quality accessibility for face-to-face contacts throughout the world. Only the complementary interplay between the financial center of Liechtenstein and the financial center of Zurich can generate above-average added value in this sector for Liechtenstein today and in the future.

The hi-tech location of Liechtenstein doesn't just stop at the country's borders. It should be viewed as part of the extensive regional location of the Alpine Rhine Valley, the area around Lake Constance, and eastern Switzerland. This is where many innovative companies work in the fields of nanotechnology and micro technology as well as metal, machine and vehicle engineering. Both the Swiss and Austrian sides of the Alpine Rhine Valley are ranked at the very top of European locations (Contor 2005). «Precision Valley Rheintal» is recognized as a technological location of the future; local authorities, associations and companies cooperate across borders (State Chancellery of St. Gallen 2004). Hence Liechtenstein's hi-tech companies benefit, for example, from their proximity to the Interstate University of Applied Sciences of Technology Buchs (NTB) and to other hi-tech companies in the Alpine Rhine Valley. The relationships between Liechtenstein's hi-tech businesses to the neighboring metropolitan areas are reflected in this broader regional and supraregional embedding of Liechtenstein as a hi-tech location (Figure 5).

To sum up, the added value footprint shows Liechtenstein to be a hi-tech and financial location with a high proportion of knowledge-intensive sectors. It is closely integrated into global and functional corporate networks. These links have a primarily global reach, with Europe being of particular importance to knowledge-intensive service providers. For Liechtenstein's banks the nearby financial center of Zurich plays an important role as a hub to the international world.

Footprint 2: Human Capital – the Spatial Dimension of the Employment Market

The fact that Liechtenstein's economy is heavily geared to the knowledge-based economy means that human capital assumes key importance. Human capital refers to skills and knowledge which can be acquired through education, training, professional development and experience. If Liechtenstein is search-

ing for ways to preserve its position as an attractive location for knowledge-intensive services and hi-tech products through to the year 2068 then we first have to understand who the bearers of human capital are today. What kinds of people contribute today to the above mentioned added value in the location of Liechtenstein? Where do they come from?

Liechtenstein has a population of 35,000 or so permanent residents. A good 31,000 people were in gainful employment at the end of 2006 (Liechtenstein Office of Economic Affairs 2007). Some 15,000 wage earners – i.e. almost 49 percent – commute to their place of work in Liechtenstein from their homes in Austria (6,794) and Switzerland (7,258). Only a small number of commuters are prepared to travel the relatively long way from Germany. If we then factor in the 6,000 foreigners resident in Liechtenstein it is clear that foreign citizens already occupy two out of three jobs in Liechtenstein. These figures clearly reveal Liechtenstein's dependence on a workforce which is resident in large part outside the state borders. Yet this dependence is not just quantitative in nature. Liechtenstein's industrial structure requires an exceptionally skilled pool of labor. Yet it is precisely these highly skilled people who are increasingly in demand across the world and who can choose between different places to live and work in according to their individual preferences. The manpower requirements of Liechtenstein's companies cannot be covered by the young people educated and trained at the Hochschule Liechtenstein, especially since they can also apply for jobs on an international employment market.

The willingness to commute is closely related to the time it takes to get from home to work and to the distances involved. Furthermore it is generally true to say that the more attractive a place to live or work is, the more people are prepared to accept longer journey times and the greater costs of daily commuting (Stutzer and Frey 2007). In this respect the message conveyed in Figure 6 is hardly surprising: 43 percent of all commuters to Liechtenstein come from municipalities just across the border in Austria and Switzerland. 64 percent of commuters have less than 25 kilometers to travel on their daily way to work. If we now add the commuters from the Swiss Alpine Rhine Valley and the rest of Vorarlberg we see that a total of 89 percent of foreigners commuting daily to Liechtenstein come from the region. Only a very low proportion of the workforce commutes to Liechtenstein from outside the Alpine Rhine Valley. 8 percent come from Switzerland, probably the majority of them from the Greater Zurich area. The 3 percent of commuters from Germany are also prepared to accept long journey times to get to work. For the metropolitan region of northern Switzerland there is evidence to show that employees in knowledge-intensive sectors of industry are also pre-

pared to go the extra mile to work than people working in other sectors (Thierstein et al. 2006). We may also assume that in the case of Liechtenstein there is an above-average number of highly qualified people who are prepared to commute long distances, e.g. from the Greater Zurich area.

Liechtenstein's immigration provisions with regard to reasonable commuting times effectively establish a catchment's area for cross-border commuters. Under Article 18 of the Movement of Persons Order foreigners employed in Liechtenstein can currently only receive a residence permit for Liechtenstein if they cannot be reasonably expected to perform a cross-border commuter activity. The same Order also includes commuting times as one of the criteria. Foreigners living within a 60 minute radius of the Principality and working in Liechtenstein have only a slim chance of gaining a Liechtenstein residence permit through the lottery procedure; they are virtually compelled to assume the status of cross-border commuters (Biedermann 2007; Simon 2007). By far the overwhelming number of commuters spend less than 30 minutes in their cars commuting to work. As a rule, Liechtenstein is easy to reach by car from areas just across the border thanks to the immediate proximity of the motorway and several bridges across the Rhine. On the other hand, the Principality has a poorly developed public transport system compared to the rest of the region. Commuting by public transport from many residential areas is fairly unattractive due to the need to change in Buchs on the Swiss side of the border. So while it takes for example about 30 minutes to drive from Chur to Vaduz, the same journey on public transport takes 60 minutes, or twice as long, because passengers have to change at least once if not twice to reach the same destination. The time saved driving by car instead of taking the train from Zurich to Vaduz is marginal given the high quality of the trains in service on the long section from Sargans to Zurich. On the Swiss side the relatively peripheral north to south rail link through the Alpine Rhine Valley plays a subordinate role. For the most part, the public transport network within Liechtenstein is based on buses. Only the municipalities of Schaan and Nendeln have railway stations: Even so, they offer less than attractive connections in terms of journey times, service frequencies and the need to change. The important stations of Buchs and Sargans on the Swiss side and Feldkirch railways station in Vorarlberg operate far more regular services but can only really be reached by bus from many places in Liechtenstein. The journey from Vaduz-Schaan railway station to Zurich International Airport takes an average of two hours by public transport and involves two to three changes. Altenrhein regional airport can be reached by bus and train in a good hour, but also requires passengers to change twice.

Figure 6
An Overview of where Commuters come from and their Commuting Times to Liechtenstein.

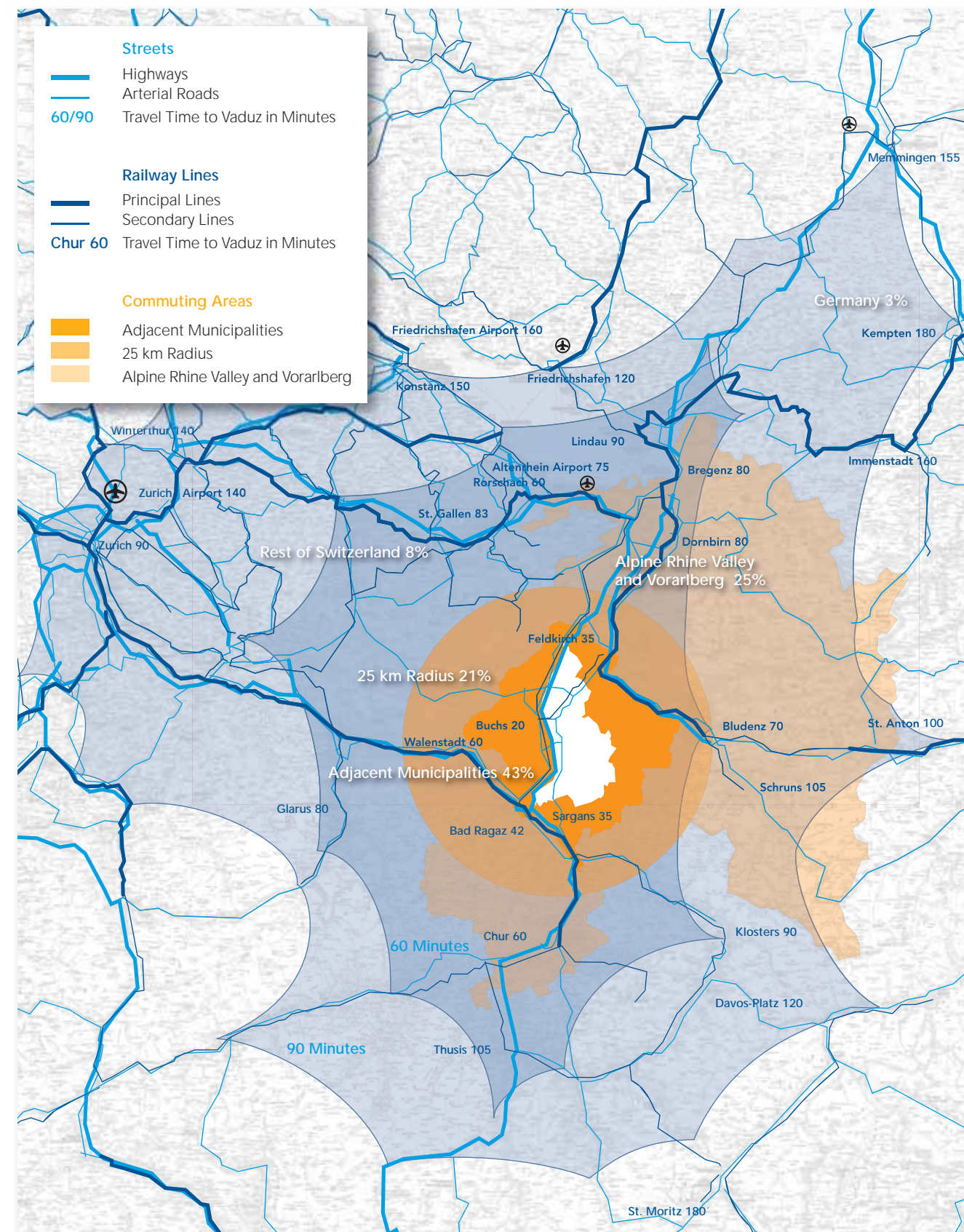
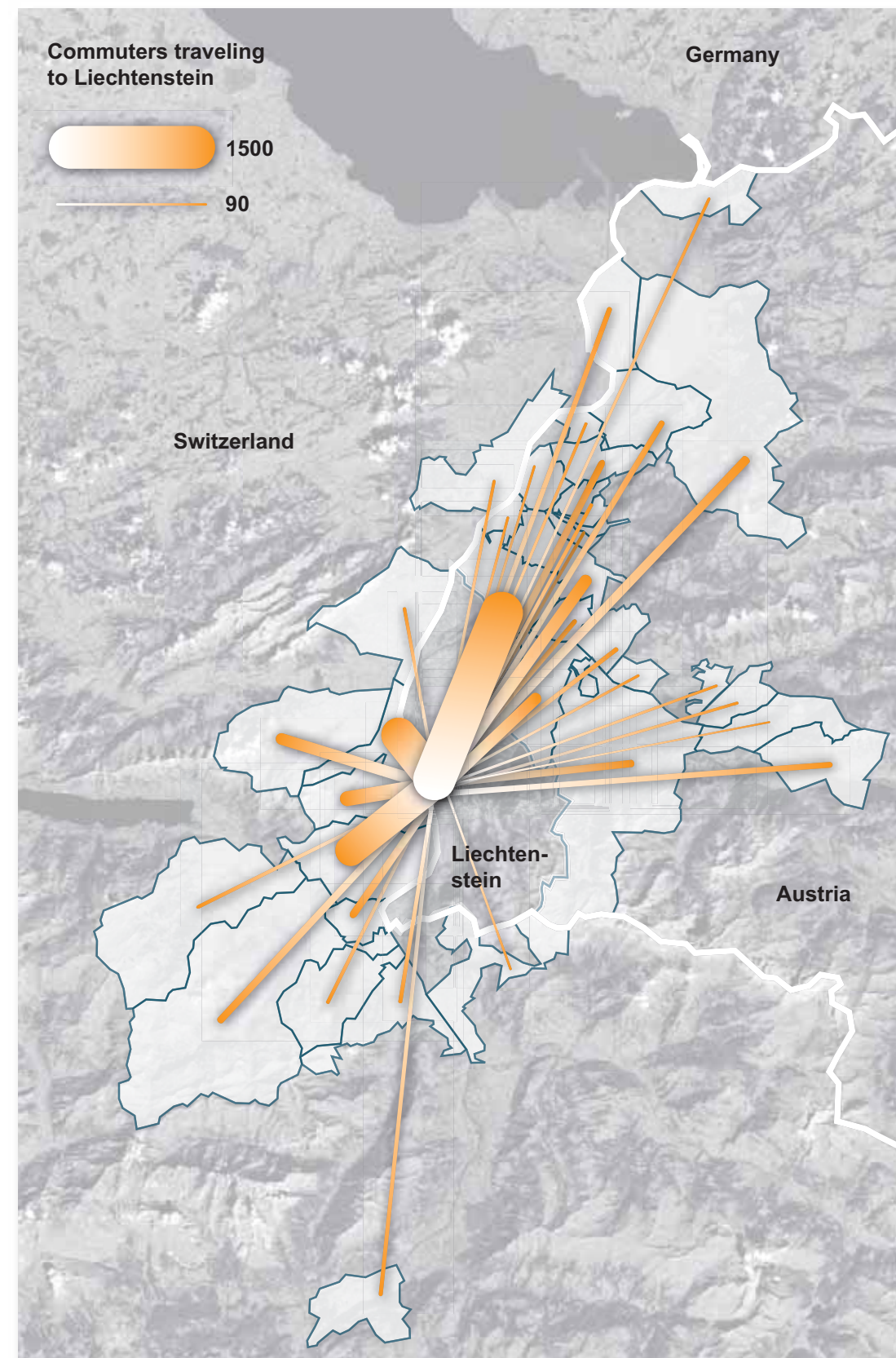


Figure 7
Commuter Flows in absolute Figures: All Municipalities with over 90 Residents commuting to Liechtenstein.



In overall terms, the human capital footprint clearly reveals how dependent Liechtenstein is on its surroundings due to its requirements for skilled manpower. Essential parts of Liechtenstein can already be found outside its territorial borders. The attractive high-wage location with its promising sectors of industry and companies also leads to a high surplus of commuters because immigration regulations currently limit the number of people allowed to move to Liechtenstein.

Footprint 3: International Collaboration – the Spatial Dimension of Political Cooperation

Scarcity of resources poses a major challenge to a small state such as the Principality of Liechtenstein (Simon 2006a). As well as being dependent on imports, small states are particularly tied to certain foreign markets for their exports. Moreover small states frequently have an insufficient critical mass of population, tax payers and potential customers to provide certain services effectively, efficiently and autonomously. This means that certain investments in projects such as flood protection, specialist clinics or transport infrastructure, etc., can only be made in cooperation with neighboring countries.

In general, small states have a greater need for cooperation than larger ones. Liechtenstein is pro-active and self-confident in adopting this path. Here we can identify three focal points of cooperation in a spatial sense:

- Regional cooperation in the Alpine Rhine Valley for concretely defined problems and tasks,
- More broadly pitched cooperation with Switzerland and foreign countries close to Liechtenstein's borders, and
- Agreements at European level.

For example, lively cross-border cooperation is taking place in the Alpine Rhine Valley and the area surrounding Lake Constance under the European Union's INTERREG programs. With regard to rail transport, Liechtenstein has recourse to a foreign company: Austrian Railways (ÖBB) operate the only section of track on Liechtenstein territory on the Buchs to Feldkirch line via Schaan-Vaduz. The Principality has been in a customs union with Switzerland since 1923 and has had a currency agreement with the same country since 1980. Hence Liechtenstein is part of Swiss customs territory and has the Swiss Franc as its currency. Under the provisions of the Vaduz Convention in 2002 most of the bilateral agreements concluded between Switzerland and the EU, for example with regard to the mutual free movement of persons or the protection of intellectual property equally apply to Liechtenstein. In 1991 Liechtenstein joined the European Free Trade Association (EFTA). This organization aims to promote economic growth, trade and full employment among the non EU states of Ice-

land, Norway and Switzerland. Since 1990 Liechtenstein has been a member of the UN and among other things is involved in the fight for human rights and against terrorism on a global level. The Principality also attaches extreme importance to its membership of the European Economic Area (EEA). Since 1995 this has ensured that Liechtenstein enjoys equality of access to Europe's markets with regard to the free movement of people, goods, capital and services. These rights are of pivotal importance in marketing financial service products.

To sum up, the cooperation footprint shows that Liechtenstein is working carefully in a number of ways on specific issues with its close and more distant neighbors in order to obtain strategic advantages. The Principality relies on its sovereignty in other matters. Hence Liechtenstein has not joined the European Union, for example, since accession would severely restrict its autonomy of action in marketing itself as a financial center.

Footprint 4: The Look of Liechtenstein today – the Spatial Dimension of everyday Liechtenstein

Liechtenstein today represents a dynamic little node in Europe's network economy. In this respect the country presents itself an intensively integrated network of settlements which has developed out of existing village structures over recent decades. In particular, the region of Schaan-Vaduz-Triesen has witnessed extensive building development around the valley and considerable spatial concentrations of employment areas. Despite the dynamics of this development, which is changing the landscape, the Alpine Rhine Valley today still forms the strikingly rural setting which links the individual municipalities with each other, even though in certain places municipal areas have started to converge. Architecture in Liechtenstein continues to be more or less rural in its methods and design. The buildings are low in height and have low levels of density and utilization. There are scarcely any urban elements: Until now they have hardly appeared to fit in with the way Liechtenstein sees itself. The «Städtle» in Vaduz is a good illustration of this. Although it is a diminutive form of the German word for town (i.e. "Stadt"), the buildings in this area do not feature any examples of recent urban architecture, with the exception of the Kunstmuseum. Similar requirements to preserve a village-like character have become tied up in contradictions and can also be seen in the neighboring Herrengasse, an arterial road to and from the center which is lined by large but flat bank buildings.

These initial findings are also confirmed when we begin to look at the other municipalities in the country. In very general terms traditional patterns such as the single family home and the detached building dominate the field of housing. Above all, the rural aspect is also reflected in public space. The squares or streets

Figure 8
Current Postcards from Liechtenstein.



Vaduz Städtle: Largely perceived as a pedestrian zone for tourists, the "Städtle", a diminutive form of the German word for city, is a mixture of outdated urban contrivances and attempts at village flair. With the exception of the recent Kunstmuseum, the architectural intent of the area seems to be focused on the simulation of an urban village, complete with historical castle and city hall.



Liechtenstein Unterland: Liechtenstein Unterland: Despite the fact that 98% of its economy is comprised of global financial and high-tech industries, Liechtenstein continues to identify itself with images of its agrarian past. The suggestion of rural life conveyed in these images is no longer representative of contemporary lifestyle patterns in Liechtenstein.

which mainly emerged around the church and council building – the Rathaus – have frequently become traffic areas or rarely frequented districts that are barely integrated into everyday life. The settlement structure of municipalities such as Balzers in the south or the small municipalities in the north of the country has always tended to refer powerfully to the landscape, although there are signs that this is starting to disappear given the unremitting pace of development. The synopsis of this and the other footprints reveal that Liechtenstein has undergone both a functional and a morphological transformation. Construction styles and spatial organization principles have yet to be adapted accordingly, however.

