Norwegian Competitiveness: Where Does the Nation Stand?

Professor Michael E. Porter
Institute for Strategy and Competitiveness
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Oslo Business Summit
Oslo, Norway
October 22nd, 2004


Further information on Professor Porter’s work and the Institute for Strategy and Competitiveness is available at www.isc.hbs.edu
Norwegian Competitiveness

• One of the most *prosperous* countries in the world

• Recent economic performance has fallen *below* that of many peer countries

• There is no consensus on the right strategy to secure Norwegian prosperity *after the oil resources* have been exploited

• An *objective assessment* of Norwegian competitiveness is essential to inform a discussion about the country’s future strategy
Real GDP Development Over Time
Selected OECD Countries, 1998 - 2003

Sorted by CAGR, 1998 – 2003:
- Ireland
- Korea, Rep. Of
- Hungary
- New Zealand
- Canada
- Australia
- Spain
- United States
- Finland
- Sweden
- United Kingdom
- Czech Republic
- France
- Netherlands
- Denmark
- Norway
- Italy
- Germany
- Japan
- Switzerland

Comparative Economic Performance

Compound annual growth rate of real GDP per capita, 1998-2003

Note: Ireland’s GDP is above 20% above its GNI because of large profits accruing to foreign-owned companies.

Source: Groningen Growth and Development Centre and The Conference Board (2004), authors’ calculations.
Comparative Economic Performance
Prosperity Without the Direct Contribution of Oil & Gas

Note: Estimated performance without the direct GDP contribution of oil & gas ("mining and extraction sector"), Ireland’s GNI is 20% lower than its GDP
Source: Groningen Growth and Development Centre and The Conference Board (2004), Statistics Norway (2004), authors’ calculations
What is Competitiveness

- Innovation is **more than just scientific discovery**
- There are **no low-tech industries**, only low-tech firms
Labor Productivity
Selected Countries

Real GDP per Hour Worked
2003, $-US

Growth of Real GDP per Hour, CAGR, 1998-2003

Note: Estimated performance without the direct GDP contribution and hours worked of oil & gas ("mining and extraction sector")
Source: Groningen Growth and Development Centre and The Conference Board (2004), Statistics Norway (2004), authors’ calculations

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Labor Force Utilization
Selected Countries

Annual Hours Worked per Employee, 2003

Growth of Annual Hours Worked per Employee, CAGR, 2000-2003

Note: About 1% of all hours worked in Norway take place in the Oil sector; subtracting the oil sector Hours worked per employee increases by 7 hours a year

Source: Groningen Growth and Development Centre and The Conference Board (2004), Statistics Norway (2004), authors’ calculations
Domestic Cost Levels
Selected European Countries

Purchasing Power Parity Factor, 2003

Lower local prices relative to the United States

Higher local prices relative to the United States

- Norway is a **high cost** place to live and conduct business, as are other Nordic countries

Source: Groningen Growth and Development Centre and The Conference Board (2004), authors’ calculations
Norway’s output of internationally significant patents is low and well below innovation leaders.
Effectiveness of R&D Spending

US Patents in 2003 per 1 Mio. R&D Spending in 2001 (or latest available)

Source: OECD, USPTO, author’s calculation
Norway’s Export Performance
World Export Market Shares

World export share in %

1.4%
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
0.0%


All Goods
Non-oil Goods
Services
Total

Oil& Gas share of Goods exports

50.9% 49.4% 46.8% 54.4% 53.6% 43.2% 49.8% 63.6% 61.4% 60.1% na

Comparative Inward Foreign Investment
OECD Countries

FDI Stocks as % of GDP, Average 2000-2002

FDI Inflows as % of Gross Fixed Capital Formation, Average 2000-2002

Comparative Inward Foreign Investment
FDI Performance versus Potential

Rank Difference:
FDI Performance – FDI Potential, 2001

Czech Republic, Slovakia, Estonia, UK, Spain, Denmark, Latvia, Sweden, Lithuania, Poland, Hungary, Germany, Finland, Austria, Norway, Russia

