Regional Competitiveness in a Global Economy: Issues for Luxembourg

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Luxembourg
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Luxembourg Competitiveness 2005

• Based a strong upswing of growth in the mid-90s, Luxembourg has become one of Europe’s most prosperous regions

• The successful development of the financial services cluster, now the core engine of the Luxembourg economy, has been the main driver of success

• Since 2001, Luxembourg has registered from significantly lower growth rates, reflecting the slow-down in the European economy and in the financial services cluster

• The changing competitive landscape in financial services, especially regulatory changes on the European level, are creating new challenges for the Luxembourg cluster

• To sustain and grow its high level of prosperity in the new competitive environment, Luxembourg needs to define a clear competitiveness strategy
Comparative Economic Performance
Real GDP Growth Rates

Countries sorted by 1998-2003 annual real GDP growth rate (CAGR)

Regional Competitiveness in a Global Economy: Issues for Luxembourg

• Fundamentals of Regional Competitiveness

• Luxembourg’s Current Competitive Position

• Towards a Competitiveness Agenda for Luxembourg
What is Competitiveness?

• Competitiveness is determined by the **productivity** (value per unit of input) with which a nation, region, or cluster uses its human, capital, and natural resources. Productivity sets a nation’s or region’s standard of living (wages, returns on capital, returns on natural resources)
  – Productivity depends both on the **value** of products and services (e.g. uniqueness, quality) as well as the **efficiency** with which they are produced.
  – It is not **what** industries a nation or region competes in that matters for prosperity, but **how** firms compete in those industries
  – Productivity in a nation or region is a reflection of what both domestic and foreign firms **choose to do in that location**. The location of ownership is secondary for national prosperity.
  – The productivity of “**local**” industries is of fundamental importance to competitiveness, not just that of traded industries
  – Devaluation and revaluation do **not** make a country more or less “competitive”

• Nations and regions compete in offering the **most productive environment** for business
• The public and private sectors should play **different but interrelated roles** in creating a productive economy
Innovation and Competitiveness

- Innovation is more than just scientific discovery
- There are no low-tech industries, only low-tech firms
Determinants of Competitiveness

Macroeconomic, Political, Legal, and Social Context

Microeconomic Foundations

The Sophistication of Company Operations and Strategy

The Quality of the Microeconomic Business Environment

- A sound macroeconomic, political, legal, and social context creates the potential for competitiveness, **but is not sufficient**
Successful economic development is a process of successive economic upgrading, in which the business environment in a nation evolves to support and encourage increasingly sophisticated ways of competing.
Clusters and Competitiveness
Cairns (Australia) Tourism

- Public Relations & Market Research Services
- Food Suppliers
- Property Services
- Maintenance Services

- Travel agents
- Tour operators

- Restaurants
- Attractions and Activities e.g., theme parks, casinos, sports
- Hotels
- Airlines, Cruise Ships

- Local Transportation
- Souvenirs, Duty Free
- Banks, Foreign Exchange
- Local retail, health care, and other services

- Government agencies e.g. Australian Tourism Commission, Great Barrier Reef Authority
- Educational Institutions e.g. James Cook University, Cairns College of TAFE
- Industry Groups e.g. Queensland Tourism Industry Council

Sources: HBS student team research (2003) - Peter Tynan, Chai McConnell, Alexandra West, Jean Hayden
The California Wine Cluster

Sources: California Wine Institute, Internet search, California State Legislature. Based on research by MBA 1997 students R. Alexander, R. Arney, N. Black, E. Frost, and A. Shivananda.
Finding an International Niche
Leading Footwear Clusters

Portugal
• Production
• Focus on short-production runs in the medium price range

Romania
• Production subsidiaries of Italian companies
• Focus on lower to medium price range

China
• OEM Production
• Focus on low cost segment mainly for the US market

Italy
• Design, marketing, and production of premium shoes
• Export widely to the world market

United States
• Design and marketing
• Focus on specific market segments like sport and recreational shoes and boots
• Manufacturing only in selected lines such as hand-sewn casual shoes and boots