We have looked at four fundamental footprints of Liechtenstein – added value, human capital, international cooperation and the physical and spatial look

of the country. The footprints provide us with an initial understanding of the physical and non-physical extent of Liechtenstein as a functional location. Proceeding from the territory of the Principality we notice intensive ties and links at regional, supraregional and global levels. Company networks, daily commuters from abroad and intensive cooperation with foreign countries reveal the existence of an exterritorial Liechtenstein. The small state of Liechtenstein is profoundly incorporated and integrated in an economic, political, social, cultural and ecological sense with the exterritorial Principality. A significant factor in the future development of the country is how the area can represent and assert itself in the international competition between locations. In the following section we intend to identify and describe four important mega themes and their impact on the competitiveness of Liechtenstein.

3 The Principality of Liechtenstein as a Competitor – 4 Mega Themes of International Competition between Locations

How can Liechtenstein develop itself as a location of the future in comparison to other locations which are also competing for real capital, qualified labor, desirable public investments, an intact environment and for attention and image? Liechtenstein's competitors can be found at regional and global levels. Put in simple terms, competition between locations describes the race in which each location's specific production factors compete for the above mentioned mobile factors. The point of this internationally staged competition is to identify possible comparative competitive advantages for the future. It is in this extremely dynamic context that we also have to position our considerations with regard to Liechtenstein in 2068.

The economic development of the Principality of Liechtenstein depends substantially on international trends. For Liechtenstein just as for other countries, globalization is an externally driven, significant and dynamic force for development. We take globalization to mean integration into the world economy with growing international interlinkage in the product and factor markets (Eickhof 2003). The dynamics of economic integration at global levels put players from the worlds of business and politics under increased pressure to compete. In the ongoing globalization process the specific opportunities and risks that Liechtenstein faces in its future development emerge from the fact that it is a small state (Simon 2006a). We assume that this circumstance will remain unchanged over the next 60 years, so we need to consider the idiosyncratic fea-

tures of its existence as a small state. "A small state is not merely the miniature version [...] of a large state" (Kirt and Waschkuhn 2001: 39). Smallness significantly defines the room for maneuver small states have in their economic development. In the context of globalization most of the disadvantages small states faced due to their reduced size have become less important while many of the advantages they enjoyed have gained in importance. Hence the disadvantages of the small single market are increasingly receding and the economic strategies of niche and special products, frequently born out of necessity, are gradually turning out to be recipes for success in a globalized world (Simon 2006a). "In an open world the question of whether a country is rich or poor hardly depends on how big or small it is" (Rothschild 1993: 86). The economic disadvantages of small states which researchers focused on, particularly in the 1960s, are deemed no longer to apply. This does not mean, however, that small states should be regarded and treated like larger countries with regard to their future development.

In addition to size the geostrategic location of a country also plays a particularly decisive role. Liechtenstein's geographic location in "old" Europe is not ideal with regard to the new growth markets beyond the Middle East, China and India. Moreover, the smallness of a country always goes hand in hand with intrinsic shortages. Although, they no longer necessarily lead to the attendant consequences of the 1960s, they are still of great significance for the future development of

small states in the context of globalization dynamics (Simon 2006b). The economic development of small states and larger states can ultimately start to resemble each other in fundamental ways. But the ways and underlying strategies of getting there are different: “And since the small state is not just the smaller counterpart to the large state it employs (...) other methods and strategies to achieve its particular goals” (Kirt and Waschkuhn 2001: 39).

Which particular challenges will the small state of Liechtenstein be facing over the next 60 years to achieve its goals? In the coming decades four mega themes will determine the chances and risks of Liechtenstein's national economy to position itself successfully in the international competition for locations and future potential. For the Principality of Liechtenstein this has four specific repercussions. First it must ensure it has an exceptional ability to generate added value, second it has to attract and retain the performance-oriented human capital required, third it must systematically play out its role in systems competition and fourth it has to secure the availability of natural resources. In the following section we shall examine these four mega themes for Liechtenstein's future from the perspective of today and indicate how they interact with each other. They shall form the basis of a plausible assessment of future developmental dynamics.

Mega Theme 1: Value-added Intensity

The Principality of Liechtenstein is the “richest” country in the world according to gross national income per capita in the 2004 rankings of the United Nations (Simon 2006a). The small size of the country has always forced the national economy to concentrate on looking beyond its borders. In this respect economic success could not be achieved through mass production in view of Liechtenstein's limited resources. On the other hand, the country has been successful in concentrating on niche products and specializing in hi-tech production and knowledge-intensive services (Simon 2006a). The success of the financial services sector is closely related to the fact that the small state used to be able to exploit the legislative divide that separated it from its neighbors and competitors in systems competition. For these sectors of industry, Liechtenstein's sovereign right to make its own laws is a pivotal condition for a flourishing economy (Simon 2006a). The high degree of orientation towards foreign markets and the fact that financial services have become specialized in offering certain niche products have resulted in exceptionally high added value. These factors offset the original disadvantage of the internal market and the limited resources of the small state. The Principality of Liechtenstein is highly successful at being an attractive place for foreign workers and compensating for its lack of sufficient manpower resources. Maintaining this high

value-added intensity through to the year 2068 and beyond forms an essential part of the official goals set out by the Government of Liechtenstein. The dynamic development of the global economy and the close interplay with the other three mega themes represent the challenging context for reaching these goals.

Mega Theme 2: Human Capital

Competition for highly productive and qualified staff in the knowledge-based economy is becoming increasingly tougher. This is no longer solely true of companies: Locations, too, distinguish themselves today through the quality and extent of their available human capital (Michaels, Handfield-Jones and Axelrod 2001). Due to the low number of inhabitants manpower resources have traditionally been regarded – in a relative sense – as being a scarce resource in small states. The footprints display the extent to which Liechtenstein is dependent on foreign workers. Even today, only 30% of jobs in the country are held by Liechtensteiners. Liechtenstein's limited manpower resources are offset by cross-border commuters. In the case of the Principality of Liechtenstein the current scarcity of manpower resources is exacerbated by an exceptionally high demand for human capital in the knowledge-intensive sectors of industry which already exist today. With the ever growing importance of the knowledge-based economy in the future and the need to further develop the economic niche and specialization strategy, the availability of human capital is becoming a key question for the future of Liechtenstein. How can the Principality maintain and boost its attractiveness – both at territorial and exterritorial levels – for qualified and highly qualified manpower in competition between locations at regional and global levels?

Mega Theme 3: Systems Competition

Compared to larger countries small states have a relatively larger room for maneuver in terms of sovereignty and are able to adjust more rapidly to developments due to their less complex decision-making structures. At the present time Liechtenstein is deliberately establishing a legislative divide to its competitors – particularly with regard to tax-, persons- and companies law. As a result of globalization the traditional, special role accorded to small states is entering a new, global form of systems competition. Like private companies, political players of different nation states are in competition for good customers: Attractive tax service packages attract mobile factors such as real and financial capital as well as highly qualified workers (Vanberg 2005; Simon 2006a). Small states today are no longer the sole providers of such alternative institutional arrangements. On the other hand certain forms of systems competition are increasingly encountering resistance

from larger states and the community of states. Tax havens are anathema both to the EU and to the OECD. Furthermore, ex ante harmonization is a means used by larger states to prevent institutional competition from the outset (Simon 2006b).

In addition to systems competition different forms of integration also form part of the elixir of small states: The scarcity of resources in the small state is partially resolved on the one hand by outsourcing; strategic partnerships and alliances are intended to reduce uncertainty. Finally, certain location attributes such as accessibility can only be generated or secured through exterritorial engagement. The question of the balance between autonomy and competition on the one hand and integration on the other is at the heart of the way the small state of Liechtenstein sees itself given its location in the middle of one of the world's largest islands of harmonization: The European Union.

Mega Theme 4: Availability of Resources

Small states are drastically short of resources. Here we distinguish between two types of resources – *natural and financial*. Potential competitive disadvantages to a small state such as the Principality of Liechtenstein arise whenever there is a scarcity of such resources in relation to larger countries, i.e. to Liechtenstein's competitors.

Natural resources refer to the function of the natural environment to supply raw materials and energy. The scarcity of natural resources is not a property specific to small states since these raw materials are distributed unequally across the world. If we examine the life-preserving function of nature then the Principality's economy may be lacking, but this is outweighed by the consideration that nature has to be understood as a global environmental asset as far as its ability to preserve life is concerned. Consequently, Liechtenstein does not incur any specific competitive disadvantages from its natural resources and economy of nature. Yet strategies for action appropriate to small states are required in order to ensure supply and to safeguard resources over the long term. If we refer to nature's consumerist function, to the *man-made*

environment, then quality and quantity play an important role in the sense of being a soft location factor. In certain circumstances the quantitative finiteness of this resource may mean less diversification. Furthermore, competing uses of available land may impair the attributes of the man-made environment. From an economic point of view *the spatial scarcity of resources*, the finiteness of the national territory does not initially lead to any competitive disadvantages (Rothschild 1993): In the competition between different economic and non-economic forms of utilization the ones generating the greatest added value will come out on top in the land market. Yet the restrictions of the available area can also mean restrictions for branches of industry requiring large premises to operate in and the provision of the necessary transport infrastructure within Liechtenstein. Furthermore, high property prices may lead to prosperous foreigners and successive generations of local residents crowding out the housing market.

Liechtenstein has a clear competitive disadvantage by virtue of its limited *financial resources*. As a rule, small states experience considerable cost disadvantages because they have to finance costly public investments from a much smaller pool of tax payers. Small states are increasingly unable to enjoy the positive effects of operating economies of scale the faster the underlying technologies change and the more supply requirements increase or change at international level. Frequently, the economically efficient provision of public-sector goods and services in Liechtenstein can only be ensured through cooperation with geographically close and more distant countries.

The four overriding themes which have now been identified will play a decisive role in determining the opportunities and risks of the Principality of Liechtenstein to position itself successfully in the international competition among business locations. Before turning our attention to the future we would like to briefly outline the main features of Liechtenstein's competitiveness as a company location and a location for qualified workers.

A multifunctional landscape.

A multifunctional landscape

From a vantage point high above Schaan-West, one's gaze across the valley is first captured by the nearly pristine natural landscape. Looking closer, one notices the forested bank of the Rhine before one's sight is drawn down along the valley stretching out towards Switzerland. Those who refer to this regional park in the Alpine Rhine Valley in technical, descriptive terms fail to capture the lyricism of the new green belt that has become a trademark of the new Alpine Rhine Valley. The secrets that lie behind such lyricism can nevertheless be revealed.

The green belt acts not only as a representation of the natural world, it also fulfills many functions and has thereby garnered many supporters. Walkers with their frisky dogs, joggers and children at play all testify to its popularity. They embody characteristic aspects of the particularly urban daily life of Liechtenstein that has emerged in recent decades. Here the classic urban attributes of proximity, density and mixture are integrally combined with landscape qualities that are usually only to be found much further away. This integration is precisely where the economic value of the green belt lies: Real estate specialists such as M. Atter ultimately assess property on the basis of local economic performance and here the landscape has made a decisive contribution. M. Atter regards the activation of landscape potentials achieved through carefully devised legislation as a unique characteristic that has enabled Liechtenstein to stand out from its competitors. For urbanists and planners at the Hochschule Liechtenstein, the green belt has proven to be the powerful instrument guiding housing development policy as originally intended and outlined in the vision "Metamorphosis 100" that was launched by the Liechtenstein government. This vision has also enabled the resolution of apparently irreconcilable positions such as the needs of local businesses and the requirements of nature and landscape conservation. Ecologists and animal lovers alike appreciate the sweeping, continuous landscapes and the meandering river courses that have been carefully restored to their natural state. As well, the achievement of these qualities need not come at a cost to contemporary accessibility, as the example of the Alpine Rhine Valley demonstrates. The new high-speed rail link between Munich, Vaduz and Zurich merges just as seamlessly into the landscape of the Alpine foothills as the network of the excellent public transport system connecting the two urban centers, one in the north and the other in Vaduz-Schaan, to the Alpine Rhine Valley.



4 Liechtenstein's Competitiveness as a Company Location

The Principality of Liechtenstein today is a successful location for companies in the hi-tech and financial services sectors. Yet it would be a retrograde step in the long term if the country were simply to sit on its laurels. Above all, the business models of Liechtenstein's banks are based on their attractiveness for specific and, as a rule, affluent customers. The rise of certain states in the Middle East region and in Asia as well as the dynamics of globalization have led to a situation in which the market for the provision of financial services to extremely wealthy private customers is not solely restricted to Europe and America. Liechtenstein's banks have responded to this by opening up branches in these countries. Hence LGT Bank operates branches in Hong Kong, Singapore, Bahrain and elsewhere, and has for example established a presence on the British Virgin Islands or the Cayman Islands. Liechtensteinische Landesbank has a site in Abu Dhabi. Even so, the bulk of services continue to be delivered in Liechtenstein. This is where most of the staff are based. The decisive challenge for the future is to achieve sufficient critical mass in foreign markets in order to remain successful over the long term. In Europe countries such as Luxembourg and Switzerland can also attract customers on the basis of the special provisions they offer for bank client confidentiality, and hence compete with Liechtenstein.

Hi-tech companies today are utilizing the opportunities offered by globalization to lower their payroll costs by outsourcing production to low-wage countries. Many of Liechtenstein's hi-tech companies manufacture top

products using state-of-the-art technology. The profit margins they can achieve enable them, for the moment at least, to continue their manufacturing operations in the high-wage country of Liechtenstein. The business models of these sectors are difficult to standardize, however. They tend to operate in global markets and have highly ramified corporate networks. Their activities in Liechtenstein are frequently focused on development tasks. The current success of these companies is in overall terms due to their high skills base, capital intensive production and intensive R&D activities (Communications and Public Relations Unit 2008b). On the other hand Eisenhut (2004: 55) has pointed out that the technological intensity of companies in Liechtenstein is only average in international comparison. Structural change will also continue to pose a challenge for Liechtenstein's future. The competitive situation of hi-tech businesses domiciled in Liechtenstein is in principle no different from the ones in Switzerland or Austria, two other high-wage countries. In globalized markets the state of Liechtenstein has only a limited influence on the success of its hi-tech-companies. Ultimately, the latter have to assert themselves on the market through innovative, quality products and services. The situation is quite different for companies in the financial services sector. They derive greater benefit from a careful policy which uses sophisticated regulatory solutions to enable them to offer interesting niche products. Liechtenstein's greatest weakness as a location is deemed to be the availability of qualified manpower.

5 Liechtenstein's Competitive Situation with Regard to Human Capital

The competition between locations for human capital takes place at many different spatial levels. Manpower starts to move across borders and language barriers if it has the sufficient incentive to do so. The employment market for skilled workers and managers is increasingly becoming global in outlook. Global companies and corporations have to learn about, understand and take into consideration the different cultures of both customers and staff. On the other hand, however, the pool of qualified and highly qualified manpower is unequally distributed across the world. Although, demographic change will impact negatively on the supply of skilled workers in the medium to long term in the industrialized nations of the west, skilled workers in Eastern Europe, for example, are faced with an insufficient supply of jobs in their region. In the growth markets of the Middle and Far East the increasing demand for skilled manpower cannot as yet be satisfied by available local resources. To attract this potential of internationally mobile "talents" companies are obliged not only to make sufficiently attractive offers. Their corporate locations also become subject to scrutiny. Highly qualified staff ask about exceptional location attributes with regard to the quality of housing, life, education, culture and leisure as well as accessibility; these are the so-called "soft" location factors. They are intended to minimize the temporary disadvantages experienced by families because of the high mobility of such workers. At the same time the locations are challenged to integrate this group of work migrants with their elevated requirements, sometimes major cultural differences and in part temporary nature of their stay.

The international competition between locations for human capital is further exacerbated in the case of Liechtenstein by the fact that such competition takes place at regional and supraregional levels. Here mobility thresholds are that much lower: On the one hand, people can commute to different, alternative places of work from just one residential location. On the other, moving from one residential location to another within the German speaking areas is more convenient and easier to contemplate. Figure 9 provides a summary of the exceptionally attractive residential locations within the commuter belt of the Principality of Liechtenstein at regional and supraregional levels. All of the locations indicated are within the 90-minute commuter zone. The map offers two ways of reading the competition between locations for a highly qualified workforce. On the one hand it shows the absolute attractiveness of the territorial and extraterritorial Liechtenstein in the competition for international "talents". Which residen-

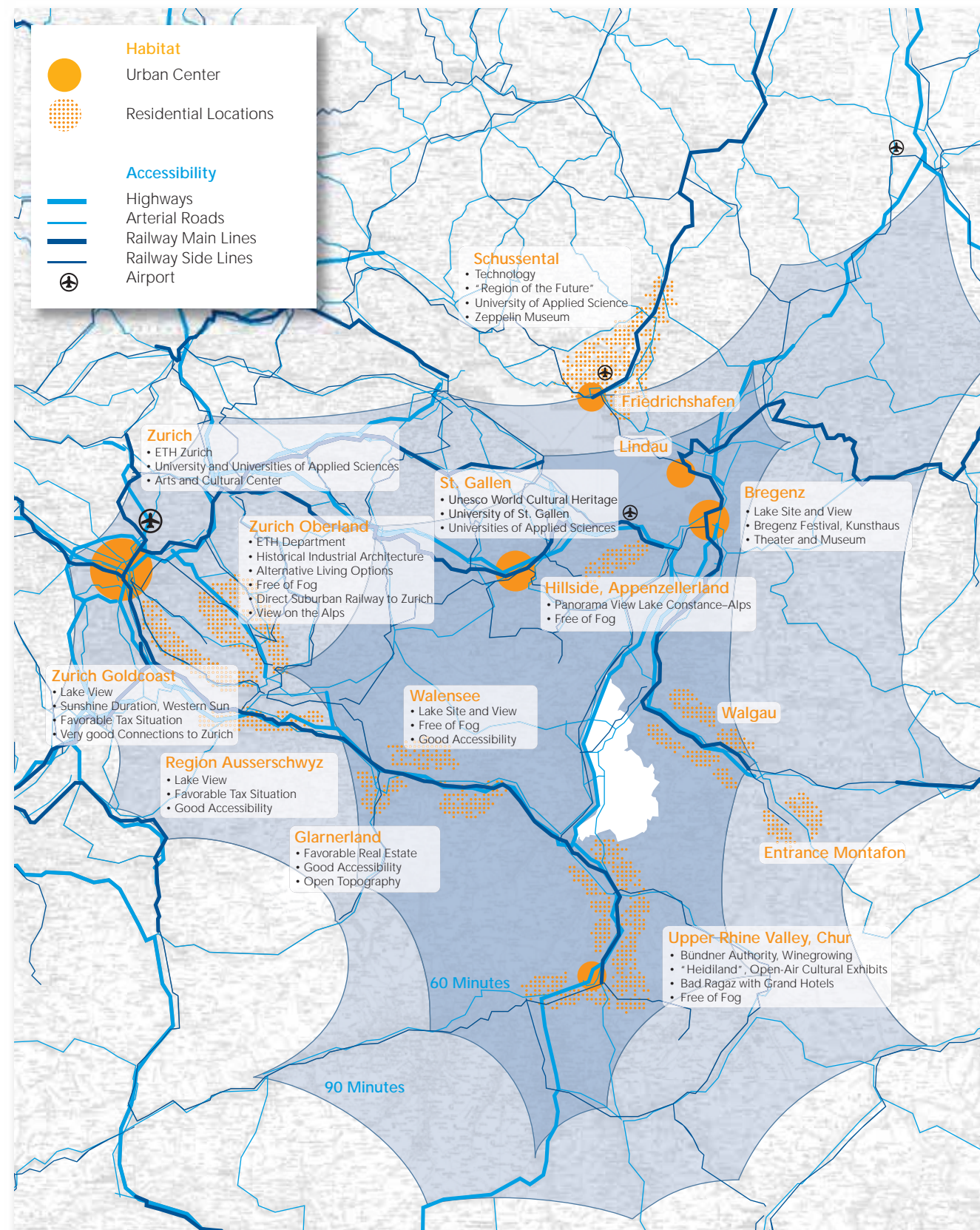
tial areas are available for the highly qualified workers which Liechtenstein would like to and indeed must attract from outside the commuter area, i.e. from international locations? On the other hand the locations indicated are also competing with each other at a regional and supraregional level. Which economic areas can benefit most in the competition for human capital from the specific attributes of residential areas and their relative accessibility?