Source: UNCTAD (2004), author’s analysis.
Multinational Companies’ Home Base

### Business Week 1000

<table>
<thead>
<tr>
<th>Rank</th>
<th>Company</th>
<th>Industry</th>
</tr>
</thead>
<tbody>
<tr>
<td>172</td>
<td>Statoil</td>
<td>Oil &amp; Gas</td>
</tr>
<tr>
<td>317</td>
<td>Norsk Hydro</td>
<td>Oil &amp; Gas</td>
</tr>
<tr>
<td>410</td>
<td>Telenor</td>
<td>Telecom</td>
</tr>
<tr>
<td>670</td>
<td>DnB NOR</td>
<td>Finance</td>
</tr>
<tr>
<td>986</td>
<td>Orkla</td>
<td>Conglomerate</td>
</tr>
</tbody>
</table>

Note: Business Week ranks by Market Value, the three leading Norwegian companies are in majority government ownership. Source: Business Week (2004), author’s analysis.
### Inherited Prosperity

- Prosperity is derived from selling **inherited** natural resources or real estate
- Prosperity is **limited** by the amount of resources available, and is ultimately **temporary**
- Focus gravitates towards the **distribution** of wealth as interest groups seek a bigger share of the pie
  - E.g. regions, public employees, powerful sectors
- **Government** is the central actor in the economy as the owner and distributor of wealth
- Resource revenues allow unproductive policies and practices to **persist**

### Created Prosperity

- Prosperity is derived from **creating valuable products and services**
- Prosperity is **unlimited**, based only by the innovativeness and productivity of companies in the economy
- Creating the **conditions** for productivity and innovation are the central policy question
- **Companies** are the central actors in the economy
- The **government**’s role is to create the enabling conditions
Determinants of Productivity and Productivity Growth

Macroeconomic, Political, Legal, and Social Context for Competitiveness

Microeconomic Foundations of Competitiveness

- 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.
- Competitiveness ultimately depends on improving the microeconomic capability of the economy and the sophistication of local companies and local competition.
Productivity and the Business Environment

Context for Firm Strategy and Rivalry

- A local context and rules that encourage investment and sustained upgrading—e.g., Intellectual property protection
- Meritocratic incentive system across institutions
- Open and vigorous competition among locally based rivals

Factor (Input) Conditions

- Presence of high quality, specialized inputs available to firms
  - Human resources
  - Capital resources
  - Physical infrastructure
  - Administrative infrastructure
  - Information infrastructure
  - Scientific and technological infrastructure
  - Natural resources

Demand Conditions

- Sophisticated and demanding local customer(s)
- Local customer needs that anticipate those elsewhere
- Unusual local demand in specialized segments that can be served regionally and globally

Related and Supporting Industries

- Access to capable, locally based suppliers and firms in related fields
- Presence of clusters instead of isolated industries

- 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
The Houston Oil and Gas Products and Services Cluster

Oil & Gas Exploration & Development

Oilfield Services/Engineering & Contracting Firms

Equipment Suppliers
(e.g. Oil Field Chemicals, Drilling Rigs, Drill Tools)

Specialized Technology Services
(e.g. Drilling Consultants, Reservoir Services, Laboratory Analysis)

Subcontractors
(e.g. Surveying, Mud Logging, Maintenance Services)

Business Services
(e.g. MIS Services, Technology Licenses, Risk Management)

Specialized Institutions
(e.g. Academic Institutions, Training Centers, Industry Associations)

Oil & Gas Completion & Production

Oil & Gas Transportation

Oil Trading

Oil Refining

Oil Distribution

Oil Wholesale Marketing

Oil Retail Marketing

Gas Gathering

Gas Processing

Gas Trading

Gas Transmission

Gas Distribution

Gas Marketing

Gas Processing

Gas Trading

Gas Transmission

Gas Distribution

Gas Marketing
## Institutions for Collaboration

### Selected Massachusetts Organizations, Life Sciences

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

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

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

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

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

#### Joint Research Initiatives
- New England Healthcare Institute
- Whitehead Institute For Biomedical Research
- Center for Integration of Medicine and Innovative Technology (CIMIT)
Global Competitiveness Report 2004
The Relationship Between Business Competitiveness and GDP Per Capita