Brazil
• Low to medium quality finished shoes, inputs, leather tanning
• Shift toward higher quality products in response to Chinese price competition

Vietnam/Indonesia
• OEM Production
• Focus on the low cost segment mainly for the European market

Source: Research by HBS student teams in 2002 – Van Thi Huynh, Evan Lee, Kevin Newman, Nils Ole Oermann
Institutions for Collaboration
Selected Massachusetts Organizations, Life Sciences

Life Sciences Industry Associations
- Massachusetts Biotechnology Council
- Massachusetts Medical Device Industry Council
- Massachusetts Hospital Association

University Initiatives
- Harvard Biomedical Community
- MIT Enterprise Forum
- Biotech Club at Harvard Medical School
- Technology Transfer offices

General Industry Associations
- Associated Industries of Massachusetts
- Greater Boston Chamber of Commerce
- High Tech Council of Massachusetts

Informal networks
- Company alumni groups
- Venture capital community
- University alumni groups

Economic Development Initiatives
- Massachusetts Technology Collaborative
- Mass Biomedical Initiatives
- Mass Development
- Massachusetts Alliance for Economic Development

Joint Research Initiatives
- New England Healthcare Institute
- Whitehead Institute For Biomedical Research
- Center for Integration of Medicine and Innovative Technology (CIMIT)
## Composition of Regional Economies
### United States, 2002

<table>
<thead>
<tr>
<th></th>
<th>Traded Clusters</th>
<th>Local Clusters</th>
<th>Natural Resource-Driven Industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Share of Employment</td>
<td>30.5%</td>
<td>68.8%</td>
<td>0.7%</td>
</tr>
<tr>
<td>Employment Growth Rate,</td>
<td>0.9%</td>
<td>2.4%</td>
<td>-1.2%</td>
</tr>
<tr>
<td>1990 to 2002</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Average Wage</td>
<td>$45,511</td>
<td>$29,010</td>
<td>$33,066</td>
</tr>
<tr>
<td>Relative Wage</td>
<td>129.7%</td>
<td>82.7</td>
<td>94.3</td>
</tr>
<tr>
<td>Wage Growth</td>
<td>4.3%</td>
<td>3.6%</td>
<td>1.8%</td>
</tr>
<tr>
<td>Relative Productivity</td>
<td>144.1</td>
<td>79.3</td>
<td>140.1</td>
</tr>
<tr>
<td>Patents per 10,000</td>
<td>21.3</td>
<td>1.3</td>
<td>7.0</td>
</tr>
<tr>
<td>Employees</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of SIC Industries</td>
<td>590</td>
<td>241</td>
<td>48</td>
</tr>
</tbody>
</table>

Note: 2002 data, except relative productivity which uses 1997 data.
Specialization of Regional Economies
Select U.S. Geographic Areas

- **Seattle-Bellevue-Everett, WA**
  - Aerospace Vehicles and Defense
  - Fishing and Fishing Products
  - Analytical Instruments

- **San Francisco-Oakland-San Jose Bay Area**
  - Communications Equipment
  - Agricultural Products
  - Information Technology

- **Chicago**
  - Communications Equipment
  - Processed Food
  - Heavy Machinery

- **Los Angeles Area**
  - Apparel
  - Building Fixtures, Equipment and Services
  - Entertainment

- **San Diego**
  - Leather and Sporting Goods
  - Power Generation
  - Education and Knowledge Creation

- **Denver, CO**
  - Leather and Sporting Goods
  - Oil and Gas
  - Aerospace Vehicles and Defense

- **Wichita, KS**
  - Aerospace Vehicles and Defense
  - Heavy Machinery
  - Oil and Gas

- **Pittsburgh, PA**
  - Construction Materials
  - Metal Manufacturing
  - Education and Knowledge Creation

- **Baltimore, MD**
  - Construction Materials
  - Metal Manufacturing
  - Education and Knowledge Creation

- **Atlanta, GA**
  - Construction Materials
  - Transportation and Logistics
  - Business Services

- **Raleigh-Durham, NC**
  - Communications Equipment
  - Information Technology
  - Education and Knowledge Creation