A first indicator of outstanding quality in living conditions emerges when we compare prices of rented apartments and freehold apartments in Switzerland (Wüest + Partner 2008). Here, the price of real estate is determined by the features of the macro location, micro location and the quality of the property itself. In the case of macro locations, centrality is one of the most important objective factors. It can be measured, for example, in terms of the journey times to a metropolitan area, an urban center or to the airport. Furthermore, the different fiscal capacities and tax rates of municipalities play an important role in Switzerland. An important price factor in the case of micro locations is above all the average number of sunshine hours, which is related to the gradient and exposure of the slope as well as the altitude of the property above sea level. Another consists of the site offering distant views or views of a lake (Zürcher Kantonalbank 2004).

Expensive residential areas are to be found in the Greater Zurich area, in the districts closer to the city center, on the northern and southern shores of Lake Zurich and in the Zurich Oberland. Within the 60-minute catchment's area of Liechtenstein quality residential areas are located i.a. in the Chur Rhine Valley around Bad Ragaz/Maienfeld and around Chur/Bonaduz, from St. Gallen to Rorschach on Lake Constance, in Appenzell, in the Ausserschwyz region on Lake Zurich and on Lake Walen.

If we apply these factors to the central and lower districts of the Alpine Rhine Valley we notice a paucity of exceptional places to live in. Apart from the cultural center of Bregenz and the mountainside locations on the Pfänder exceptionally attractive residential areas appear to be in short supply – both in urban centers and in rural areas. The Principality of Liechtenstein is no exception in this regard. In contrast there is noticeable competition between residential locations in the area between Zurich, Lake Constance and Grisons. The attractive residential areas in the countryside feature lakeside locations and views of lakes and mountains; the topography is dynamic, the areas are free from fog and enjoy plenty of sunshine. The value

Figure 9
 The Competition between Residential Locations: Attractive Residential Areas within the “statutory” Commuter Belt around Liechtenstein, based on a simple daily 60–90 minute Drive by Car.



of residential locations results from a combination of these soft attributes with superior accessibility to quality locations of the knowledge-based economy, to international transport infrastructure such as airports or high-speed railway stops and to top-end cultural facilities. Only a few urban centers turn out to be exceptionally attractive residential locations; apart from Zurich, St. Gallen, Bregenz, Chur and Friedrichshafen at best make it onto the map (as does Lindau, with certain reservations). We also notice that many of these attractive residential areas are situated in the closer catchment's area of Zurich. There are also alternative ways of commuting from locations outside the closer catchment's area of Zurich. For example, a commuter can get from Chur to Vaduz on public transport in

60 minutes and only have to change once. It only takes a further 15 minutes for the same potential commuter to get to Zurich in a comfortable express train, and without having to change once. Similar choices apply to residential areas on Lake Walen, in the Glarnerland and in St. Gallen.

This brief analysis of the competitive situation Liechtenstein finds itself in today for human capital reveals that the country's exceptional demand for regionally, supraregionally and internationally mobile qualified and high qualified manpower is pitted against a distinct competition for supraregional residential locations. In this competition the performance of Liechtenstein and its close neighbors in the Alpine Rhine Valley is distinctly below-average.

6 Indicators for Future Development – 18 Trends Determine the Mega Themes

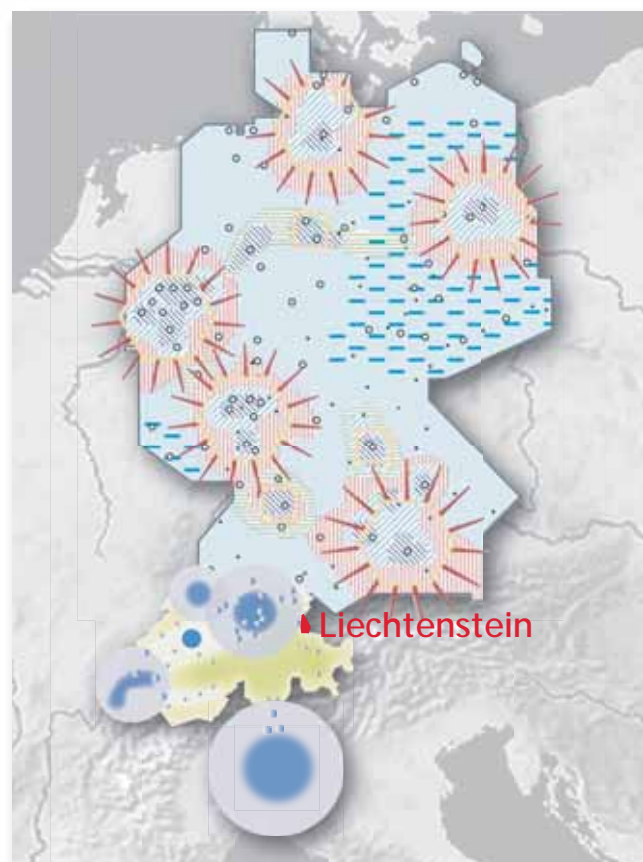
Our previous analysis has sketched a portrait of the Principality of Liechtenstein in the present day. By observing the small state in the context of international competition between locations we have been able to identify the essential factors determining prior strengths and weaknesses and future opportunities and risks in Liechtenstein's development. So how can we cast our gaze into Liechtenstein's future on the basis of the findings we have obtained until now? Every regional authority has an interest in assessing economic, social, cultural or ecological developments for the future. Outlooks and scenarios are available for individual municipalities, regions, cantons, regional states and nations. Our assertions regarding the future shall frequently be made independently of each other despite the considerable reciprocity that exists between them. Furthermore, such assertions often reveal the political and judgmental world of those who make them. In the case of Liechtenstein there is a clear distinction between the way the country is viewed from inside and from outside its borders. The available assertions made by Liechtenstein with regard to its development differ highly from those of the neighboring countries.

The outside view of trend scenarios for spatial development at European and national levels clearly point to polarization. Metropolitan regions in the European pentagon such as London or Paris will tend to gain in attractiveness. Though other areas are also set to grow, their growth rates are forecast to be clearly weaker when compared with the core European area (BBR 2003; ESPON 2007; ARE 2005). Cities with strong

growth rates such as Zurich, Stuttgart and Munich dominate this “highly polarized area” (ARE 2005: 71); the Principality of Liechtenstein is outside these “magnetic fields” (Figure 10). In the “competitiveness-oriented scenario” of Europe's spatial development through to the year 2030 Liechtenstein is not even in the “area of concentration of flows and activities” (ESPON 2007: 43).

A completely different perspective is offered by the population and employment forecast for Liechtenstein through to the year 2040 (Strittmatter 2003): This represents the view from the inside, as it were. If the population and employment situation continues to develop in line with the trends of the last 15 years then Liechtenstein can expect its population to grow by a clear 37 percent and the number of jobs to increase by 67 percent in comparison with the year 2005. There is also a second scenario: Strong growth through to 2040 could lead to 67 percent more jobs and 84 percent more population. In Figure 11 these figures are compared to the population forecasts which are available for the neighboring regions and the period of observation is uniformly extended to 2050. In surroundings displaying only moderate growth the Principality of Liechtenstein stands out as a solitary island of high growth. Depending on the particular scenario, its growth is forecasted to be from 48 percent to 96 percent. The signs for average population growth in Europe on the other hand are negative, particularly in the case of certain countries such as Italy or Germany. The compilation of growth rates on the map suggests that Liechtenstein can buck the trend and become an effective

Figure 10
 Liechtenstein's Position in the Trend Scenarios for the spatial Development of Germany and Switzerland.



We shall first briefly outline the trends. The general descriptions reveal developments which are for the most part true of most western European states. They sketch out general changes without making valued judgments on their political or social desirability. From this point of departure we go on to discuss the repercussions of each trend for Liechtenstein. The trends are then assessed with regard to their significance – from less significant to highly significant – and their impact – from predominantly negative to predominantly positive – on achieving the goals in 2068. In addition we explain the basic courses of action – active or passive, proactive or reactive – open to the Principality of Liechtenstein.

The Trend in Migration

International migration flows shall continue to increase. Given the declining birth rate, international migration is set to become an increasingly important factor in population development. The industrial countries of the west will also be among the primary destinations of future migration. A third of migratory movements across the world takes place within or towards Europe (Deutsche Bank Research 2002). International migration flows will probably become more differentiated and comprise both refugees from disaster areas as well as highly qualified global manpower. A look at the international competition for qualified and highly qualified manpower also reveals a global decline on the supply side in the numbers of skilled workers. Part of this development can be explained by the stagnation of or in certain cases decline in the size of the population and by the progressive aging in the demographic of the western industrial nations.

If we now extrapolate the previous increase of jobs and population for *Liechtenstein* through to the year 2068, then it becomes clear that the country cannot cover the forecasted growth rates through its internal resources or solely from today's commuter belt (Figure 11) (Strittmatter Partner AG 2003). The Principality depends substantially on skilled and highly skilled manpower moving to territorial or exterritorial Liechtenstein. Hence the growing mobility of people across the world can be regarded as a dominant and fundamentally positive trend for Liechtenstein's future. It signifies the quantitative enlargement of the pool of available manpower. The Principality enjoys more or less complete autonomy of action with regard to its immigration policy and can influence both the quantity and quality of foreigners moving to its territory. Liechtenstein needs to act with foresight at an early stage to keep up in the race for human capital in view of the trends which are starting to emerge – not least because its neighbors are unlikely to show much future interest in liberalizing their own immigration policies in order to provide Liechtenstein with the human capital it requires.

antipode to the attraction exerted by the neighboring magnets of Zurich, Stuttgart and Munich. How can this be accomplished?

To answer the question of whether and how the Principality of Liechtenstein can succeed in achieving the goals it has set itself for 2068 we need to carry out a systemic observation of the relevant levers of control in the four mega themes. We also need to understand each of the themes we shall be analyzing in terms of their interrelationships and the way they mutually influence each other. Based on research of the literature we have identified 18 trends with impact on the four mega themes of added value intensity, human capital, systems competition and availability of resources as discussed next (Figure 12) (Thierstein et al. 2007). The trends describe future challenges which are already foreseeable today if we extrapolate developments of the past.²

Figure 11
 Comparison of Population Forecasts for the Principality of Liechtenstein with those of its immediate and more distant Neighbors for the Year 2050.

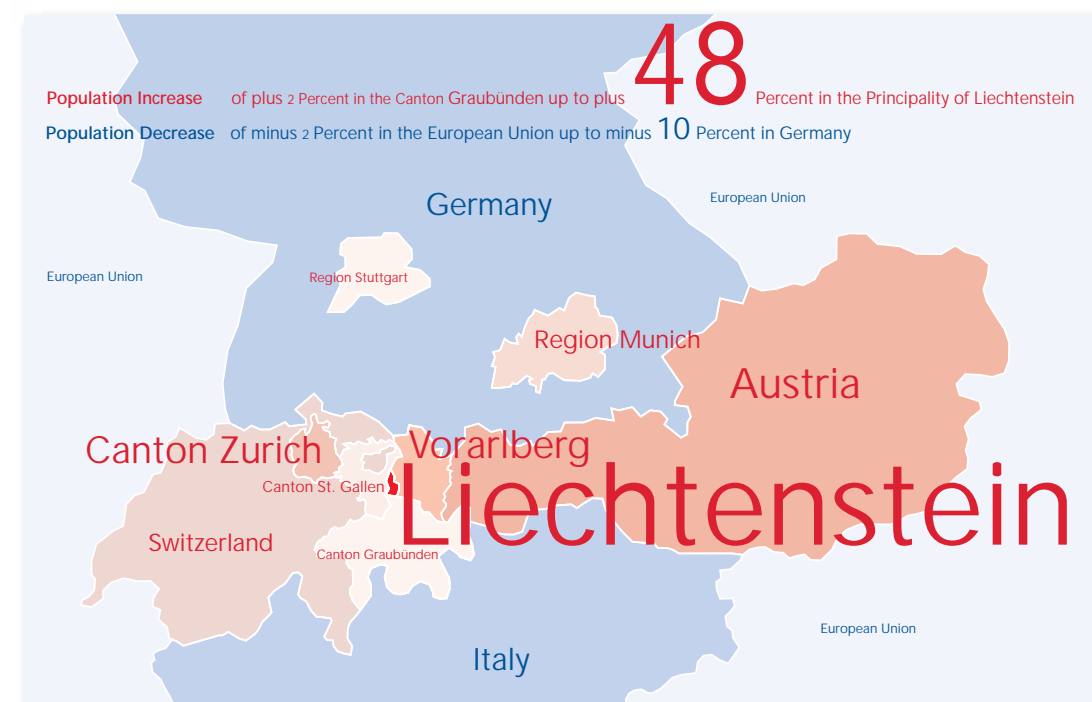


Figure 12
 18 long-term important Trends for the Future Development of the Principality of Liechtenstein and their Influence on the four Mega Themes.

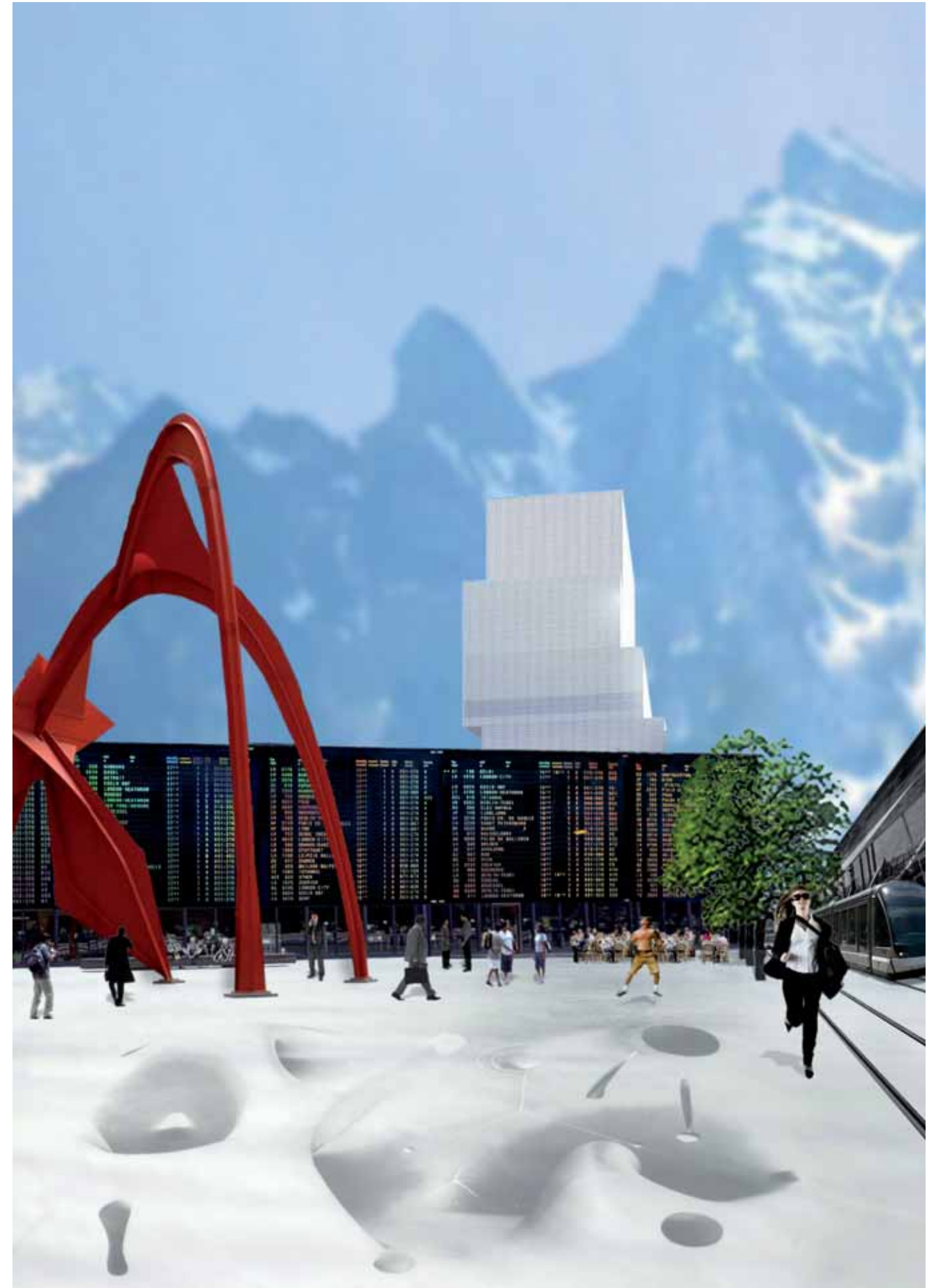
Value-Base Increase Economic Structure Knowledge-Based Economy	Labor Market	Human Capital Migration Lifestyles Age Distribution Gender Relations Temporal Structures Mobility
	Deregulation of Markets	Urban Attractiveness
European Integration Role of the Government and State	Budgetary Planning	Resources Climate Scarcity of Natural Resources Land Utilization Environmental Issues
System Competition		

City center.

City center

It is a few minutes before 9 o'clock on a Friday morning and the InterCity from Zurich has just arrived in Vaduz Central Station. Commuters get off the train and make their way towards the city center. Just like many of today's businessmen and day-trippers, these commuters benefit from the convenience of being able to reach Zurich Airport in an hour and the heart of Switzerland's biggest city in less than 45 minutes. Already two decades old, the train station has indeed turned out to be the kind of visionary "grand project" that the government of the Principality of Liechtenstein had intended upon its inauguration. At the time, the planning of the new European high-speed rail link from Zurich to Munich offered a unique opportunity to redirect the route through the Rhine Valley, thereby enabling a rapid transport link from Liechtenstein to outlying and prosperous economic areas. This had been an insistent demand of developers at the time with an eye towards the potential for developing business opportunities in the Alpine Rhine Valley.