Note: OECD countries marked in blue
Source: Global Competitiveness Report 2004
Business Competitiveness Index
Over- and Underperformance

Gap between actual and predicted GDP per capita, % of actual GDP per capita, 2003

Business and Growth Competitiveness Index
Norway’s Position over Time

Country Rank

Note: Constant sample of countries
Source: Global Competitiveness Report 2004
## Norway’s Relative Position 2003
### Company Operations and Strategy

<table>
<thead>
<tr>
<th>Competitive Advantages Relative to GDP per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Willingness to delegate authority</td>
</tr>
<tr>
<td>Extent of staff training</td>
</tr>
<tr>
<td>Reliance on professional management</td>
</tr>
<tr>
<td>Production process sophistication</td>
</tr>
<tr>
<td>Extent of marketing</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Competitive Disadvantages Relative to GDP per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value chain presence</td>
</tr>
<tr>
<td>Extent of regional sales</td>
</tr>
<tr>
<td>Breadth of international markets</td>
</tr>
<tr>
<td>Extent of incentive compensation</td>
</tr>
<tr>
<td>Extent of branding</td>
</tr>
</tbody>
</table>

Country Ranking, Arrows indicate a change of 5 or more ranks since 1998

Note: Rank by countries; overall Norway ranks 20 (23 on Company Operations and Strategy, 2 on GDP pc 2003)
Source: Global Competitiveness Report 2004
Private Sector R&D Investments

Private Sector R&D Expenditure as % of GDP, 2001 or latest

## Innovation Performance

### Top Norwegian Organizations in Terms of U.S. Patents

<table>
<thead>
<tr>
<th>Company</th>
<th>U.S. Patents, 1997-2001</th>
<th>Rank Among Patentors from the Baltic Sea Region*</th>
</tr>
</thead>
<tbody>
<tr>
<td>NYCOMED IMAGING AS</td>
<td>69</td>
<td>19</td>
</tr>
<tr>
<td>NORSK HYDRO</td>
<td>64</td>
<td>20</td>
</tr>
<tr>
<td>STATOIL</td>
<td>52</td>
<td>22</td>
</tr>
<tr>
<td>TANDBERG DATA A/S</td>
<td>19</td>
<td>77</td>
</tr>
<tr>
<td>ALVERN NORWAY A/S</td>
<td>17</td>
<td>87</td>
</tr>
<tr>
<td>ALCATEL</td>
<td>16</td>
<td>91</td>
</tr>
<tr>
<td>KVERNELAND KLEPP AS</td>
<td>14</td>
<td>102</td>
</tr>
<tr>
<td>SINVENT AS</td>
<td>12</td>
<td>112</td>
</tr>
<tr>
<td>ERICSSON NORWAY</td>
<td>11</td>
<td>118</td>
</tr>
<tr>
<td>BAKER HUGHES INC.</td>
<td>10</td>
<td>125</td>
</tr>
<tr>
<td>ELKEM ASA</td>
<td>10</td>
<td>125</td>
</tr>
<tr>
<td>PETROLEUM GEO-SERVICES A/S</td>
<td>10</td>
<td>125</td>
</tr>
<tr>
<td>KVAERNER MARITIME AS</td>
<td>9</td>
<td>143</td>
</tr>
<tr>
<td>WEATHERFORD/LAMB, INC.</td>
<td>9</td>
<td>143</td>
</tr>
<tr>
<td>ABB OFFSHORE TECHNOLOGY AS</td>
<td>8</td>
<td>159</td>
</tr>
<tr>
<td>AXIS BIOCHEMICALS AS</td>
<td>7</td>
<td>186</td>
</tr>
<tr>
<td>BOREALIS HOLDING A/S</td>
<td>7</td>
<td>186</td>
</tr>
<tr>
<td>GECO A.S.</td>
<td>7</td>
<td>186</td>
</tr>
<tr>
<td>KVAERNER ASA</td>
<td>7</td>
<td>186</td>
</tr>
</tbody>
</table>