- **Houston**
  - Heavy Construction Services
  - Oil and Gas
  - Aerospace Vehicles and Defense

Note: Clusters listed are the three highest ranking clusters in terms of share of national employment.
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School
Specialization of Regional Economies
Atlanta Metro Area

Note: Uses narrow cluster definitions to avoid overlap
Source: Cluster Mapping Project, Institute for Strategy and Competitiveness, Harvard Business School
Competition Between Locations

Context
• Falling trade barriers
• Falling costs of transportation and communication
• Increasing number of locations meeting basic requirements of businesses

Trends
• More competition between locations
• More specialization of locations
• More linkages across locations

• Changes in the geography of economic activities are not a zero-sum game
• Companies and locations are learning how to manage the changes in locational patterns under way
# Shifting Responsibilities for Economic Development

<table>
<thead>
<tr>
<th>Old Model</th>
<th>New Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Government drives economic development through policy decisions and incentives</td>
<td>• Economic development is a <strong>collaborative process</strong> involving government at multiple levels, companies, teaching and research institutions, and institutions for collaboration</td>
</tr>
</tbody>
</table>
Luxembourg’s Economic Performance

• High level of labor productivity but **low growth rates** in recent years

• **Magnet for labor** from neighboring countries and further abroad
  – Roughly one third of the labor force expatriates, one third commuting in from neighboring countries
  – Low local unemployment

• **High local price levels**

• Patenting is **substantial** for the size of the economy, with a significant presence of foreign companies
  – Most of the patenting in traditional sectors not classified as “high-tech”

• Large **inward foreign direct investment**, driven by strong international presence in the financial services cluster

• Strong **world market position** in financial service exports; stable but modest in goods exports
Labor Productivity and Utilization
European Regions

GDP per Employee, Euro, 2002

Employment as % of Population, 2002

Source: Eurostat, 2005
Labor Productivity – Level and Growth
Selected Countries

GDP per Hour Worked,
US-\$, 2004 (PPP adjusted)

Average Annual Growth Rate of GDP per Hour Worked (PPP adjusted), CAGR, 1999 - 2004

Source: Groningen Growth and Development Centre and The Conference Board, 2005
Labor Utilization – Level and Growth
Selected Countries

Hours worked per Employee, 2004

Change of Hours worked per Employee, 2004 versus 2000

Source: Groningen Growth and Development Centre and The Conference Board, 2005
Luxembourg’s Current Competitiveness

• Level of general business environment quality is insufficient to sustain current level of prosperity
  – Strengths in the cluster-specific business environment for the financial services sector can partly compensate
  – But there are clear barriers for the evolution of other clusters that would decrease the dependency on one cluster

• Company sophistication ranks somewhat higher than business environment quality
Global Competitiveness Report 2004
The Relationship Between Business Competitiveness and GDP Per Capita

Note: OECD countries marked in blue
Source: Global Competitiveness Report 2004
<table>
<thead>
<tr>
<th>Country</th>
<th>BCI Rank</th>
<th>Business Environment</th>
<th>Company Sophistication</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>1</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Finland</td>
<td>2</td>
<td>1</td>
<td>7</td>
</tr>
<tr>
<td>Germany</td>
<td>3</td>
<td>5</td>
<td>1</td>
</tr>
<tr>
<td>Sweden</td>
<td>4</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>Switzerland</td>
<td>5</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>6</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Denmark</td>
<td>7</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Japan</td>
<td>8</td>
<td>11</td>
<td>3</td>
</tr>
<tr>
<td>Netherlands</td>
<td>9</td>
<td>9</td>
<td>6</td>
</tr>
<tr>
<td>Singapore</td>
<td>10</td>
<td>8</td>
<td>13</td>
</tr>
<tr>
<td>Hong Kong SAR</td>
<td>11</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>France</td>
<td>12</td>
<td>16</td>
<td>10</td>
</tr>
<tr>
<td>Australia</td>
<td>13</td>
<td>12</td>
<td>20</td>
</tr>
<tr>
<td>Belgium</td>
<td>14</td>
<td>19</td>
<td>11</td>
</tr>
<tr>
<td>Canada</td>
<td>15</td>
<td>13</td>
<td>16</td>
</tr>
<tr>
<td>Austria</td>
<td>16</td>
<td>17</td>
<td>14</td>
</tr>
<tr>
<td>Taiwan</td>
<td>17</td>
<td>20</td>
<td>12</td>
</tr>
<tr>
<td>New Zealand</td>
<td>18</td>
<td>15</td>
<td>21</td>
</tr>
<tr>
<td>Iceland</td>
<td>19</td>
<td>18</td>
<td>18</td>
</tr>
<tr>
<td>Norway</td>
<td>20</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>Israel</td>
<td>21</td>
<td>21</td>
<td>19</td>
</tr>
<tr>
<td><strong>Luxembourg</strong></td>
<td><strong>22</strong></td>
<td><strong>23</strong></td>
<td><strong>17</strong></td>
</tr>
<tr>
<td>Ireland</td>
<td>23</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>Malaysia</td>
<td>24</td>
<td>24</td>
<td>29</td>
</tr>
<tr>
<td>Korea</td>
<td>25</td>
<td>28</td>
<td>22</td>
</tr>
</tbody>
</table>