Anyone wishing to grasp the significance of Vaduz Central Station solely on the basis of the fact that it brought the most important economic regions in Central Europe perceptibly closer together would be overlooking its other notable merits. Its pioneering architecture and integration into the urban fabric make it one of the key elements of the new city center of Vaduz. A stroll through today's city center immediately reveals why the Schaan-Vaduz-Triesen area is known as the "Heart of the Alpine Rhine Valley". Its shops, cultural establishments and residential streets with their sidewalk cafés beg to be explored as one wanders through the city. Such qualities showcase the amazing changes that Liechtenstein has skillfully, and with impressive consistency, promoted over the last decades. Where traffic once frequently came to a virtual standstill on the old Landstrasse, and a couple of tourists strayed through the streets of the Städtle, there is now a delightful succession of paths and squares linking the area around the station to the splendid political and cultural buildings, steeped in tradition, at the foot of the Schlossberg. From there, the financial center of the Herrengasse is only a few steps away. Its striking and architecturally incisive buildings are among the most conspicuous insignia of the new city center. Venues for the local community are interspersed with locations of commercial activity. The new city center represents a distillation of those features that have been instrumental in contributing to Liechtenstein's success as a model of urban development.



The Trend in Lifestyles

Individualization remains a significant process in the transformation of lifestyles. The number of different lifestyles is increasing; society is becoming ever more diverse. The growing number of choices facing the consumer in every field of life is leading to a differentiation in the way demand is structured. The pluralisation of lifestyles is expressed in new temporally and spatially flexible forms of family life, relationships, work and living conditions at home. Lifestyles matched to individual requirements, multi-optionality and flexibility of the individual's life plans and visions are becoming increasingly important³. In certain sectors of society, however, the process of individualization is also accompanied by growing uncertainties.

Liechtenstein's attractiveness as a place to live and work should be seen from the perspective of lifestyles that will continue to grow ever more distinct in the future. The conscious decision to choose the way of life that suits the individual, the consequent awareness that alternative choices exist and enhanced power on the demand side exacerbate the competition between locations for human capital. Consequently, Liechtenstein has to be as forward-looking as possible in meeting the increasingly demanding requirements of certain lifestyles of the target groups it wishes to attract: It has to be an attractive place to work and live in, and offer attractive leisure opportunities. At the same time the smallness of the country and its location in the Alpine Rhine Valley restricts its ability to offer multi-optionality and flexibility of the individual's life plans and visions compared with its rival locations.

The Trend in Age Distribution

Older people will account for an increasingly larger proportion of the social demographic. While global population continues to rise, it is also falling in many industrial countries – particularly in Europe and Japan. Population growth rates in Western Europe are set to decline over the next decades. Demographic aging continues to accelerate due to the increase in life expectancy and as a result of current age distribution. The coming decades will witness an ever more rapidly growing number of senior citizens. The trend towards the increased demographic aging of the population is set to impact on work and consumer behavior within society. Demand for living area per capita continues to increase even though the birth rate remains at a low level. The trend towards smaller families, more childless couples, more single persons and hence to more one- and two-person households will continue.

Consequently, demographic development is set to inhibit forecasts of manpower and population growth in Liechtenstein at local, regional and supraregional levels (Strittmatter Partner AG 2003). Age distribution is an important factor if the goals set for 2068 are to be

achieved. Left to its own resources, the Principality of Liechtenstein is not in a position to attain them. As it stands, demographic development must be regarded as an inhibitory factor in view of the emerging demand for skilled manpower in Liechtenstein.

The Trend in Urban Attractiveness

The urban environment is increasingly becoming a preferred residential environment. In 2007, for the first time in human history, more people lived in towns and cities than they did in the countryside. People are looking for the kind of diversity, stimulation and culture required for the creative knowledge process to take place. Urban environments are liberal, individualistic and heavily permeated with culture. Reurbanisation is becoming an increasingly powerful force, both in the core towns and cities as well as the immediate border regions, along the lines of "the urban can also be found in the rural".

Today's Principality of Liechtenstein displays little urban attractiveness. It can neither keep up with great urban centers such as Zurich, Stuttgart or Munich, nor does it offer the urban attributes of small centers such as St. Gallen, Bregenz or Chur. Furthermore, Liechtenstein cannot be regarded as a complementary location or "suburb" of that kind of urban center. The question of urban attractiveness is set to be an increasingly dominant factor in the choice of places to live and work in the future. This does not merely concern preferences regarding certain lifestyles. A critical mass, i.e. a sufficient density of population, functions, building development and, ultimately, exchange and encounter, exerts a decisive influence on opportunities for the generation and exchange of knowledge, for innovation and for a location being provided with the infrastructure it requires. As a result, potential accessibility, public services and culture also become subject to change and transformation. Smallness, however, also means room for maneuver in comparison with the inertia and complexity of large towns or cities. By 2068 most of Liechtenstein's buildings will have been replaced in accordance with the standard life cycle of structures. Liechtenstein must not leave this gradual and continuous process of transformation to chance if it wishes to achieve the goals it has set itself for 2068. The determination to pursue a forward-looking, strategic course of action over a period of 60 years can produce clearly visible and perceptible results.

The Trend in Gender Relations

The difference in gender relations is set to become more distinct. As experienced in real terms, the gender differences between men and women which can vary widely depending on affiliation to a particular social class or milieu are undergoing a pronounced process of change. Gender equality appears to be ad-

vancing, stagnating or receding depending on the particular aspect under consideration. An important mainspring for improving the status of women over the past 30 years was education. This pivotal resource has undergone accelerated growth among women, with a consequent effect on women's quality of life and their integration into the employment market. It has certainly contributed to a rejection of traditional ideals in terms of "partnership" and "family". The overall picture we appear to get is somewhat contradictory in nature. Levels of female employment start to play a central role for *Liechtenstein* in particular as soon as skilled and highly skilled workers start to become a scarce resource in the world. Striking an acceptable work-life balance for women and men is not just an important precondition for raising the number of women in gainful employment – it also has spatial repercussions. Studies indicate that commuter behavior differs between men and women (BBR 2007). Spatial proximity between the home and the workplace play a more important role for women: On average they prefer less protracted commuting times. Different preferred lifestyles and role models are linked to different patterns of settlement today (Leuthold 2008). If Liechtenstein intends to exploit the potential of well educated and trained women, then it has to meet their specific requirements in terms of the spatial organization of housing, employment, childcare, leisure and provide the necessary infrastructure. Under these circumstances, the validity of models of life as envisioned by the commuter of today is somewhat questionable.

The Trend in Temporal Structures

Temporal structures are becoming increasingly flexible. The classic models of daily, weekly or life structures are beginning to disappear. Greater flexibility is as much a social desirability as it is an obligation imposed by the system.

The trend towards more flexibility of temporal structures also poses challenges to the way Liechtenstein's space will be organized in the future. Different temporal sequences, for example, regarding family time, working time and free time correspond to different areas and geographical locations. The distances between them have to be covered not just twice but several times a day in this case. A higher degree of flexibility of temporal structures in working and private life impinges on the attractiveness of life for people commuting daily to Liechtenstein. In the competition between locations for human capital there is a growing demand for such different temporal rhythms to be reconciliated on the demand side. The less concentrated spatial structures within Liechtenstein and the outsourcing of residential locations for many employees beyond the country's borders turn out to be adverse factors in this case.

The Trend in The Economic Structure

Dynamic economic growth starts from industries with a bright future. Economic structural change is continuing with a "tertiarization" of added value. The impetus for steady and moderate economic growth chiefly comes from hi-tech industries with pronounced innovative and value-added capability such as the life sciences, information technology, nanotechnology, micro technology and advanced producer services (firms). In a globalized world with deregulated trade structures and low transport costs high-wage countries can only keep their company locations within their borders if outsourcing value-added steps – such as manufacturing – to countries with lower wage costs is not worthwhile because of certain obstacles. Domestic locations start to become competitive, for example, if the home country is the only place to achieve high quality of goods and services or features temporary though virtually unique points of differentiation.

Liechtenstein enjoys a relatively good starting position with regard to its economic situation. It has industries with strong growth rates in the knowledge-based economy which appear likely to withstand global competition in the medium term. However the long term future of all value-added steps in hi-tech manufacturing based in Liechtenstein has yet to be secured. Liechtenstein's array of industries is now sufficiently diversified to the extent that we can talk of a distribution of risk. The three most important industries in this regard are machine and vehicle manufacturing, electrical engineering and banking (Eisenhut 2004). By establishing favorable business conditions – e.g. by investing in education and training infrastructure and securing accessibility, etc. – Liechtenstein can exert a decisive influence on its attractiveness as a location for companies. This room for maneuver with regard to competitiveness manifests itself in different ways for the hi-tech companies and financial services providers. Hence the financial center of Liechtenstein can offer niche products with USPs through its innovative regulatory solutions. For goods and services in the hi-tech industries, on the other hand, it is far more difficult to generate such competitive advantages.

The Trend in the Knowledge-based Economy

Knowledge is the central resource of the economy. The systematic use of scientifically-based knowledge in value-added processes is increasingly becoming a strategic competitive factor for companies and hence for locations. The activities of financial organizations and service providers, hi-tech and life science manufacturers as well as tertiary education institutes are also becoming highly important. A corollary of this is the growing concentration of highly qualified manpower in knowledge centers.

The trend towards the knowledge-based economy exerts a powerful influence on *Liechtenstein's* opportunities and risks in achieving the goals which have been set for 2068. Here the smallness of the country and its relatively peripheral location might turn out to be a decisive disadvantage. The reciprocal effects which knowledge-intensive processes have on spatial arrangements and structures are factors which are set to put Liechtenstein under increasing pressure as a location. Vital spatial conditions and requirements for the knowledge-based economy include the gaining of sufficiently critical mass as a sine qua non for adequate density of interaction and international accessibility. After all, the ability to establish face-to-face contacts is of primary importance for the exchange and generation of know-ledge, both with a given location at local and regional level as well as between different European and global networks. Areas lacking a sufficient number of people or opportunities are also unable to operate the kind of cost-efficient infrastructure which would enable them to achieve good supraregional accessibility.

The Trend in the Deregulation of Markets

The increasing deregulation of markets for goods and services will put further competitive pressure on companies operating in international markets. The deregulation of world trade and of the markets will continue to advance both in Europe with the European Single Market and at global level with the World Trade Organization. To a much greater extent than has previously been the case, companies shall be taking an international perspective to organize their value-added chains. International companies will increasingly be able to exploit the advantages of their respective sites which will further exacerbate competition between locations in metropolitan areas.

Liechtenstein's chances of achieving the goals which it has set itself for 2068 will be only slightly affected by the trend towards market deregulation. Increasingly tougher competition between locations is a general, external condition which applies both to the Principality of Liechtenstein as well as its competitors. We assume that the present balancing act between the state's autonomous freedom to act and the need to integrate Liechtenstein shall also remain a requirement and a possibility in the future. To this end a constant series of further developments and adjustments are necessary in a dynamic environment.

The Trend in the Labor Market

More flexibility of the labor market requires new forms of work. The signs are that the future development of the labor market is likely to experience further increases in flexibility and segmentation. The days of a full-time job for life will no longer prevail. New forms of work such as telecommuting and working time models

open up additional opportunities for the workforce and for companies. The flexibility of the labor market has also created new risks for part of the workforce since it also leads to an increased number of employment positions with little job security, to part-time work and to temporary contracts. The workforce is responding to this with strategies aimed at minimizing such risks. In this regard the diversity and number of jobs available in the places where people actually live plays a decisive role. A broad array of diverse labor market opportunities in the urban centers and their surroundings helps to reduce worries for individuals in the case of structural change and the threat of unemployment in certain sectors of industry.

If we now look at the dominant sectors of industry in Liechtenstein, i.e. hi-tech and advanced producer services (firms), we notice that these two labor markets differ in their spatial outreach. For hi-tech industries the Alpine Rhine Valley represents a regional labor market which remains set to offer sufficient diversity and depth in the interplay between different locations and companies. Things start to become critical when we examine the situation with regard to highly qualified managers. In the field of financial services and insurance companies the availability of jobs is restricted to the Principality of Liechtenstein. The diversity and depth of this labor market is far weaker. Furthermore, difficulties in the labor market are exacerbated by the strategy of specialization, which is necessary for companies engaged in international competition. The limited extent and differentiation of the employment market not only represents a disadvantage for the individual employee in terms of his need to take precautions against risks: There is also his partner and family to be taken into consideration. Although the jobs on offer in Liechtenstein are of high quality, the Principality's labor market is small and specialized in comparison to the neighboring metropolitan areas, so that it is increasingly coming under pressure in the competition for human capital.

The Trend in Climate

The average global temperature is increasing. Climate change is occurring as a result of the emission of greenhouse gases. Average global temperature increased by 0.6°C in the 20th century. In the absence of clear counter-measures forecasts of global warming assume an average increase of two to three degrees in temperature over the next 50 years. Climate change has a worldwide impact on very many different areas, such as the increase in extremely adverse meteorological events including floods, mudslides or tropical storms as well as rising sea levels and water shortages through periods of drought and less melt water. Forms of land usage are also undergoing severe change, together with their related added value. Climate change affects *Liechtenstein's* spatial possibilities of

development. Climate change forecasts for Central Europe indicate specific impacts on certain kinds of area (IPCC 2007: 565). Liechtenstein's valley floor will probably witness far more flooding events, its mountains far less snowfall and the increased hazard of avalanches and mudslides. In most of its Alpine locations the opportunity to practice winter sports will be scarcely possible with any reliability in 2068. Agriculture and forestry will have to explore alternative forms of husbandry and management. The immediate impact of climate change on the location of Liechtenstein will not be excessively powerful in comparison with its competitors. In the small state, however, the preventive and adjusting measures required will tie up an exceptional amount of capital. In particular extremely high costs of adjustment are expected for the period after 2050 if the 'business as usual' scenario actually occurs with a dramatic increase in temperature. The almost complete exchange of Liechtenstein's inventory of buildings by 2068 offers plenty of opportunity to upgrade infrastructure and buildings in such a way that they allow for the impact of climate change. From a temporal point of view, this restructuring requirement runs parallel to the scenario horizon. Because Liechtenstein today only exhibits a relatively small amount of built environments, it is in a good position to implement sustainable urban and structural forms through forward-looking courses of action on its own territory. Flood protection measures for the Alpenrhein river can only be achieved through joint efforts with the neighboring states, however. This places special demands on Liechtenstein's exterritorial engagement.

The Trend in Natural Resources

The scarcity of natural resources will lead to higher energy and raw material costs. Natural resources are becoming increasingly scarce due to the rapidly growing demand of the giant emerging economies of India and China for energy and raw materials. Together with the continually growing levels of energy consumption in Europe this will lead to shortages on the international commodity markets, even though renewable energy sources will have a greater market share. According to a study of the International Atomic Energy Agency (IAEA) the world will require over 50 percent more primary energy in 2030 than it does today (Steinmüller and Steinmüller 2006). The growing demand for energy will be accompanied by increased pressure for greater energy efficiency.

Initially, the growing shortage of natural resources and attendant rising prices have very much the same impact on Liechtenstein as they do on its competitors in the global market for energy and raw materials. Although, the small state depends almost completely on imports of energy and raw materials, it is only a small, almost negligible customer on the global market with

exacerbated demand. Hence the creation and development of strategic alliances is of decisive importance for securing access to natural resources. Furthermore, rising energy costs will impact on future patterns of mobility. The economic location of Liechtenstein is heavily dependent on commuter mobility. Daily commuting across large distances by car is set to become a less attractive proposition in the future. The country's potential commuter belt will shrink as the previous life and work model of the cross-border commuter is called into question.

The Trend in Mobility

Mobility requirements and options will continue to increase. Current forecasts point to clear growth in the transport sector despite rising energy costs. The basic scenario for Switzerland indicates 27% growth by 2030 and up to 60% growth in Liechtenstein by 2040 (ARE and UVEK 2006). The population as a whole is becoming increasingly mobile, even though the trend varies in the case of different age groups or social groups. The bulk of the expansion is set to occur in private transport, which accounts for most of the sector and displays high rates of growth. Despite a spread of technology in traffic control, traffic problems will become increasingly exacerbated with CO₂ emissions continuing to rise. Integration into efficient transportation networks at international, national and regional level is becoming a pivotal competitive factor (ESPON 2006).

At the moment, Liechtenstein is heavily dependent on the ability and willingness of foreign workers to embrace mobility and commute daily by car across the border. At regional and local levels the marked increase in motorized individual transport forecast is set to impair quality of life in the Alpine Rhine Valley. Liechtenstein's regional and supraregional accessibility by public transport is relatively poor. In the international competition between locations for qualified and highly qualified manpower Liechtenstein's relative accessibility already constitutes a clear competitive disadvantage today. Competing economic centers with more central locations in regard to international network infrastructure such as international airports, transnational high speed rail links or motorways will also benefit more in the future from the trend towards increased mobility options than Liechtenstein in its peripheral location. The competitive disadvantages of the country threaten to become more exacerbated.

At local level the Principality of Liechtenstein may be able to establish a relatively independent network of public transport based on its own requirements. But in order for it to work effectively it has to be integrated into a super ordinate, efficient transportation network. Here the lack of synergies in the region forms a considerable barrier. Liechtenstein will only succeed in improving its accessibility through greater exterritorial engagement.

The Trend in Land Utilization

Utilization of the land will become more intensive. Splinter development in the countryside and urban sprawl on the edges of towns will continue. The extensive conversion of open rural spaces into land for development and transport routes shows no signs of stopping. The reasons for the growth of settlement areas and transport networks can be found particularly in the socio-economic and demographic change which is leading to a growing demand for housing area per capita and to an increase in single households as well as in the growing requirements for mobility. The competition for land utilization has received an added dimension with the transformation of the landscape through energy production. The desire to live in the immediate vicinity of rural and recreational areas while being able to work and shop in the city will also continue to remain for many people in the future. Consequently, settlements will continue to grow mainly on the edges of conurbations and between urban centers within densely populated areas. Shopping and leisure facilities as well as manufacturing companies requiring large areas will continue to settle chiefly in the readily accessible peripheries of the agglomerations.

Liechtenstein has hardly any opportunity to influence the control of land utilization at regional level. We can assume that the splinter development of the Alpine Rhine Valley is set to continue. The situation Liechtenstein faces is scarcely any different to that of its rivals in the supraregional and international competition between locations. On the other hand, however, Liechtenstein can be relatively autonomous in controlling the quantity and quality of land utilization on its own territory. Consequently, it may be possible for the Principality to generate a morphological and functional difference to its neighbors. Since settlement structures can only be changed in the long term and any decisions taken today will have long-lasting repercussions, action must be taken at an early stage to achieve positive effects for 2068.

The Trend in the Environmental Issues

The manifold utilization of natural resources is set to increase. The goal of sustainable development is based on an absolute disconnect between growth and the use of resources: But as experiences across the world have shown over the past 30 years, this sort of disconnect has only been achieved in very few environmental fields (BUWAL 2005). The natural resources of climate, soil, materials, air and water are subject to growing levels of utilization as a result of growth in the global economy.

For Liechtenstein the resources of nature and the landscape represent a significant location factor. While it is true that Liechtenstein's rural attributes are somewhat average in the supraregional competition for qualified

and highly qualified manpower when compared to the exclusive lakes or mountainsides in the more distant surroundings (Figure 9), the spatial proximity and immediate availability of nature and the landscape in the interplay with other uses such as housing and work represents a potential advantage to rival locations such as Zurich or Munich. The development of a specific relationship to nature and the landscape is one way of compensating for Liechtenstein's lack of urban attractiveness, at least in part. Moreover, the mental and actual relationship to nature is part of the country's cultural heritage and should be regarded as a component of its identity. On the other hand Liechtenstein's natural surroundings and landscape are embedded in the cross-border context of the Alpine Rhine Valley. They need to be viewed as regional resources. Hence increasing land utilization in the Alpine Rhine Valley and in Liechtenstein poses a danger for the future positioning of the Principality in the competition between locations. Although Liechtenstein's autonomy of action enables it to counter this trend at local level, it only has limited opportunities at regional level to exert any influence. Exterritorial action is required to secure the cross-border attributes of nature and the landscape.