Note: Baltic Sea Region includes Nordic countries, Baltic countries, Northwestern Russia, Northern Poland, and Northern Germany
Source: USPTO (2004), author’s analysis
Company Operations and Strategy

Key Observations

• Norwegian companies have **strengths** in employing modern management techniques and staff training

• However, they have **limited presence in the value chain** relative to peers

• While Norwegian companies employ a relatively high share of researchers, they fall **behind** other Nordic countries on R&D spending and international patenting

• Norway is home to **few internationally active** companies

• Norwegian companies lag in terms of **breadth of international positions**
The Norwegian Business Environment

Context for Firm Strategy and Rivalry

Factor (Input) Conditions

- Efficient public sector services and good legal system
- Strong communication and IT infrastructure
- Physical infrastructure and financial markets are comparable to peers
- Education and skills are generally strong but with emerging weaknesses

Demand Conditions

- Advanced regulations on IT and environmental quality
- Local demand sophistication from the private and public sector falls behind peer countries

Related and Supporting Industries

- Key clusters are oil & gas, maritime, fishing products, and telecom/IT; narrow position in light metals (aluminum)
- Low scores on the overall cluster strength

Conditions

- Low levels of corruption and strong domestic competition laws
- Relatively flexible labor markets and good labor relations
- Taxation high but below top levels of neighboring countries
  - Low level of rivalry in many markets, especially from foreign companies
  - Limited openness to international competition
  - Significant government presence in business

Related and Supporting Industries

- Local demand sophistication from the private and public sector falls behind peer countries
### Norwegian Business Environment

#### Core Strengths

<table>
<thead>
<tr>
<th>Factor Conditions</th>
<th>Context for Firm Strategy and Rivalry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Extent of bureaucratic red tape</td>
<td>Independence of decisions by government officials</td>
</tr>
<tr>
<td>Efficiency of legal framework</td>
<td>Protection of minority shareholders’ interests</td>
</tr>
<tr>
<td>Judicial independence</td>
<td>Business costs of corruption</td>
</tr>
<tr>
<td>Cell phones per 100 people (2003)</td>
<td>Intellectual property protection</td>
</tr>
<tr>
<td>Telephone/fax infrastructure quality</td>
<td>Effectiveness of anti-trust policy</td>
</tr>
<tr>
<td>Internet users per 10,000 people (2003)</td>
<td>Effectiveness of bankruptcy law</td>
</tr>
</tbody>
</table>

Note: Rank by countries; overall Norway ranks 20 (14 on National Business Environment, 2 on GDP pc 2003)

Source: Global Competitiveness Report 2004

CAON Norway 2004 Assessment 10-22-04 CK
Norwegian Business Environment

Misleading Perceptions of Strengths

• In some areas presumed to be Norwegian strengths, the country is either not significantly different from competing locations or shows signs of emerging weakness

Education and skills
• There is a high ratio of scientists and engineers in the workforce and a high share of labor market entrants with secondary education
• However, the share of graduates in science and technology is low and declining, test scores in assessments of educational attainment are only average despite high expenditures, and companies voice concerns about the quality of math & science education

Infrastructure
• Overall infrastructure quality is only on par or even below peers, especially in terms of rail and air transport infrastructure

Financial markets
• There is ample availability of debt capital but low level of financial market sophistication and limited equity market access
Norwegian Human Resources
Average of Reading, Scientific, and Mathematical Literacy

Average Educational Attainment, 2000

Source: OECD PISA-Study (2003), author’s calculation
Norwegian Business Environment
Misleading Perceptions of Weakness

• Other areas of the business environment which are presumed, at least abroad, to be Norwegian weaknesses are actually not major disadvantages versus competing locations

Labor market regulations

• While Norway has some regulatory barriers to hiring, it is rated as more flexible in terms of firing employees than many of other locations

Taxation

• While the overall tax burden on Norwegian is high, its incentive effects are rated as less negative than in many other European countries
Context for Strategy and Rivalry

Labor Market Flexibility*

Note: Score for the flexibility of regulations on labor contract termination
Context for Strategy and Rivalry
Taxation System