Source: GCR 2004
# Company Operations and Strategy

## Luxembourg's Relative Position 2004

### Competitive Advantages

<table>
<thead>
<tr>
<th>Advantage</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of regional sales</td>
<td>4</td>
</tr>
<tr>
<td>Control of international distribution</td>
<td>8</td>
</tr>
</tbody>
</table>

### Competitive Disadvantages

<table>
<thead>
<tr>
<th>Disadvantage</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of marketing</td>
<td>25</td>
</tr>
<tr>
<td>Breadth of international markets</td>
<td>25</td>
</tr>
<tr>
<td>Extent of incentive compensation</td>
<td>23</td>
</tr>
<tr>
<td>Degree of customer orientation</td>
<td>22</td>
</tr>
<tr>
<td>Reliance on professional management</td>
<td>22</td>
</tr>
<tr>
<td>Willingness to delegate authority</td>
<td>19</td>
</tr>
<tr>
<td>Production process sophistication</td>
<td>18</td>
</tr>
<tr>
<td>Nature of competitive advantage</td>
<td>18</td>
</tr>
<tr>
<td>Value chain presence</td>
<td>18</td>
</tr>
<tr>
<td>Capacity for innovation</td>
<td>17</td>
</tr>
<tr>
<td>Extent of branding</td>
<td>17</td>
</tr>
<tr>
<td>Company spending on research and development</td>
<td>17</td>
</tr>
</tbody>
</table>

Source: Unpublished data collected for the Global Competitiveness Report 2004-2005
Assessment of the Luxembourg Business Environment

**Context for Firm Strategy and Rivalry**

+ Attractive tax level
+ Open to international competition
~ Weak policies affecting competition
~ Corporatist traditions affect rules & regulations
~ Companies compete on efficiency, not innovation

**Factor (Input) Conditions**

+ Strong financial markets
~ Communication and physical infrastructure quality only moderate
~ Efficiency of administrative infrastructure average
– Local skill base only average

**Demand Conditions**

+ Sophisticated demand from public and private buyers
– Relatively weak legal standards

**Related and Supporting Industries**

+ Strong and internationally competitive financial service cluster
– Few positions in other clusters
Luxembourg’s Relative Position

**Competitive Advantages**

- Quality of management schools
- Availability of scientists and engineers
- Quality of math and science education
- Quality of public schools

**Competitive Disadvantages**

- Quality of management schools: 83
- Availability of scientists and engineers: 62
- Quality of math and science education: 42
- Quality of public schools: 21

- Luxembourg has in the past relied on its ability to attract high-skilled talent from abroad, while the local workforce provided mid-level skills.
- Continued growth of prosperity – especially outside the financial services cluster – will require a significant upgrading of the educational system.