The Trend in European Integration

Standardized European regulations are starting to supersede certain fields of policy in national legislatures. Despite setbacks and resistance the level of European policy is growing in importance. The European community of states will have to step up all its joint activities if it is to assert itself in the competition between the global power blocs.

The trend towards ever closer European integration has little bearing on Liechtenstein's perspectives of achieving its goals in 2068. The harmonization of the European Union will eventually reach its limit. The intended advantages of harmonization are countered by unintended disadvantages. Small states can help to ensure a minimal competition between systems within Europe which would be of mutual benefit. As islands of attraction they offer nuances which support Europe's positioning in the international competition between locations. The goodwill of the large states of the European Union will go as far as accepting "tax havens" in their "backyard" but not as far as condoning illegal business transactions. Consequently, the role of Liechtenstein in Europe is not set to change that much.

The Trend in Budgetary Planning

The public sector's financial room for maneuver is in decline. A number of different aspects are responsible for this. Financial shortfalls in public sector budgets at central and sub-state level are becoming more exacerbated. The increasing level of public debt and growing pressure on areas of public spending is forcing govern-

ments towards the targeted use of funds in their priority tasks. The global mobility of capital is leading to a fall in the number of options to generate state revenues and to falling value added surpluses in the national economies of the west.

On the one hand Liechtenstein enjoys extensive autonomy with regard to its budgetary planning in comparison with its competitors. Rival locations such as the metropolitan regions of northern Switzerland, Stuttgart or Munich are affected by an array of communal, regional or even federal border situations so their ultimate decision-making powers as authorities are correspondingly weak. In contrast, the location of Liechtenstein exhibits an exceptionally high demand for capital investment. On the one hand the small state lacks positive economies of scale when it comes to investments in public services and infrastructure, etc. On the other, Liechtenstein has to invest over-proportionally in its location attributes to maintain its position in the increasing competition between locations due to its relative smallness and peripheral geographic situation. Since fiscal policy is an essential component in systems competition there are only limited opportunities to raise public revenue without incurring considerable competitive disadvantages.

The Trend in the Role of the Government and State

The ensuring state will increasingly replace the supply state. Hence the state will assume completely new tasks as a "moderator, organizer and catalyst". In the face of growing competitive pressures the efficiency of the public sector in the provision and delivery services is becoming extremely important. Public and state controlled companies are increasingly coming under fire. The trend towards the extensive privatization of state tasks and companies is set to continue. In this case future-oriented forms of financing will ensure state influence while the organizations themselves will operate according to private sector criteria ("Zukunft Bayern 2020" review group 2007).

For the small state of Liechtenstein the role of the government and state is a highly important lever for asserting itself in the international competition between locations. The necessary balance of autonomy and integration must be constantly redefined. The aim here is to exploit the potential advantages of the autonomous small state in as many different fields as possible. In addition to establishing basic legal and financial conditions for companies and employees it can also try to differentiate in the fields of migration, urban attractiveness or land utilization. The business location of Liechtenstein is not limited however to its own territory. The small state has to seek cooperation partners and strategic alliances at regional and supraregional levels in the Alpine Rhine Valley and in Europe, so it can also act exterritorialy.

7 Reciprocal Effects, Levers of Control and Fields of Action

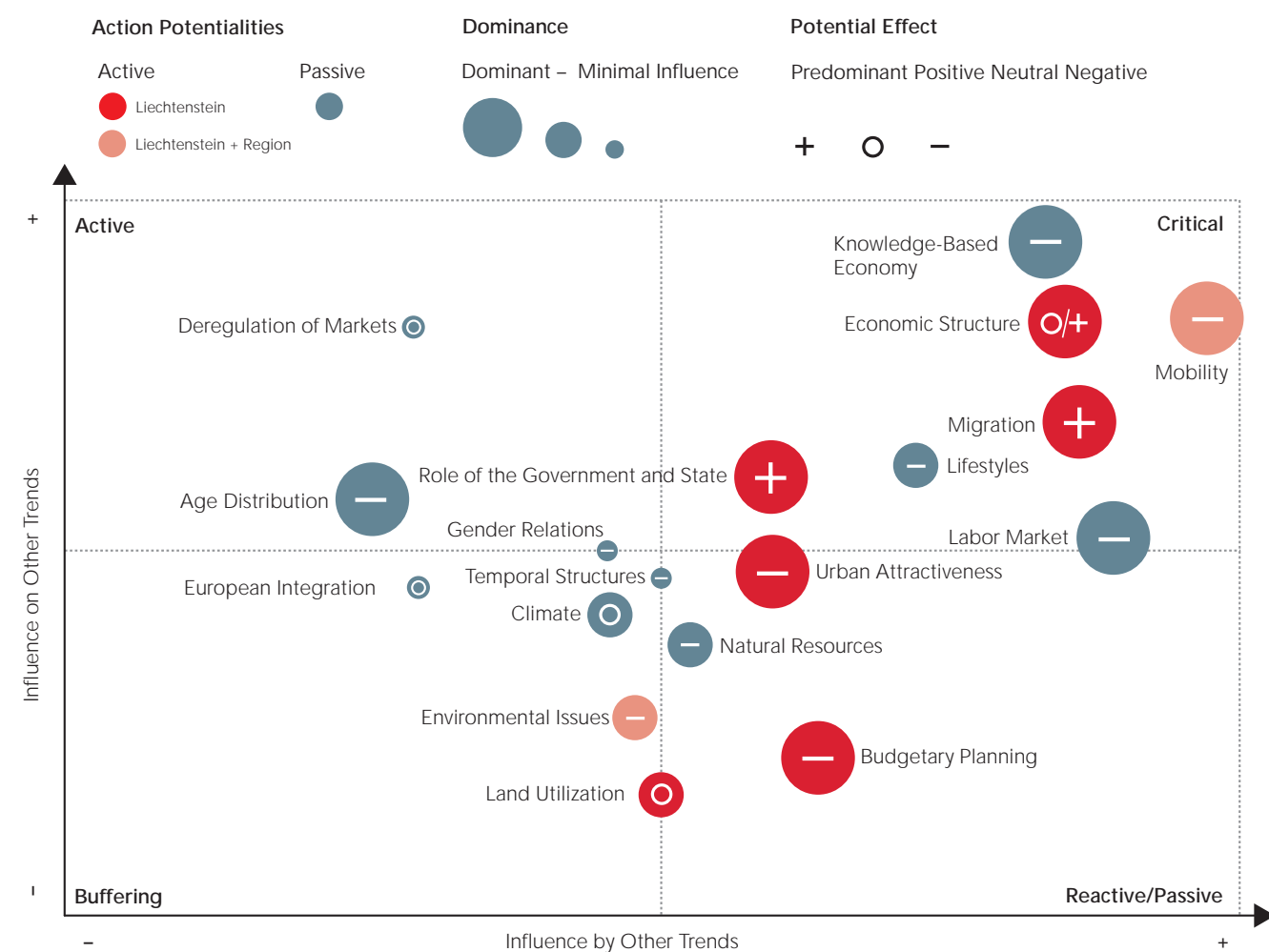
How can the Principality of Liechtenstein achieve its goals for 2068? The previous review of the 18 trends provides us with clues to their importance and likely effect, and reflects options for action in an initial step. Are we already able to detect levers of control for the future from the many findings we now have available? To answer this question we have to supplement the isolated analysis of individual trends with an overall observation of the system as described in section 4 with respect to competition between locations. We notice the establishment of cycles with negative and positive feedback. Using Frederic Vester's model of the paper computer (Vester 2002) we can estimate the strength of active and passive influence for each individual trend (Figure 13). The figure illustrates the reciprocal effect of the trends under investigation for Liechtenstein with regard to the country's ability to achieve the goals it has set itself for 2068. This step is necessary in order to elaborate and, at a later stage, align the influence of the trends to the mega themes we have already identified.

Given the position of the different trends regarding their active or passive nature we can now characterize their role in the overall system.

- Active trends have a strong influence of other trends and are influenced only minimally by the latter.
- Critical trends are heavily influenced by other trends and, in turn, exert an equally strong influence on the latter.
- Reactive elements are heavily influenced by other trends and only have a minimal influence on the latter.
- Buffering trends only exert a minimal influence on other trends and, in turn, are influenced only minimally by the latter.

Reciprocal effects are significant with regard to political intervention. Without a sound knowledge of the overall systemic context, isolated measures soon run "out of control" and have non-intended effects in other

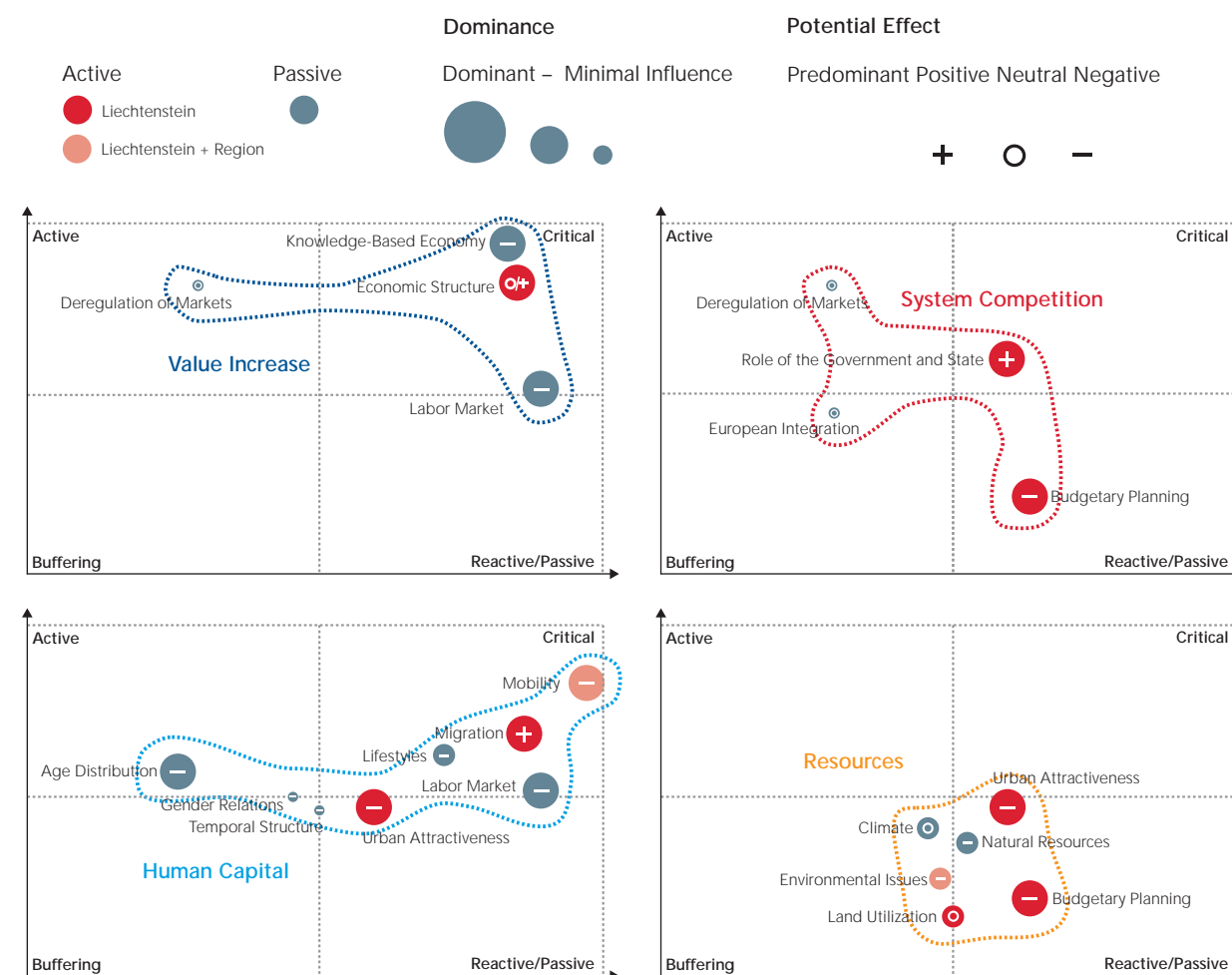
Figure 13
Review of Trends with Regard to reaching Liechtenstein's own Goals for 2068: Reciprocal Effect, potential Effect, Dominance and Options for Action in the Principality.



fields of policy. *Active variables*, such as the deregulation of markets for example, constitute the actual levers of control in the system. Yet there is little scope for influencing them directly. The *critical elements* can catalyze and accelerate processes. Because of the various ways they are interconnected within the system changes can have a rapid and extensive impact on all kinds of fields. Interventions in such fields can therefore have a great impact but due to their high degree of interconnectivity also carry considerable risks. *Passive variables* can serve as indicators of changes due to their high degree of passiveness. They are the final links in a functional chain. An intervention at these points is therefore little more than an attempt to combat various symptoms without dealing with their root causes. *Buffering variables* on the other hand serve to

stabilize the system. Political interventions only display a few “side effects” due to their relative isolation. The evaluation of the trends with respect to their reciprocal effects is complemented in Figure 13 by findings concerning the dominance, options for action and impact of the individual trends for the scenarios in 2068. Large dots signify particularly influential trends for reaching the goals set for 2068; small dots on the other hand play only a minor role. The trends highlighted in red are those on which the small state of Liechtenstein can actively influence to a large degree by itself. Trends marked in light red can only be influenced extraterritorially, i.e. at least at the level of the Alpine Rhine Valley. Grey means that these trends lie outside the Principality's scope of influence. It can only respond passively to them. Positive means that the trend appears strongly

Figure 14
Reciprocal Effect of the Trends based on Mega Themes.



to support the achieving of the goals. Negative means that a trend hinders the achieving of the goals unless its predominantly negative impact is faced with active options for action by the Principality of Liechtenstein which can compensate for the negative trend. Negative trends without any options for action by the Principality have to be offset by other themes. The review of the trends in Figure 13 clearly shows that the Principality of Liechtenstein faces strong headwinds in its attempt to achieve its goals for 2068. The clear majority of future trends are negative. In many fields of action the Principality is more obliged than other states to compensate for the small size of its territory and its relatively peripheral location. On the other hand we also note that Liechtenstein is also in full possession of important levers of control and can

be pro-active in a number of important fields. These, however, are subject to complex reciprocal effects so they require a far-sighted and completely integrated and coordinated course of action if the positive effects intended are not swiftly to develop unintended side effects. If we now use the system outlined in Figure 12 to subsume the 18 trends under the mega themes of value-added intensity, human capital, systems competition and resources then we also notice clear differences between each theme with regard to significance, the ability to influence them and their reciprocal effects (Figure 14).

A study of the reciprocal effects of the trends on the four mega themes reveals the following:

- *Value-added intensity* is influenced by particularly active and critical trends. Yet the only field open to pro-active courses of action here is the predominantly positive trend displayed in the structure of the economy with its pronounced room for maneuver, for example, in the field of financial services. In contrast, trends in the knowledge-based economy and on the employment market appear negative and offer less scope for pro-active courses of action.
- The mega theme *human capital* is of vital importance for the future. It combines exceptionally active with critical and very dominant trends. With the exception of migration, all the trends appear negative and initially seem to stand in the way of Liechtenstein achieving the goals it has set itself for 2068. On the other hand, however, three dominant trends offer scope for change through strategic action: Mobility, migration and urban attractiveness.
- Future questions of *systems competition* are determined by two dominant trends. The role of the state is set to remain a vitally important lever for Liechtenstein's positioning in the international competition between locations. In contrast, however, the budgetary disadvantages of the small state are clearly evident.
- Within the *resources* mega theme the Principality of Liechtenstein possesses a number of options despite certain dependencies in the field of natural resources. That said, the trends are clearly passive on average and therefore unsuitable as primary levers of control for the future. The most active role is played by the dominant trend of urban attractiveness, which simultaneously impacts on the mega theme of human capital. All trends tend to indicate a negative effect on future development. Here, too, the disadvantages of the smallness of Liechtenstein in comparison with its competitors in the international competition between locations come to the fore.

The overall picture indicates that all four mega themes offer potential for the Principality of Liechtenstein to take action in furthering its goals for 2068. In this regard the question of human capital plays a key role in deciding Liechtenstein's future. It combines three particular dominant, active and critical and at the same time influenceable future trends: Mobility, migration and urban attractiveness.

The Principality of Liechtenstein's future fields of action can be viewed in three dimensions: Planning opportunities are available at institutional, functional and morphological levels (Figure 15).

The functional fields of action, i.e. economic structure and mobility, are particularly critical, followed by the institutional challenges of migration and the roles of the state. In contrast, scope for morphological change tends to play a more passive and, in part, merely buffering role. The three fields of action, however, are closely interrelated with each other. In Figure 16 this interplay is examined more precisely for most active trends in each field of action. The trends underpinning mobility, migration and urban attractiveness illustrate the same close interplay between functional, institutional and morphological options for action. In this regard the functional question of mobility in particular is extremely closely linked to challenges posed by the built environment and by settlement and the landscape. The future trend in urban attractiveness on the other hand is actively and reactively related to functional fields of action such as mobility and the economic structure as well as to the institutional sphere of migration.

Our previous analysis indicates that Liechtenstein's functional, institutional and morphological options for action are closely interconnected. Consequently, and with some skill, we may be able to combine individual impact relationships with each other in order to develop an integrated strategy for action in shaping Liechtenstein's future. The pooling of individual, active options for intervention can then offset other less influenceable negative trends. But before outlining the basic conditions required to achieve the goals set for 2068 in the Metamorphosis 100 scenario we shall consider the situation which might occur in the event that Liechtenstein decides to adopt a policy of small, "not joined up" steps in the fields of the economy, society, spatial development and mobility. We describe this strategy as Metamorphosis 50.

Figure 15
Review of Future Trends based on Liechtenstein's Institutional, Functional and Morphological Fields of Action.