Source: Global Competitiveness Report 2004
## Norway’s Relative Position

### Context for Firm Strategy and Rivalry

<table>
<thead>
<tr>
<th>Competitive Disadvantages</th>
<th>Relative to GDP per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>Foreign ownership restrictions</td>
<td>46</td>
</tr>
<tr>
<td>Centralization of economic policy-making</td>
<td>31</td>
</tr>
<tr>
<td>Intensity of local competition</td>
<td>28</td>
</tr>
<tr>
<td>Tariff liberalization</td>
<td>26 ↓</td>
</tr>
<tr>
<td>Decentralization of corporate activity</td>
<td>25</td>
</tr>
<tr>
<td>Efficacy of corporate boards</td>
<td>22 ↓</td>
</tr>
<tr>
<td>Regulation of securities exchanges</td>
<td>19</td>
</tr>
<tr>
<td>Prevalence of mergers and acquisitions</td>
<td>16</td>
</tr>
<tr>
<td>Extent of locally based competitors</td>
<td>16 ↑</td>
</tr>
</tbody>
</table>

Country Ranking, Arrows indicate a change of 5 or more ranks since 1998

Note: Rank by countries; overall Norway ranks 20 (14 on National Business Environment, 2 on GDP pc 2003)

Source: Global Competitiveness Report 2004
Government Role in the Economy
Relative Size of the Public Enterprise Sector

Regulation of Product Markets
Selected OECD Countries

Source: Nicoletti/Scarpetta (2001)
## Norway’s Relative Position

### Demand Conditions

#### Competitive Advantages

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laws relating to ICT</td>
<td>2</td>
</tr>
<tr>
<td>Stringency of environmental regulations</td>
<td>8</td>
</tr>
</tbody>
</table>

#### Competitive Disadvantages

<table>
<thead>
<tr>
<th>Factor</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>Government procurement of advanced technology products</td>
<td>25</td>
</tr>
<tr>
<td>Presence of demanding regulatory standards</td>
<td>18</td>
</tr>
<tr>
<td>Sophistication of local buyers' products and processes</td>
<td>18</td>
</tr>
<tr>
<td>Buyer sophistication</td>
<td>17</td>
</tr>
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Note: Rank by countries; overall Norway ranks 20 (14 on National Business Environment, 2 on GDP pc 2003)

Source: Global Competitiveness Report 2004

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## Norway’s Relative Position

### Related and Supporting Industries

<table>
<thead>
<tr>
<th>Competitive Advantages Relative to GDP per Capita</th>
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<tbody>
<tr>
<td>Local availability of components and parts 36</td>
</tr>
<tr>
<td>Local supplier quantity 31</td>
</tr>
<tr>
<td>Local availability of process machinery 26</td>
</tr>
<tr>
<td>Local supplier quality 25</td>
</tr>
<tr>
<td>Extent of collaboration among clusters 24</td>
</tr>
<tr>
<td>State of cluster development 22</td>
</tr>
<tr>
<td>Local availability of specialized research and training services 18</td>
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Source: Global Competitiveness Report 2004
Norwegian Cluster Portfolio
Goods Exports, 1992-2002

Change in Norwegian World Export Market Share, 1992 - 2002: +0.05%

Norwegian World Export Market Share, 2002: 1.05%

Compound annual growth rate of Norwegian-world export market share, 1992 – 2002

Source: UNCTAD Trade Data. Author’s analysis.
Rivalry

• The extent of competitive pressure in many Norwegian markets is low
• Foreign companies face barriers and limited incentives to enter the Norwegian market
• Government continues to have a major role in the Norwegian economy, crowding out private investment

Clusters

• Despite strong positions in a few clusters which outperform the economy as a whole, the overall level of cluster development is low
• Norwegian regional policy and barriers to foreign investors have worked against cluster development

Demand Conditions

• Despite advanced regulations in IT and environmental quality, Norwegian demand conditions lag peer countries in stimulating innovation
Norwegian Competitiveness
Key Observations

• Norway’s high level of current prosperity **masks** serious weaknesses in important economic performance indicators

• The fundamental competitiveness of Norway **lags peer countries** and is insufficient to support even the current level of prosperity