Source: Unpublished data collected for the Global Competitiveness Report 2004-2005
Skill Base
Selected Countries

Population with tertiary education, % of 25 – 64 years age class

1998 1999 2000 2001 2002 2003

Source: Eurostat, 2005
### Physical and Administrative Infrastructure

#### Luxembourg’s Relative Position

<table>
<thead>
<tr>
<th>Competitive Advantages</th>
<th>Competitive Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cell phones per 100 people (2003) 2</td>
<td>Air transport infrastructure quality 42</td>
</tr>
<tr>
<td></td>
<td>Telephone/fax infrastructure quality 26</td>
</tr>
<tr>
<td></td>
<td>Internet users per 10,000 people (2003) 21</td>
</tr>
<tr>
<td></td>
<td>Reliability of police services 17</td>
</tr>
<tr>
<td></td>
<td>Railroad infrastructure development 15</td>
</tr>
<tr>
<td></td>
<td>Quality of electricity supply 13</td>
</tr>
<tr>
<td></td>
<td>Administrative burden for startups 13</td>
</tr>
</tbody>
</table>

Source: Unpublished data collected for the Global Competitiveness Report 2004-2005
Science and Innovation
Luxembourg’s Relative Position

Competitive Advantages

Competitive Disadvantages

- Availability of scientists and engineers: 62
- University/industry research collaboration: 52
- Quality of scientific research institutions: 46

While Luxembourg rates high on patenting and private sector R&D spending, the region **lags** in other key dimensions effecting innovative capacity.

Source: Unpublished data collected for the Global Competitiveness Report 2004-2005
### Context for Firm Strategy and Rivalry

**Luxembourg’s Relative Position**

<table>
<thead>
<tr>
<th>Competitive Advantages</th>
<th>Competitive Disadvantages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tariff liberalization</td>
<td>Intensity of local competition</td>
</tr>
<tr>
<td>Foreign ownership restrictions</td>
<td>Ease of mergers and acquisitions</td>
</tr>
<tr>
<td>Hidden trade barrier liberalization</td>
<td>Extent of locally based competitors</td>
</tr>
<tr>
<td></td>
<td>Effectiveness of bankruptcy law</td>
</tr>
<tr>
<td></td>
<td>Effectiveness of anti-trust policy</td>
</tr>
<tr>
<td></td>
<td>Efficacy of corporate boards</td>
</tr>
<tr>
<td></td>
<td>Business costs of corruption</td>
</tr>
<tr>
<td></td>
<td>Favoritism in decisions of government officials</td>
</tr>
<tr>
<td></td>
<td>Cooperation in labor-employer relations</td>
</tr>
</tbody>
</table>

- While some of Luxembourg’s **weaknesses** in terms of the context for firm strategy and rivalry are directly related to the region’s **small absolute size**, there are also surprising in areas directly related to **policy choices**

Source: Unpublished data collected for the Global Competitiveness Report 2004-2005
Towards a Competitiveness Agenda for Luxembourg

• Address weaknesses in the business environment
  – Upgrade the **skill base**
  – Develop the capabilities of the university, with a **cluster focus**
  – Raise **infrastructure** to world-class standards, especially in telecommunications

• Concerted effort to upgrade the **financial cluster**

• Broaden the **cluster base**, focusing on niches
  – Business services
  – Tourism
  – Others

• Deepen integration with **neighboring regions** of Belgium, France, and Germany
  – Linkages with neighboring clusters
Public / Private Cooperation in Cluster Upgrading
Minnesota’s Medical Device Cluster

Context for Firm Strategy and Rivalry

- Aggressive trade associations (Medical Alley Association, High Tech Council)
- Effective global marketing of the cluster and of Minnesota as the “The Great State of Health”
- Full-time “Health Care Industry Specialist” in the department of Trade and Economic Development

Factor (Input) Conditions

- Joint development of vocational-technical college curricula with the medical device industry
- Minnesota Project Outreach exposes businesses to resources available at university and state government agencies
- Active medical technology licensing through University of Minnesota
- State-formed Greater Minnesota Corp. to finance applied research, invest in new products, and assist in technology transfer

Demand Conditions

- State sanctioned reimbursement policies to enable easier adoption and reimbursement for innovative products

Related and Supporting Industries