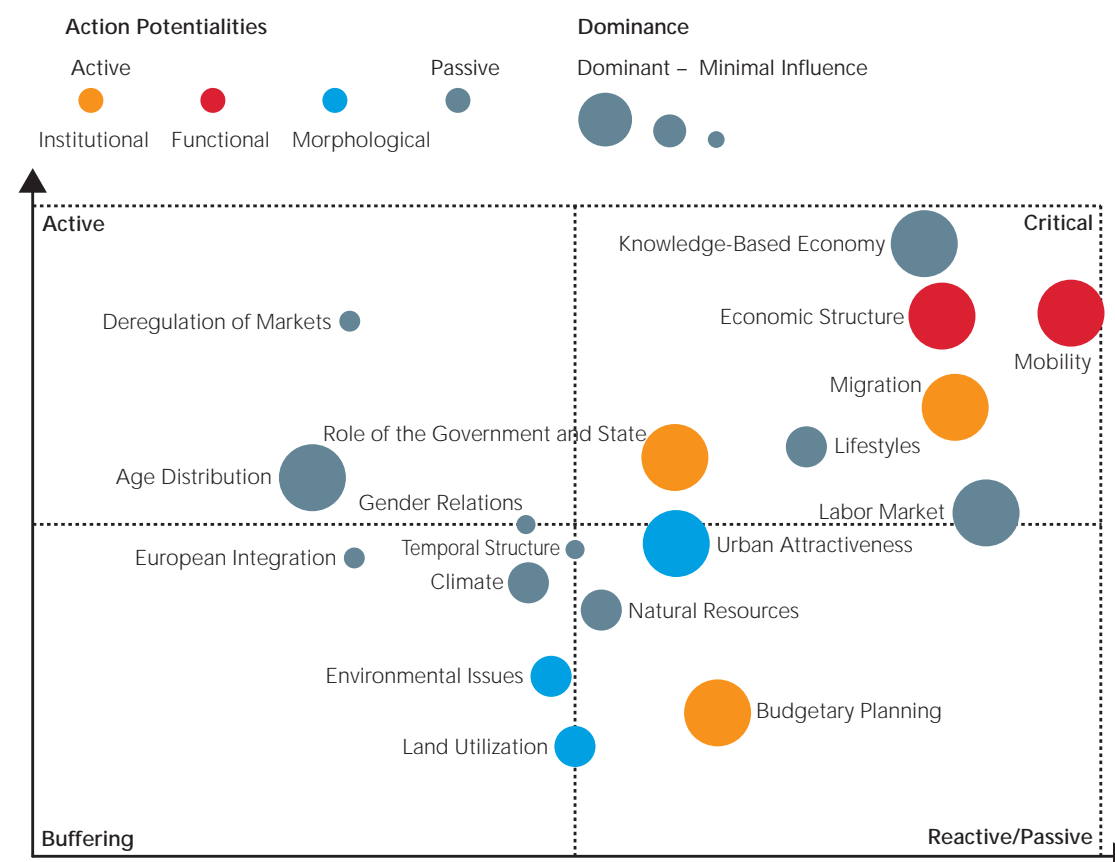
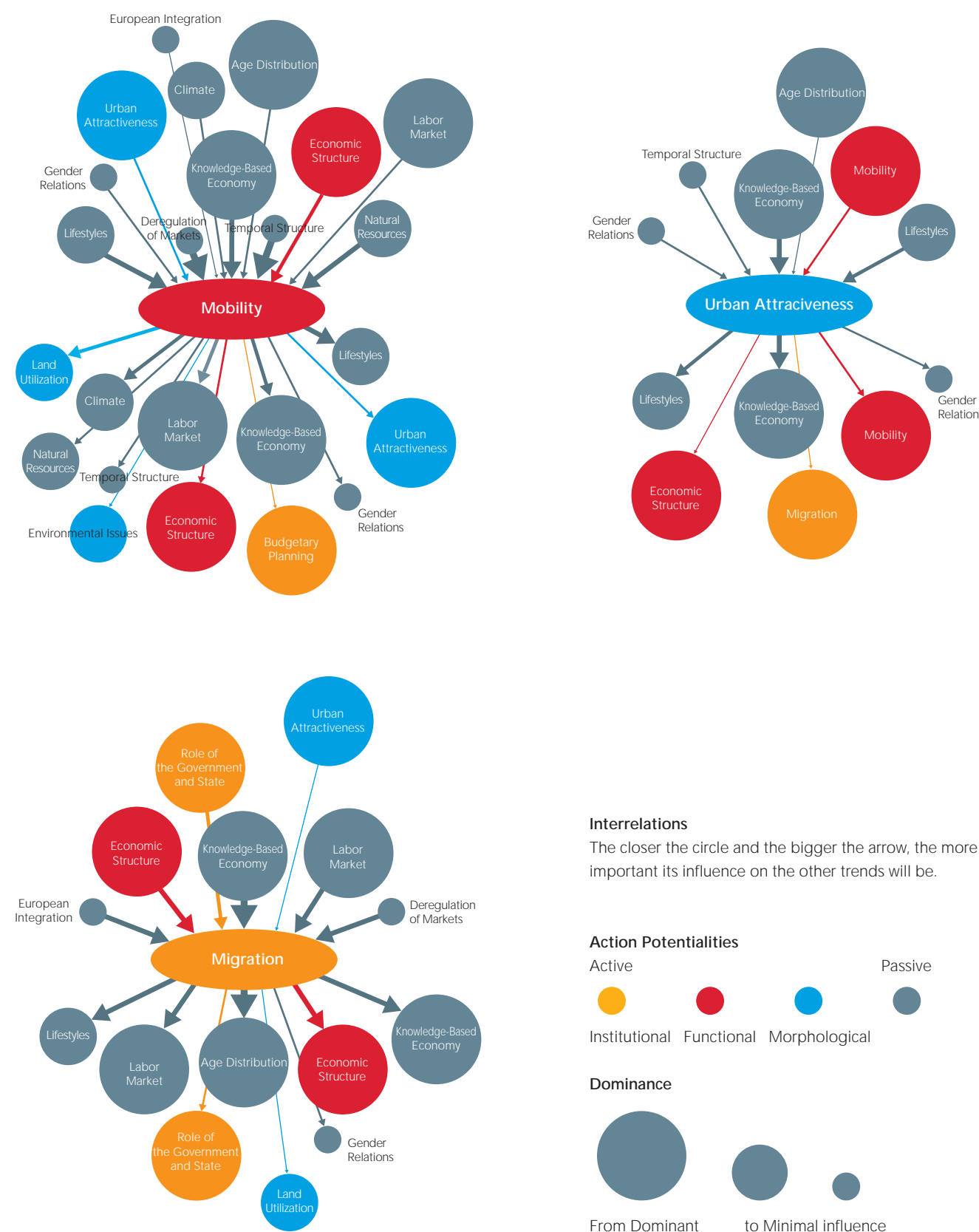


Figure 16
Interrelatedness of Trends in Mobility, Migration and Urban Attractiveness: An Identification of Liechtenstein's Options for Action.



8 The “Metamorphosis 50” Scenario

Exclusivity: The Principality of Liechtenstein has been able to maintain this reputation up until the year 2068. The residential location of Liechtenstein is distinguished by its clarity of structure and tranquility. It has proved possible to maintain the upscale areas of detached family homes for a relatively homogenous population despite increasing difficulties. Today as yesterday, the car remains the most important means of transport. Facilities offering daily goods and services are not within walking distance. Several years ago it was finally decided to axe the subsidies to local public transport due to slack demand. This means that individual residents now face challenges: The costs of basic goods and services in Liechtenstein's upscale residential areas are considerably higher than in urban residential locations situated in large metropolitan regions. At the same time, Liechtenstein still regards itself as a location with pronounced historic roots and values. The continued reputation of Liechtenstein as a financial location is based on such traditional values. Thanks to its autonomous legislative status, the Principality of Liechtenstein continues to offer attractive conditions for the management of assets. Close and well developed relations with customers, especially in German speaking areas and countries, and Europe, is a big plus point. Today, the world wide market of financial centers has been relinquished to other competitors. In the first years after the year 2000 it became evident that the highly populated regions of Asia would develop into heavyweight regions, in terms of world wide capital in search of investment equity. The competition between the financial centers for this capital was intense and fast moving, with many of Liechtenstein's competing firms being able to offer attractive legal and tax conditions. Only the really big and important banks in Europe have succeeded in entering the financial markets in Asia. The financial institutions in Zurich, for instance, made considerable efforts in good time to be able to cover the dynamic markets in the Middle and the Far East from “old” Europe. The number of companies and the good accessibility to Zurich international airport were decisive factors here. Knowledge-intensive jobs are also very important to Liechtenstein's economy today, and in the year 2068. Company head offices and highly specialized R&D departments of some globally operating high tech companies are located in Liechtenstein. They feel connected to the Principality for reasons of tradition. Yet owners of businesses also feel clear location disadvantages for these business divisions. The relocation of production to locations with low wages had already begun to take place in the first half of the century. At that time, Liechtenstein viewed itself as being affected

by a trend also experienced by many other industrial nations in the west. At regional level, this structural change has been superimposed by the increasing pull of the large urban areas of Zurich, Munich and Stuttgart, which due to their critical mass and considerable economic dynamism, have attracted workers from the Alpine Rhine Valley. Today, little is left of the enthusiasm which surrounded the initial position of “Precision Valley” in the year 2000. The previous concentration of knowledge, skills and innovation has since dissipated and is now scattered in all directions. For this reason, company decision makers are increasingly beginning to doubt as to whether it will be possible to maintain the business areas currently remaining in Liechtenstein in the future. A particularly important point here is that companies are finding it increasingly difficult to commit the required qualified human capital to the location of Liechtenstein. Locations in the metropolitan region of northern Switzerland, close to the airport for example, represent attractive alternatives to research and development departments. The gradual decline of the location of Liechtenstein as compared with competing locations over the last 60 years first manifested itself in the declining availability of qualified and highly qualified workers and was particularly painful. A large proportion of innovative and competitive companies as well as qualified human capital has relocated to the important global hubs of the knowledge-based economy, i.e. to large urban centers and metropolitan regions. The fact that Liechtenstein was gradually losing its place in the international competition between locations was only recognized after a considerable period of time had elapsed. The statement “standing still is the same as going backwards” offers an accurate description of the process. A problem of perception is closely linked to this realization, however. On the one hand, standing still is not viewed as being negative from the individual perspective if the condition reached is judged as being satisfactory. On the other hand, the dynamics of the competitive situation and the endeavors and efforts of the competitors are barely recognizable from the individual's worm's eye view. Today it is evident that Liechtenstein has not yet achieved the necessary critical mass of density, opportunities and features to be an attractive location in the global knowledge-based economy. A comparison of the Principality of Liechtenstein in the year 2068 with structurally weak regions located on the periphery of Europe reveals that the Principality is still an exceptionally strong location. But an overall comparison of Liechtenstein with the leading regions points to the Principality being merely an average location.

How did this development come about? The phrase “Metamorphosis 50” describes a process of change which is characterized by a superimposing of active internal trading and passive external influences. The Principality of Liechtenstein has consistently taken individual steps with a lesser or greater amount of success in order to help industry and the financial sector to maintain its position in the competition for locations. These temporal, sectional and spatially based individual measures have proved incapable of reversing or offsetting negative external trends. As a result, the change in Liechtenstein over the last 60 years has not been intentional and does not correspond with the individual objectives. The caterpillar has not turned into a butterfly; the process of change has not completely succeeded. To a great degree, the facets of this lack of success come to light in the four mega themes previously described.

In relative terms, the location of Liechtenstein has sustained a loss in terms of its appeal to qualified and highly qualified workers. To date, the country has strictly maintained its restrictive immigration policy. There continues to be an excess of workers who live outside Liechtenstein and commute in, but their numbers are declining as the once high wage differential between Liechtenstein and the other places in the Alpine Rhine Valley has now largely balanced out. Viewed externally, the reputation for exclusivity enjoyed by the residential location of Liechtenstein has clear disadvantages, attributable to its lack of constructional and functional density. Alongside the lack of local public transport, the poor provision of cultural and social facilities fails to fulfill the expectations of the current generation of mobile and highly qualified people. The insufficient urban qualities of Liechtenstein are also clear in its lack of public space and its lack of visible public life. This is a reflection of the mentality of the country.

Today, the landscape of Liechtenstein comes across as an incoherent coexistence of different forms of use lacking in special structures or attributes. The valley floor is rather unattractive in terms of recreation and is

largely inaccessible. Here it is evident that in the past, Liechtenstein found neither the will nor the means to develop a cross-national landscape concept along the river Rhine in joint cooperation with others. In this context it also proved impossible to use the flood protection measures necessary due to climate change in order to bring about an improvement to the cross-national landscape features of the Alpine Rhine Valley. The re-strengthened Rhine dam continues to cut across the valley area as a clearly recognizable infrastructure development today.

The financial resources of Liechtenstein have not permitted the provision of the necessary investments for the development of railway infrastructure. At the same time, the rail routes on the Swiss side of the Alpine Rhine Valley have all been upgraded to handle fast inter city trains. Liechtenstein does not have the levels of demand to achieve the status of a supraregional transport hub. For this reason it can only be accessed with the train via exhausting and time consuming changes. The gradual decline of Liechtenstein as a location was late in entering the consciousness of the political parties. This creeping process was difficult to perceive. The politicians believed they could rest on their laurels for too long. In 2008, Liechtenstein was in a relatively comfortable situation. It was able to attract many well qualified workers from abroad into what was a high wage economy, and its economic performance indicators were excellent. In the first half of the 21st century, globalization presented many countries with big challenges. The countries which were willing to look to the future and to seize opportunities by taking brave steps forward are now in a good position. Liechtenstein responded a little too late and thus lost too much of the advantage it enjoyed in 2008 to be able to catch up again over the medium term. Today, the Principality is languishing, like an island in the Alpine Rhine Valley, with middling attributes. The country stands out as a residential location for traditional and privileged social groups who continue to live on the basis of the capital which was built up in the second half of the 20th century.

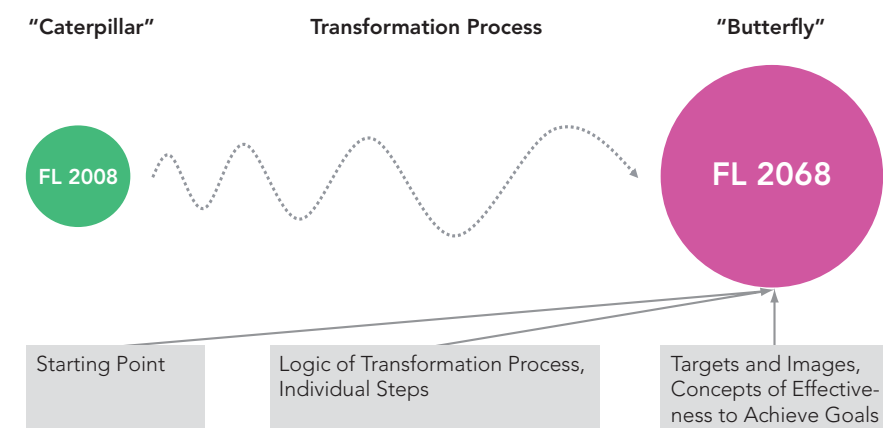
9 The “Metamorphosis 100” Scenario

In the Metamorphosis 50 scenario, Liechtenstein in 2068 has been halfway left behind. Over the years, it has made a few changes in response to the differing challenges of the current context, but it has failed to implement any daring, far-sighted measures. Strategic, forward looking action, in contrast, means in pictorial terms that it is also possible for the caterpillar (Liechtenstein in 2008) to turn into a butterfly (Liechtenstein in 2068). The metamorphosis is complete, having succeeded 100 percent. The caterpillar had all of the basic building blocks and the construction plans to become today's butterfly. They weren't visible, however, and made almost no impression in the past. To make the hidden potential useable, the possibilities for action stored in the caterpillar had to be completely transformed. It was not possible to create Liechtenstein in its current form through extending the past reality of the year 2008. Driving forces in the form of targets, images and concepts of effectiveness were necessary to achieve these goals. The path towards the future, which has become today's present, came to exist through the sum of provident and coordinated individual steps. The transformation of Liechtenstein from the caterpillar to the butterfly had to be implemented mentally, functionally and morphologically. The Principality of Liechtenstein had to render above average performances in almost all areas. Close cooperation with its neighbors in the Alpine Rhine Valley area became possible through forward looking actions and clearly managed exterritorial engagement. Liechtenstein realized

quickly that it could not afford to wait for the services of others, and that it had to proceed by taking steps forward in a wide range of areas on its own. This pioneering role of Liechtenstein was the starting point for the continual growth and deepening of cross-border trust and cooperation that has continued over the last 60 years. The same approach also took hold within Liechtenstein itself. People originating from places outside Liechtenstein were increasingly welcomed; not just on a temporary basis as qualified and highly qualified workers, but also as colleagues, neighbors and friends living in the same country.

In 2068, the Principality of Liechtenstein represents the economic and cultural power house of the Alpine Rhine Valley. Liechtenstein's knowledge-based economy is based on two firm pillars. First, Liechtenstein is a privileged location for advanced producer services. As a financial location, it offers world class niche products in a smart interplay with neighboring Zurich and is a heavyweight in the international financial services sector. Liechtenstein's exception added value in the field of high knowledge service providers isn't just down to asset management, however. Its autonomous status means that it can occupy additional and internationally acknowledged niches. Along with insurance services, Liechtenstein also offers specialist services for the protection of intellectual property. This is where the targeted interplay with the second pillar of the knowledge-based economy comes into effect. Liechtenstein is part of the research and development

Figure 17
Metamorphosis 100 – Determinants for Liechtenstein's Process of Transformation.



Northern Town Center.

Northern Town Center

Anyone comparing a map of today's Alpine Rhine Valley with the situation in 2008 will immediately notice the dramatic transformations that have taken place over the past 60 years in the Principality of Liechtenstein and its surrounding areas in Switzerland. Such changes are particularly striking in "Zentrum Nord", the progressive working and residential town in the northern part of the country. What has emerged in place of the sporadic office buildings that populated the scene just a few decades ago is a center of innovation with a worldwide reputation that attests to the qualities that make Liechtenstein a premier site for research and development. How can this success be best explained? More than a few observers regard its emergence as one of the most salient examples of the new generation of comprehensively developed technology clusters, originally launched as inner city projects, such as the Novartis campus in Basel. In this regard, developments such as Zentrum Nord can be seen as a critical response to the curious insularity of these first endeavors. They represent a broader understanding of location that manifests itself in the specific case of Liechtenstein. Politicians and business leaders joined forces to generate and coordinate the visionary concept, "The Alpine Rhine Valley – A Focal Point for Innovation". This concept views research and development policy as an integrated approach that accords the same significance to issues of corporate profitability and knowledge as it does to employees' requirements regarding housing, culture and leisure. A visitor to Zentrum Nord encounters vivid manifestations of this long-term strategy at every turn. Here, accessibility, competence, and quality of life are not just abstract terms but are combined into a coherent concept. Five rapid transit stops in the center ensure extremely short commuting times for the many employees from the northern Unterland as well as for those coming from Austria and Switzerland. The sports grounds and parks are popular at lunchtime when the sun is out and offer innumerable opportunities for recreation and relaxation. Additionally, an important aspect of this successful model is the fact that Zentrum Nord represents an integrated mixture of a center for research and a progressive residential community. The urban residences nestling in the hills around Ruggell have proven highly popular. Here, long-established families reside alongside high-tech specialists from all over the world. They both appreciate the peace and quiet of living there while taking advantage of the cultural and leisure activities offered in the nearby urban center of Vaduz.



stronghold which is the Alpine Rhine Valley. "Precision Valley" is now well known for its rapid implementation of research results into new products and holistic solutions. Its exceptional development expertise is based on the dense network of smaller and larger highly specialized high tech companies. Together with additional regional players such as public administrative organizations and training and education and research institutions, these form the cross national, regional system of innovation and production that is the Alpine Rhine Valley. Complementary information exchange relationships, as well as cooperation and competition all lead to the permanent further development of the specific resources of knowledge, skills and innovative ability. The Principality of Liechtenstein is making targeted use of the benefits of this regionally anchored know-how through its autonomous legislative status, through targeted, specialized, knowledge-intensive services in the field of intellectual property protection, to name but one example.