• Norway’s competitiveness has **deteriorated** over recent years
  – It is too early to say whether the latest reforms signal a trend change

• Key **weaknesses** exist in the following areas, among others
  – Companies have insufficient presence on **foreign markets** and fail to compete on innovation
  – There is **little effective rivalry**, especially from foreign companies
  – **Government** is overly involved in business, limiting private initiative and investment
  – **Clusters** are mostly weak, which hurts productivity and dynamism
  – The quality of the education system, physical infrastructure, and the financial system are **insufficient** to attain the level of productivity and innovation needed to support current prosperity
  – Demand conditions retard **innovation**

• There is not a clear consensus that Norway has a **problem**, much yet on new directions for change
Back-Up
The Norwegian Oil Sector

Size* of Norway’s Oil Sector

- 55% of Norwegian exports (2002)
- 50% of U.S. patents by major Norwegian institutions (1997 – 2002)
- 42% of the growth in nominal GDP between 1998 and 2003 came from the oil & gas sector
  - 60% of the growth in the oil & gas sector resulted from the increase in the world market price of oil
- 20% of Norwegian GDP (2003)
- 1% of Norwegian employment (2002)

Note: Narrow definition of the “Mining and Extraction Sector” as well as unprocessed gas and oil exports
Norwegian Competitiveness: Towards An Action Agenda

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Harvard Business School

Oslo Business Summit
Oslo, Norway
October 22nd, 2004


Further information on Professor Porter’s work and the Institute for Strategy and Competitiveness is available at www.isc.hbs.edu
Norway’s Competitiveness Agenda

• Address key barriers to productivity and innovation in the Norwegian business environment
  – Competition
  – Internationalization
  – Financial markets
  – Innovative capacity

• Embrace a cluster-based approach to economic development

• Modify the strategy for regional and rural development

• Shift the roles of government, business, and other institutions in economic development
Address Weaknesses in the Norwegian Business Environment

Competition

• Address the adverse impact of government ownership on competition and productivity

• To overcome the disadvantages of a small market outside of the EU, government policy needs to be even more aggressive in creating a pro-competitive context
  – Strengthening the Competition Act alone will not be enough

• At the minimum, Norway must be completely open to international competition
Address Weaknesses in the Norwegian Business Environment

**Internationalization**

- Reduce tariff and non-tariff **barriers to imports**

- Change the impression that **foreign companies** are not welcomed as owners in Norway
  - E.g. limit interventions and public statements that oppose foreign company investments and acquisitions in Norway

- Improve **attractiveness** of Norway for foreign entrepreneurs, managers, investors, and researchers
  - E.g. review and address barriers in taxation, work permits, and other regulations
Address Weaknesses in the Norwegian Business Environment

Financial Markets

• Upgrade the quality of financial market regulation, including transparency and the rights of minority owners

• Aggressively open the market to leading foreign financial services firms

• Manage government capital invested in the domestic market to stimulate greater sophistication and competition
  – Government as a demanding customer
  – E.g. create competition among domestic and foreign funds for the administration of government equity funds
Address Weaknesses in the Norwegian Business Environment

Innovative Capacity

Norway’s Competitiveness Rank: 14

Source: Global Competitiveness Report 2003
Norwegian Innovation Policy

Recent Initiatives

• A new innovation policy was launched in late 2003
  – Driven by a cross-ministerial group led by the Department of Industry and Trade
  – Six key action areas were defined:
    • General conditions for trade and industry
    • Knowledge and competence
    • Research, development, and commercialization
    • Entrepreneurship
    • Electronic and physical infrastructure
    • New administrative structures to define innovation policy

• Key agencies in the Norwegian innovation system are being restructured
  – Reorganization of the Norwegian Research Council in September 2003 to create three instead of six divisions: Science, Innovation, and Strategic Efforts
  – Creation of Innovation Norway in January 2004 replacing the Norwegian Tourist Board, the Norwegian Trade Council, the Norwegian Industrial and Regional Development Fund (SND), and the Government Consultative Office for Inventors (SVO)
  – Creation of an Innovation Council with members from private and the public sector under the leadership of the Minister for Trade and Industry