The regional and supraregional impulses provided by the Principality are facilitated by its critical mass of residents and jobs. Today, in 2068, the small state is succeeding in benefiting from the positive return flow effects in the mega themes of value creation, human capital and resources. The minimum numbers of approx. 100,000 residents and 90,000 jobs, of which 45,000 are occupied by workers who live outside Liechtenstein and commute in, represents the key quantitative condition for Liechtenstein's appeal. This critical mass is representative of the density and diversity which now characterizes Liechtenstein – a diversity of different but mutually enriching fields such as the employment market, life styles and urban attractiveness. It was its new size which also brought Liechtenstein its breakthrough in terms of accessibility a few years ago. The efficient connection of the country with the European high speed network triggered key network effects on the location. This has also enabled the country to achieve the critical mass of workers and local population required to assist Liechtenstein-based companies in making important value added steps which extend beyond their function as headquarters. The close interlocking of the high knowledge service providers with the high tech locations in the region also makes a big contribution to this.

Liechtenstein has become the powerhouse of the Alpine Rhine Valley as the result of a double strategy. On the one hand, Liechtenstein is able to create a decisive difference because of its autonomous status. This applies to the legal and tax conditions for people and companies as much as it does to the physical and tangible form of Liechtenstein as a place to live and work in. Achieving comparative advantages in the area of location competition is paramount both at supraregional and global levels. On the other hand, the suc-

cess of the Principality of Liechtenstein is also based on a careful interplay with the Alpine Rhine Valley that has given it key advantages in the competition for locations which cannot be provided through its smallness and relatively peripheral location: Accessibility, human capital as well as cross-border added value. Liechtenstein isn't only succeeding in setting regional impulses in these areas, however. Its role as a pioneer, which is firmly based on its own exceptional attributes, has long radiated out on a regional basis and has now caused intrinsic values to spiral upwards both in the Alpine Rhine Valley and the adjacent areas. The urban design, scenic, social and cultural formulation of the residential and working location of Liechtenstein increases both its own attractiveness as well as that of the adjacent communities in the competition for human capital. The Principality of Liechtenstein views the Alpine Rhine Valley as being a resonant place of strength in the international competition among locations. The extraterritorial commitment of Liechtenstein for shared tasks such as the improvement of transport accessibility or the cross-border development of scenic spaces goes without saying in the year 2068.

Yet quantities alone can't explain today's success of Liechtenstein as a location. Liechtenstein could easily have accommodated 100,000 residents and the corresponding jobs with a continuation of the settlement structures of the year 2008 as well. At that time it was clear that a modest increase in building would have provided considerable scope for distributing such quantities within the Principality of Liechtenstein. The quantities aspired to in Liechtenstein could only represent one necessary condition for the successful qualities of the location. In order to understand the necessary and possible qualities of the working and living location of Liechtenstein, it was necessary to apply the interactions of the trends of migration, mobility and urban attractiveness in a targeted way (Figures 20 to 22). In 2008 it was already clear that Liechtenstein was not able to satisfy its future requirements for qualified and highly qualified workers from its own resources. The reservoir of human capital in the region was about to run dry. It was necessary to embark on a comprehensive revamp of territorial and extraterritorial Liechtenstein's appeal to qualified workers from outside of the region.

Today, Liechtenstein has evidently achieved a high level of international and local accessibility. This is not only a decisive factor for knowledge-intensive companies which are frequently reliant on face to face contact with business partners and customers. Those working in Liechtenstein are also aware that the pulsating metropolitan cities of Zurich and Munich, as well as Zurich international airport, are within easy reach. Today it is almost impossible to feel anything of the previously peripheral location of Liechtenstein. The spatial prox-

imity and concentrated interaction at supraregional level is evident regionally and locally. The deciding factor in this was the consistent constructional and functional concentration of activity in Liechtenstein, radiating out from the Alpine Rhine Valley. The spatial concentration of residents and jobs facilitates constructional and functional densities whose atmosphere can be compared with the sophisticated urban qualities of cities like St. Gallen or Chur. Today's image of Liechtenstein is characterized by its density and intensity of encounters and exchange. Many people describe the variety of lifestyles and worlds of experience that they invariably come across in Liechtenstein today as being particularly special.

Constructional concentration within Liechtenstein went hand in hand with a reinterpretation of spatial mobility. The development of an efficient public transport system in Liechtenstein, based on a revamped rail network, was initially facilitated through the previously discussed connection to the rapid rail link from Zurich to Munich. On the other hand, network effects at regional and local level also proved decisive. These were generated by the new concentration of people and jobs. The farsighted mobility concept in Liechtenstein brings together all the different modes of transport: Pedestrians, cyclists, car and public transport together form a backbone of differing speeds. The strengthening of slower traffic services has made a considerable contribution to the attractive urban environments in Liechtenstein, which offer a wide range of amenities and functions at walking distance.

These new forms and qualities of accessibility which combine with each other at different levels could barely have been thought possible in 2008. The benefits of this have not only been felt in Liechtenstein itself, but radiate right across the Alpine Rhine Valley. It was once the insufficient freedom of choice on offer in Liechtenstein as a residential location which made commuting into Liechtenstein necessary for many thousands of workers each day. The presence of the cross-border commuters was felt to be a situation forced on the country by external factors. Today, however, the residential locations in the Alpine Rhine Valley enrich the residential location of Liechtenstein thanks to their specific attributes. The Principality of Liechtenstein regards them as important suburban areas and intends to create a complementary interplay. Together with the surrounding region, the location of Liechtenstein never fails to impress thanks to the varied and attractive range of lifestyle options it offers. Today, the commuting of workers to Liechtenstein is the result of a freedom of choice which is exercised by approx. 45,000 people each day. Bearing this factor in mind, attractive public transport services that provide excellent links to the commuters' places of residence to Liechtenstein are indispensable. Its mobility strat-

egy has secured the Principality of Liechtenstein its attractiveness to qualified workers from all over the region. The transport policy is supporting the working, living and leisure qualities on offer at the location of Liechtenstein and is making a considerable contribution to the appeal of the country to qualified and highly qualified workers.

The look of Metamorphosis 100

What will Liechtenstein look like after the metamorphosis? What will the country with 100,000 residents and 90,000 jobs look like in terms of its urban design? How will people live there and spend their leisure time? Such considerations, as with all insights into the future, are naturally characterized by unpredictable and imponderable factors. When we ask about the outline, attributes and quirks of Liechtenstein in 60 years time there is the risk of indulging in wishful thinking rather than in specific answers. It is not possible to simply design the city of the future on a drawing board. This is a painful experience that urban designers went through time and time again in the 20th century. A prime example of an ambitious attempt to design an aesthetically impressive city of the future, and with it the society of the future, is Brasilia. This new capital city, which was built from scratch in the steppe countryside in inland Brazil from nothing, and designed in 1955 under the direction of Oscar Niemeyer and Lucio Costa before then being built in record time, is now widely viewed to be a utopian vision of the city of tomorrow which didn't work out as planned. The architecture of the city, which remains futuristic, strongly reflects the future visions and social ideas of 1955. However, today's reality, in a city designed around an imaginary future that was planned out yesterday, has little in common with what was originally planned. The lesson to be learned from Brasilia can be extrapolated and should not be ignored in the case of Liechtenstein in 2068. No plan, no matter how sophisticated, is able to eliminate the difference between today's image of tomorrow and tomorrow's image of today.

This does not under any circumstances mean however, that we cannot make any statements about the future of the city or that we can only feel about in the dark. If the metamorphosis succeeds then Liechtenstein will become the distinctive city in the Alpine Rhine Valley, designed on the basis of its location, history and prevailing conditions. This Liechtenstein will not simply be the result of a plan, however. It will gain its characteristic features from the functional, mental and morphological changes to the current situation in a gradual development. A glance at the development of cities since industrialization demonstrates that periods of high growth, such as the suggested increase in population up to 70,000 residents and/or a tripling of the population over 60 years do not represent an unusual pace of

Figure 18

The Map on the left shows the current Settlement Structure in Liechtenstein. The Map on the right shows how a Continuation of the current Trends would cause the characteristic Features of the Valley to have disappeared by 2068.

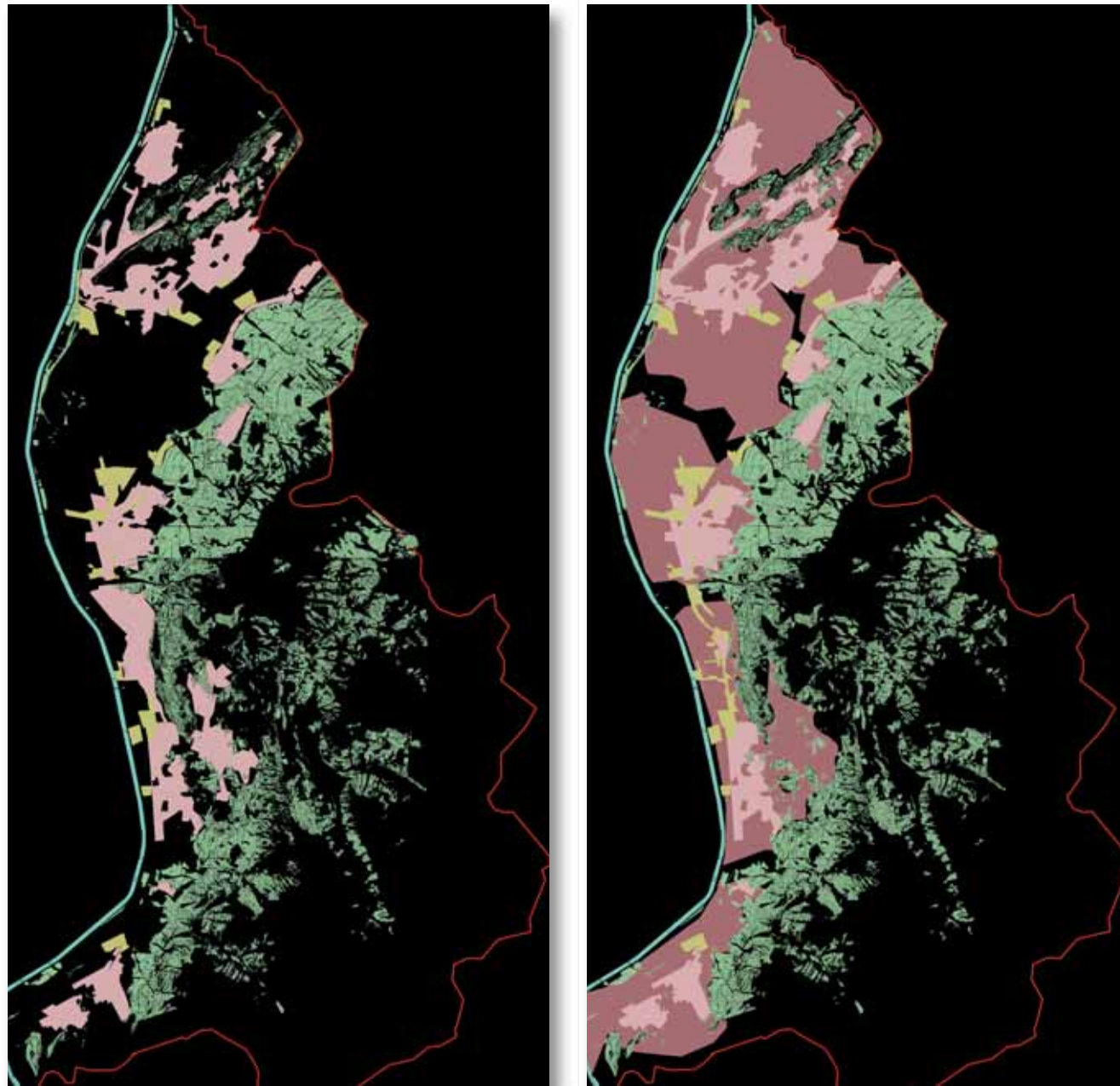
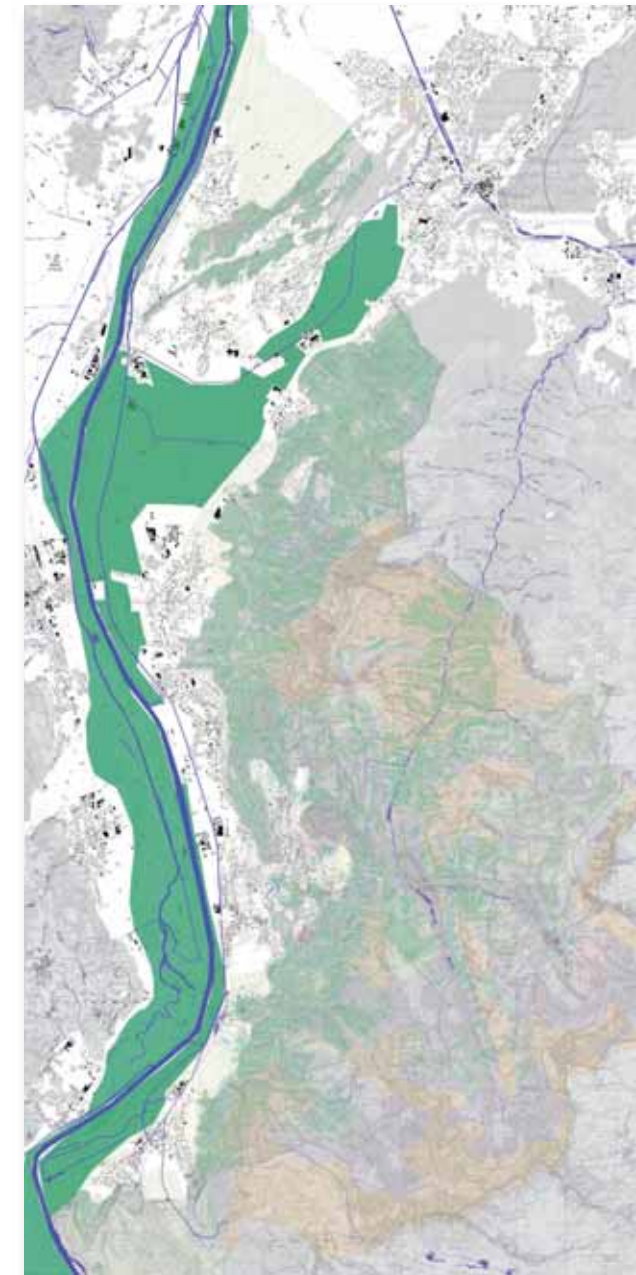


Figure 19

Landscape area of the Alpine Rhine Valley: A striking green Belt provides a Contour to the Valley and embeds Residential and working Life in a diverse Area.



development. Vienna, for instance, had a total population of only 400,000 in the 1840s, but its population had already reached the one million mark in 1880 before totaling more than 1.6 million at the turn of the century. The population of Berlin, to mention another example, increased by nearly six times between 1850 and 1900, and the population of London grew by more than four million over the same period. Such dynamics do not merely apply to the classic European metropolitan centers, however. In Switzerland, for instance, the cities of St. Gallen, Geneva, Lausanne and Winterthur more than tripled in size between 1900 and 1960, and Zurich, the largest city, added a further 250,000 residents during this period.

The developmental Trend of 2008 and its Deficits

An analysis of the current settlement and spatial structure in Liechtenstein demonstrates that the existing spatial development trend might continue. In the valley area, it would be possible to accommodate 100,000 residents and 90,000 jobs quite easily. The price of achieving this would be high, however. A glance at the map of the development of the trends shows that developments at such a scale can only be achieved at the cost of building over the entire valley area. Repeated building developments in the traditional rural style would not lead to the preservation of today's rural and village-like character, but contrary to intentions, would probably result in the development of a new Los Angeles in the Alpine Rhine Valley, as it were. Rural attributes would fall victim to such a form of development, with areas of land on the valley floor currently used for agricultural, recreational and leisure purposes completely disappearing. At the same time, a permanent collapse in the transport system could occur, as this configuration is only accessible to public transport along the most important axes, and it would only be possible to link up the less accessible areas at considerable cost and impairment. In the event of a continuation of the trend, Liechtenstein threatens to be engulfed by a permanent traffic chaos which would create severe obstacles to economic development.

The continuation of the current trends in settlement development cannot, therefore be a satisfactory option for the future. The creation of a more attractive, sustainable and stronger Liechtenstein as a place of business and living requires a change of course in terms of spatial development. It may sound like a paradox, but successfully dealing with the increasing requirements of Liechtenstein as a place of business and maintaining the current identities and features is only possible through a comprehensive revision of the current structures.

The approach to urban planning

After all the preceding discussion it should be clear that Liechtenstein in 2068 will not be a creation of "grand gestures". Visionary high wire acts are hardly likely to gain the political support they need to be implemented, nor would a tabula rasa be able to create the conditions envisioned. So in the place of such visionary overall designs we prefer to define structures which can emerge in the course of many smaller and larger construction and planning projects. Under suitable conditions they will enable the country to become what it has to be in order to maintain its privileged position of today. However, the fact that we reject the "grand construction" approach certainly does not imply that Liechtenstein's future should not be based on an all-encompassing idea. It is much more the case that extensively farsighted ideas in policy and planning are indispensable if the goals for 2068 are to be achieved. Each attempt at transformation must take into consideration that the current inventory of buildings and structures will more or less have disappeared over the period of 60 years which we are contemplating. Above all, historically valuable buildings are likely to survive while most of today's residential, industrial and office structures will probably be replaced over the same period. This requirement for replacement, itself a compelling function of the natural life cycle of buildings, greatly opens up latitude for a new spatial profile of the country and allows us to think of a structuring program from a super ordinate perspective.

The leading and super ordinate spatial idea of the transformation required might lead to the creation of a large landscape belt along the Alpenrhein river as depicted on the previous map. In the north this belt extends to Feldkirch and also incorporates Swiss territory around the area of the river. Hence in a spatial sense it symbolizes how the future of Liechtenstein will largely depend on the extent to which the country succeeds in integrating the surrounding neighboring areas into everyday working life and indeed everyday life at home.

The generously sized green belt has various tasks to fulfill: It structures the countryside of Liechtenstein in the valley area into a center in the north and acts as a focal point for the Schaan-Vaduz-Triesen area. At the same time it represents a highly distinctive area for local recreation and leisure which should be easy to get to from the residential and employment areas of the future. Finally, the green belt should also host an efficient transport infrastructure which efficiently links Liechtenstein to all the other important centers in the Alpine Rhine Valley and to the urban conurbations of Munich and Zurich.

The focal point around Vaduz with 50,000 to 60,000 inhabitants is reflected in an integrated work and residential location in the north with 25,000 to 35,000 residents. The remaining population will be chiefly concentrated in the valley area since the country's topography is set to remain a factor limiting further extension. This factor could become even more exacerbated in the future since the farming of the cultivated Alpine landscape will no doubt radically be called into question by the ongoing process of structural change in agriculture.

The building blocks of the new Liechtenstein can now be placed into this super ordinate structure. From a business perspective, the critical mass required for a highly diverse and attractive way of life will be created by the two centers mentioned above. As by far the largest town in the Alpine Rhine Valley, Vaduz-Schaan will act as its primary driving force. Hence large scale construction projects which are indispensable to competitiveness such as the building of a main railway station in Vaduz appear sensible. The railway station would link the area to the super ordinate large urban regions and once again emphasize the fact that the new town is itself a regional centre. The creation of concentrated, dense and heterogeneous employment areas will enable an efficient link-up to companies which remain dependent on a large influx of commuters coming in from the outlying regions. It is precisely the creation of such concentrated employment spots which raised the plausibility and necessity of a rail link that could open up the Alpine Rhine Valley for the development of a rapid transit public transport system.

The following pages present the key elements from which the Principality will have to be built up into Liechtenstein 2068. We should like to call them "building blocks". They should be regarded as prototypical constellations which are intended not so much to represent a specific place in Liechtenstein in 60 years time as to illustrate various functions and the required treatment of such functions in order to achieve a successful Metamorphosis 100.

All in all we regard four different building blocks as being of elementary importance:

- Vaduz-Schaan with a spacious urban centre and main railways station
- Neighborhoods: The new residential areas
- The valley area as a multifunctional area used for leisure and transport purposes
- "Zentrum Nord" with hi-tech jobs and partly integrated residential uses

Each of these four components are presented in the fold-out pages through a series of graphics and explained in a brief text.

10 Final remarks

Virtually everything changes over a period of 60 years. Yet the future cannot be mapped out as an extension of current developments. The scenario "Metamorphosis 100" should be understood as a minimum requirement in order for the Government of Liechtenstein to achieve the goals it has set for 2068. To do so the Principality has to come up with above-average accomplishments in almost every field of action if it wants to maintain its position in comparison to its competitors in the international competition between locations. It may not succeed in this endeavor. A standstill – albeit one at high level – still means a step backwards if other locations continue to develop. Liechtenstein's slow backslide is evident in a number of different aspects revealed in the four mega themes. Liechtenstein's "Metamorphosis 50" is the result of a reactive, "wait and see" attitude; change occurs elsewhere. This paper analyses the levers of control and fields of action available to Liechtenstein in an institutional, functional and morphological regard. It sets out a framework of possibilities for the success and relative failure of the goals that have been set for 2068. However, the actual path to the future, i.e. the individual steps which have to be taken at temporal, thematic and spatial level in the sense of a strategic policy program, lies outside the remit of this paper.

Neighborhoods.

Neighborhoods

Recently built apartments in Liechtenstein serve as a perfect example of intelligently designed housing policies that have been comprehensively envisaged. It is hardly surprising that many of the buildings and housing estates that have emerged in recent decades are featured in every standard work on the subject. The overriding political principle of this concept, which has been copied frequently ever since, is as simple as it has been ambitious: Housing development means urban development. The general policy is consequently that all aspects of the development process must be considered within an overall perspective, from the integration of the buildings in the urban context to the provision of infrastructure for each residential estate: Energy efficiency, flexible living units, a “walking distance” policy, exemplary provision of facilities for pre-school and school-age children, convenient access to public transport and generous green spaces all feature on the agenda of the Principality of Liechtenstein as a residential and employment location. The residential estates presented here in Schaan-West have all been developed through competitions. These developments form a convincing counterpoint to gated communities as well as to the excessively condensed urban centers. Density and proximity to nature are not a contradiction here. Furthermore, the Liechtenstein example underlines just how decisive the promotion of community qualities can be for a contemporary residential and employment location. In these thoroughly integrated residential areas with their well-developed infrastructure, experts have recognized the qualities responsible for the excellent reputation that Liechtenstein merits today. Once again they reveal how housing policy can have sweeping consequences. The conceptual and architectural attributes of the apartments and houses are combined with the benefits of their careful integration in the neighborhoods. In this way, the quality of housing represents a pivotal contribution to the integration and identity of the rapidly expanding population and exerts a calming influence on the pulsating everyday reality of this high-tech and financial center in the Alpine Rhine Valley.



List of credits for figures and photos

- 1–7 Authors' depiction
 8 © Citytrain AG, apart from photos on first line © globetrotter GmbH
 9 Authors' depiction
 10 Authors' depiction based on ARE 2005: 71; BBR 2003: 80
 11 Authors' depiction. Sources: Bundesamt für Statistik 2007; Statistik Austria 2007; Statistisches Bundesamt Deutschland 2006; Eurostat 2004; BBR 2006; UN 2004
 12–17 Authors' depiction
 18 Melanie Grill and Stefan Duelli, Mastertrack urbane, Hochschule Liechtenstein
 19 Karin Lorenz and Lucie Vanecková, Mastertrack urbane, Hochschule Liechtenstein
 20 Fold out pages: Authors' depiction

Literature

- Amt für Volkswirtschaft (2007): Liechtenstein in Zahlen 2007/2008. Vaduz: Amt für Volkswirtschaft, Abteilung Statistik. http://www.llv.li/pdf/llv-aww-statistik-fliz-2008-gesamte_broschuere, accessed 7 January 2008.
- ARE, Bundesamt für Raumentwicklung (2005): Raumentwicklungsbericht 2005. Berne: Bundesamt für Raumentwicklung.
- ARE, Bundesamt für Raumentwicklung und Eidgenössisches Departement für Umwelt, Verkehr, Energie und Kommunikation UVEK (2006): Perspektiven des schweizerischen Personenverkehrs bis 2030. Bern: Bundesamt für Raumentwicklung.
- BBR, Bundesamt für Bauordnung und Raumplanung (2007): Frauen – Männer – Räume. Bd. 26. Berichte. Bonn: Bundesamt für Bauordnung und Raumplanung.
- BBR, Bundesamt für Bauwesen und Raumordnung (2003): Szenarien zur Raumentwicklung – Raum und Siedlungsstrukturen Deutschlands 2015/2040. Bd. Heft 12. Forschungen, Bundesamt für Bauwesen und Raumordnung (Hrsg.). Bonn: Selbstverlag des BBR.
- BBR, Bundesamt für Bauwesen und Raumordnung (2006): Raumordnungsprognose 2020/2050. Bevölkerung – Private Haushalte – Erwerbspersonen – Wohnungsmarkt. Bonn: Bundesamt für Bauwesen und Raumordnung.
- Biedermann (2007): Ausländer- und Passamt Landesverwaltung Liechtenstein. Telephone inquiry, 21 January 2008, Vaduz.
- Bundesamt für Statistik (2007): Zukünftige Bevölkerungsentwicklung – Daten, Indikatoren – Kantonale Szenarien. http://www.bfs.admin.ch/bfs/portal/de/index/themen/01/03/blank/key_kant/03.html, accessed 28 January 2008.
- BUWAL, Bundesamt für Umwelt Wald und Landschaft (2005): Wachstum und Umweltbelastung: Findet eine Entkopplung statt? Umweltmaterialien Nr. 198 – Ökonomie. Bern.
- Castells, Manuel (1996): The information age: economy, society and culture, Volume I – The Rise of the Network Society. Malden: Blackwell Publishers.
- Contor, Gesellschaft für Grundbesitz – Baubetreuung – Investitionen mbH (2005): St. Galler Rheintal. Das Hochtechnologie-Tal. Standortstudie "Hochtechnologie: St. Galler Rheintal im Vergleich". Hünxe: Contor. http://www.chancental.ch/downloads/Contor_Analyse_neu.pdf, accessed 7 January 2008.
- Credit Suisse (2004): Fürstentum Liechtenstein. Struktur und Perspektiven. Zurich: Economic & Policy Consulting. https://entry4.credit-suisse.ch/csfs/research/p/d/de/schweiz/regionen/media/pdf/reg_rst_liechtenstein_2004_de.pdf, accessed 10 January 2007.
- Deutsche Bank Research (2002): Die demografische Herausforderung. Demografie Spezial. Frankfurt am Main: Deutsche Bank Research.
- Eickhof, Norbert (2003): Globalisierung, institutioneller Wettbewerb und nationale Wirtschaftspolitik. In: Volkswirtschaftliche Diskussionsbeiträge Universität Potsdam, 52, <http://www.uni-potsdam.de/u/wipo/db52.pdf>, accessed 15 January 2008.
- Eisenhut, Peter (2004): Entwicklung und Perspektiven der Volkswirtschaft des Fürstentums Liechtenstein. Studie im Auftrag der Regierung des Fürstentums Liechtenstein.
- ESPON, European Spatial Planning Observation Network (2006): ESPON ATLAS. Mapping the structure of the European territory. CD-Rom. Luxembourg: Ministry of Interior and Spatial Development in Luxembourg.
- ESPON, European Spatial Planning Observation Network (2007): Scenarios on the territorial future of Europe – ESPON Project 3.2. Luxembourg: Ministry of Interior and Spatial Development in Luxembourg.
- EU Com, European Commission (2001): White Book – European transport policy for 2010: time to decide. http://ec.europa.eu/transport/white_paper/documents/doc/lb_texte_complet_de.pdf, accessed 28 January 2008.
- Eurostat (2004): EUROPOP2004 – Population Projection. Luxembourg: Amt für amtliche Veröffentlichungen der Europäischen Gemeinschaften.
- Gutachtergruppe "Zukunft Bayern 2020" (2007): Zukunft Bayern 2020. Nachhaltige Politik für Kinder, Bildung und Arbeit. Megatrends und ihre bessere Nutzung durch Wirtschaft und Wissenschaft. Gutachten der Expertenkommission "Zukunft Bayern 2020". Munich: Wissenschaftlich-Technischer Beirat der Bayerischen Staatsregierung.

- http://epp.eurostat.ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-028/DE/KS-SF-07-028-DE.PDF, accessed 28 January 2008.
- IEA, International Energy Agency (2006): World Energy Outlook 2006. Paris.
- Intraplan Consult (2007): Prognose der deutschlandweiten Verkehrsverflechtungen 2025. München – Freiburg. http://www.bmvbs.de/Anlage/original_1021619/Verkehrsprognose-2025-Kurzfassung.pdf, accessed 28 January 2008.
- IPCC (2007): Forth Assessment Report – Working Group II Impacts, Adaptation and Vulnerability. Cambridge: Intergovernmental Panel for Climate Change. <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter12.pdf>, accessed 20 September 2007.
- Kirt, Romain and Arno Waschkuhn (2001): Was ist und zu welchem Zwecke betreibt man Kleinstaaten-Forschung? Ein Plädoyer für die wissenschaftliche Beschäftigung mit kleinen Nationen. In: Romain Kirt and Arno Waschkuhn (Hrsg.), Kleinstaaten-Kontinent Europa. Probleme und Perspektiven. Baden-Baden: Nomos: 23–48.
- Kujath, Hans Joachim (2005): Die neue Rolle der Metropolregionen in der Wissensökonomie. In: Hans Joachim Kujath (Hrsg.), Knoten im Netz. Serie Stadt- und Regionalwissenschaften, Institut für Regionalentwicklung und Strukturplanung (Hrsg.). Münster: Lit Verlag: 23–63.
- Leuthold, Heiri (2008): Revealing Social Topography. Districts of Mega-City Regions. In: Alain Thierstein and Agnes Förster (Hrsg.), The Image and the Region. Making Mega-City Regions Visible! Baden: Lars Müller Publishers.
- Michaels, Ed, Helen Handfield-Jones and Beth Axelrod (2001): The War for Talent. Boston, Massachusetts: Harvard Business School Press.
- OECD, Organisation for Economic Co-Operation and Development (2007): OECD – Economic Outlook 2007 Nr. 87. Paris.
- Paasi, Anssi (2003): Region and place: regional identity in question. In: Progress in Human Geography 27(4): 475–485.
- Regierung des Fürstentums Liechtenstein (2006): Regierungsprogramm 2005–2009. <http://www.liechtenstein.li>, accessed 18 December 2007.
- Rothschild, Kurt W. (1993): Kleinstaat und Interdependenz. Anmerkungen zur Kleinstaatentheorie aus ökonomischer Sicht. In: Arno Waschkuhn (Hrsg.), Kleinstaat. Grundsätzliche und aktuelle Probleme. Liechtenstein Politische Schriften 16, Bd. 16. Vaduz: Verlag der Liechtensteinischen Akademischen Gesellschaft: 71–88.
- Simon, Silvia (2006a): Der Kleinstaat Liechtenstein im Zeitalter der Globalisierung. Beiträge Liechtenstein-Insitut. Vaduz: Liechtenstein-Insitut. <http://www.liechtenstein-institut.li/Default.aspx?tabid=545>, accessed 7 January 2008.
- Simon, Silvia (2006b): Zukunftsfähige Wirtschaftsentwicklung von Kleinstaaten. Kleinheitsbedingte Optionen und Restriktionen am Beispiel Liechtenstein. Beiträge Liechtenstein-Insitut. Vaduz: Liechtenstein-Insitut. <http://www.liechtenstein-institut.li/Default.aspx?tabid=545>, accessed 7 January 2008.
- Simon, Silvia (2007): Personelle Ressourcenknappheit – Problemaufriss, Ursachen und Ansatzpunkte im Fürstentum Liechtenstein. Arbeitspapiere des Liechtenstein-Instituts. Vaduz: Liechtenstein-Institut. <http://www.liechtenstein-institut.li/Default.aspx?tabid=545>, accessed 07 January 2008.
- Staatskanzlei St. Gallen (2004): Amtsblatt des Kantons St. Gallen. Bd. 202(41). Amtliches Publikationsorgan. http://www.sg.ch/etc/medialib/dokument_library/services/amtsblatt/2004/nr_41.Par.0001.File.tmp/Am, accessed 7 January 2008.
- Stabsstelle für Kommunikation und Öffentlichkeitsarbeit (2008): Liechtenstein in Kürze. <http://www.liechtenstein.li>, accessed 15 January 2008.
- Stabsstelle für Kommunikation und Öffentlichkeitsarbeit (2008b): Wirtschaft: Besonderheiten. http://www.liechtenstein.li/liechtenstein_main_sites/portal_fuerstentum_liechtenstein/fl-wuf-wirtschaft_finanzen/fl-wuf-industrie/fl-wuf-industrie-besonderheiten.htm, accessed 20 January 08.
- Statistik Austria (2007): Vorausberechnete Bevölkerungsstruktur für Vorarlberg 2006–2075 laut Hauptszenario. http://www.statistik.at/web_de/statistiken/bevoelkerung/demographische_prognosen/bevoelkerungsprognosen/027316.html, accessed 28 January 2008.
- Statistisches Bundesamt, Deutschland (2006): Bevölkerung Deutschlands nach Bundesländern. Ergebnisse der 11. koordinierten Bevölkerungsvorausberechnung nach Ländern. Wiesbaden.
- Steinmüller, Karlheinz and Angelika Steinmüller (2006): Die Zukunft der Technologien. Hamburg: Murmann.
- Stiens, Gerhard (1998): Prognosen und Szenarien in der räumlichen Planung. In: Akademie für Raumforschung und Landesplanung (Hrsg.), Methoden und Instrumente der räumlichen Planung. Hanover: Akademie für Raumforschung und Landesplanung: 113–145.
- Stiens, Gerhard (2005): Prognosemethoden. In: Handwörterbuch der Raumordnung, Hanover: Akademie für Raumforschung und Landesplanung.
- Strittmatter Partner AG (2003): Fürstentum Liechtenstein. Einwohner und Arbeitsplätze. Grundlagenanalyse und Prognose. St. Gallen: Strittmatter Partner AG.
- Stutzer, Alois and Bruno S. Frey (2007): Commuting and Life Satisfaction in Germany. In: Informationen zur Raumentwicklung (2/3): 179–189.
- Thierstein, Alain, Christian Kruse, Lars Glanzmann, Simone Gabi and Nathalie Grillon (2006): Raumentwicklung im Verborgenen. Untersuchungen und Handlungsfelder für die Entwicklung der Metropolregion Nordschweiz. Zurich: NZZ Buchverlag.
- Thierstein, Alain, Christof Abegg, Michael Droß, Sabine Friedrich, Viktor Goebel, Wilhelm Natrup, Mark Sieber and Matthias Thoma (2007): Perspektive München. Bilanz: Evaluierungsbericht 2007. Zwischenbericht: Entwurf vom 5.2.2007. Munich: Landeshauptstadt München.
- Thierstein, Alain, Viktor Goebel and Stefan Lüthi (2007): Standortverflechtungen der Metropolregion München. Über Konnektivität in der Wissensökonomie. Endbericht Forschungsprojekt. München: Lehrstuhl für Raumentwicklung, TU München. <http://www.raumentwicklung-tum.de/publikationen.php>, accessed 20 January 2008.

- UBS, Wealth Management Research (2006): Wirtschaftsprognose Schweiz.
www.ubs.com/1/ShowMedia/ubs_ch/wealth_mgmt_ch/research/swiss?contentId=99952&name=prog_d.pdf, accessed 28 January 2008.
- UN, United Nations Population Division (2004): World Population Prospects – The 2004 Revision. Department of Economic and Social Affairs Population Division. New York.
- Uni Köln and Prognos AG (2005): Energiereport IV – Die Entwicklung der Energiemärkte bis zum Jahr 2030. Energiewirtschaftliche Referenzprognose. Cologne, Basle. http://www.ewi.uni-koeln.de/fileadmin/user/Veroeff/Energiereport_IV_Kurzfassung_de.pdf, accessed 28 January 2008.
- Vanberg, Viktor (2005): Auch Staaten tut Wettbewerb gut: Eine Replik auf Paul Kirchhof. In: Freiburger Diskussionspapiere zur Ordnungsökonomik (2005). Freiburg.
- Vester, Frederic (2002): Die Kunst vernetzt zu denken. Ideen und Werkzeuge für einen neuen Umgang mit Komplexität; ein Bericht an den Club of Rome, updated and extended paperback edition. München: Deutscher Taschenbuch Verlag.
- Wackernagel, Mathis and William Rees (1997): Unser ökologischer Fußabdruck – Wie der Mensch Einfluß auf die Umwelt nimmt. Basle: Birkhäuser.
- Weinbrenner, Peter (2002): Szenariotechnik. <http://www.sowi-online.de/>, accessed 15 January 2008.
- Wüest + Partner (2008): Immo-Monitoring 2008. Zurich: Wüest + Partner.
- Zukunftsinstitut (2006): Trend-Report 2007. Soziokulturelle Schlüsselrends für die Märkte von morgen. Kelkheim: Zukunftsinstitut.
- Zürcher Kantonalbank (2004): Preise, Mieten und Renditen. Der Immobilienmarkt transparent gemacht. Zurich: Zürcher Kantonalbank.

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- ¹ Some methodological remarks with regard to connectivity: From the individual viewpoint of a company it is to be expected that the provision and delivery of a service, which generally consists of a chain of individual value-added steps, is reflected in the various locations of the company. After all, a company's choice of location is not a matter left to random chance: it covers central strategic requirements of the firm. The sum of individual corporate location behavior allows us to deduce specific attributes and tasks of locations within the locational network. Moreover, spatial location patterns provide clues to tangible and intangible exchange relationships between locations. The point is that knowledge is created through a process of exchange within the intra-corporational location network. This exchange is expressed intangibly in information and communication flows. Physically and tangibly it is linked to the flows of people and goods.
- ² Trend reversals – i.e. a sudden reversal of emerging developments due to individual, unforeseen events – have not been taken into consideration for methodological reasons. Although the trends have not been formulated on the basis of a particular time horizon, we have selected the ones we consider to be robust in the long term and which in our opinion will shape the possible futures of the Principality of Liechtenstein in 2068. In this sense the individual trends do not necessarily still have to be operating in 2068, but are assumed to have a decisive influence on the path into the future.
- ³ In this connection the Zukunftsinstitut think-tank recently established the maxim: "The individual's path to self-realisation is inviolable" (Zukunftsinstitut 2006).