• These initiatives are positive
• The critical task will be to deliver on their potential
Norwegian Innovation Policy
Recent Initiatives (Continued)

- Change of the **intellectual property rights** regime to encourage patenting of academic research
- Creation of “**Centers of Excellence**” in scientific research
- **R&D tax credit** scheme (SkatteFUNN) extended to larger businesses
- Launch of government-financed **seed capital** funds, operated by the cities of Oslo, Bergen, and Trondheim

- It is critically important that the seed capital funds are operated by **private operators**, selected in open competition
- The innovation policy also needs to have a strong focus on **entrepreneurship**, including university programs, business plan contests, etc.
Norway’s Competitiveness Agenda

- Address key barriers to productivity and innovation in the Norwegian business environment
- Embrace a cluster-based approach to economic development
- Modify the strategy for regional and rural development
- Shift the roles of government, business, and other institutions in economic development
The Boston Life Sciences Cluster

Cluster Organizations
MassMedic, MassBio, others

Specialized Risk Capital
VC Firms, Angel Networks

Specialized Business Services
Banking, Accounting, Legal

Specialized Research Service Providers
Laboratory, Clinical Testing

Educational Institutions
Harvard University, MIT, Tufts University, Boston University, UMass

Teaching and Specialized Hospitals

Research Organizations

Biological Products

Biopharmaceutical Products

Health and Beauty Products

Surgical Instruments and Suppliers

Medical Equipment

Dental Instruments and Suppliers

Ophthalmic Goods

Diagnostic Substances

Containers

Analytical Instruments
Clusters and Competitiveness

- **Clusters Increase Productivity / Efficiency**
  - Efficient *access* to specialized inputs, services, employees, information, institutions, and “public goods” (e.g. training programs)
  - Ease of *coordination* and transactions across firms
  - Rapid *diffusion* of best practices
  - Ongoing, visible *performance comparisons* and strong incentives to improve vs. local rivals

- **Clusters Stimulate and Enable Innovations**
  - Enhanced ability to *perceive innovation opportunities*
  - Presence of multiple suppliers and institutions to assist in *knowledge creation*
  - Ease of *experimentation* given locally available resources

- **Clusters Facilitate Commercialization**
  - Opportunities for *new companies* and *new lines of established business* are more apparent
  - *Commercializing* new products and starting new companies is easier because of available skills, suppliers, etc.

Clusters reflect the fundamental influence of *externalities / linkages* across firms and associated institutions in competition.
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

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

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

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

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

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

- **Boston**
  - Analytical Instruments
  - Knowledge Creation
  - Communications Equipment

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

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

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

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

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
Determinants of Regional Prosperity
Cluster Strength and Wage Levels, U.S. Regions

Source: County Business Patterns; Michael E. Porter, The Economic Performance of Regions”, Regional Studies, Vol. 37, 2003
Determinants of Regional Prosperity
Change in Cluster Specialization and Wage Growth, U.S. States

Annual Regional Wage Growth Rate, 1990-2001

\[ y = 8.7905x + 3.6107 \]

- \( R^2 = 0.2626 \)
- \( P\text{-value} = .0001 \)

Source: County Business Patterns; Michael E. Porter, The Economic Performance of Regions”, Regional Studies, Vol. 37, 2003
Role of Clusters in Economic Development

• Clusters are **critical engines** of economic development
  – Clusters are especially important for fostering **innovation**

• Clusters are a forum to identify **important challenges** in the business environment

• Clusters provide an opportunity for government, companies, and other institutions to work constructively together and learn **new roles** in economic development

• Clusters need to be a **core element** of any competitiveness effort
The Australian Wine Cluster
Trade Performance

Australian Wine Exports in million US Dollars

Value
Market Share

Australian Wine World Export Market Share

Source: UN Trade Statistics
The Australian Wine Cluster

History

1930
First oenology course at Roseworthy Agricultural College

1955
Australian Wine Research Institute founded

1965
Australian Wine Bureau established

1970
Winemaking school at Charles Sturt University founded

1980
Australian Wine and Brandy Corporation established

1990
Winemaker’s Federation of Australia established

1991 to 1998
New organizations created for education, research, market information, and export promotions

1950s
Import of European winery technology

1960s
Recruiting of experienced foreign investors, e.g. Wolf Bass

1970s
Continued inflow of foreign capital and management

1980s
Creation of large number of new wineries

1990s
Surge in exports and international acquisitions

## Industrial Policy versus Cluster-Based Policy

<table>
<thead>
<tr>
<th><strong>Industrial Policy</strong></th>
<th><strong>Cluster-Based Policy</strong></th>
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<tbody>
<tr>
<td>• Targets areas of perceived <strong>market demand</strong> or <strong>attractive technology</strong></td>
<td>• Leverages <strong>existing assets</strong>, history, and geographic location</td>
</tr>
<tr>
<td>• <strong>Intervenes</strong> in competition (subsidies, protection, etc.)</td>
<td>• All clusters are good</td>
</tr>
<tr>
<td>• Favors <strong>domestic</strong> companies</td>
<td>• Enables competition to be more <strong>sophisticated</strong></td>
</tr>
<tr>
<td>• Requires sustained <strong>financial commitment</strong> by the public sector</td>
<td>• Neutral on ownership</td>
</tr>
<tr>
<td>• Centralizes decisions at the <strong>national level</strong></td>
<td>• Requires sustained <strong>participation</strong> by all actors</td>
</tr>
<tr>
<td>• Has a high <strong>failure rate</strong>; short term impact but low sustainability</td>
<td>• Encourage initiative at <strong>all</strong> geographic levels</td>
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<tr>
<td></td>
<td>• Has increasing impact over <strong>time</strong>; some quick returns are possible</td>
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**Distort and impede competition**

**Enhance and upgrade competition**
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

- 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

CAON Norway 2004 Assessment 10-22-04 CK
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Upgrading Competitiveness
A Two-Pronged Approach

General Business Environment Upgrading
• Improves the economic platform for clusters
• Makes clusters stronger drivers of growth

Cluster Mobilization
• Identifies business environment weaknesses
• Enables new dialogue between private and public sectors
Norway’s Competitiveness Agenda

- Address key barriers to productivity and innovation in the Norwegian business environment
- Embrace a cluster-based approach to economic development
- Modify the strategy for regional and rural development
- Shift the roles of government, business, and other institutions in economic development
Regional Policy in Norway

• While supporting peripheral regions is a legitimate political goal, Norway has gone about it the wrong way.

• Norway has for years followed an active policy of subsidizing residents and economic activity in peripheral regions.

• Financial incentives to locate in distant regions work against cluster formation, limit efficient regional specialization, and undermine competitiveness.

• Regional policy needs to enable communities to take responsibility for their own economic destiny leveraging their own unique strengths.

• This requires accountable regional authorities with real political decision rights.
Rural Regional Economies in the United States

• The economic performance of U.S. rural regions is lagging metropolitan regions, despite significant efforts to enhance economic developments
  – However, the performance of rural regions is extremely heterogeneous and overall better than the perception

• Virtually all observers in the U.S. agree that there is a clear need to rethink the policy for rural regions

Selected Recommendations of a Recent Research Report:

• Rural economic development should focus on the unique strengths of each area, rather than concentrating on ameliorating generic weaknesses
  – Rural areas will never match urban infrastructure, services, and amenities

• The appropriate economic unit for strategy purposes must include not only rural areas but also adjacent urban centers

• Rural economic development should address and harness the efficient spatial distribution of economic activity rather than attempt to replicate urban economies

• The central government needs to provide rural regions with the necessary tools and financing mechanisms to develop and execute an effective strategy

Norway’s Competitiveness Agenda

• Address key barriers to productivity and innovation in the Norwegian business environment

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Shifting Responsibilities for Economic Development

**Old Model**

- **Government** drives economic development through policy decisions and incentives

**New Model**

- Economic development is a **collaborative process** involving government at multiple levels, companies, teaching and research institutions, and institutions for collaboration
Roles of Government in Economic Development

• Government inevitably plays an important role in shaping the business environment in which companies operate
  – A general discussion of “more” or “less” government is misguided
  – Government needs to be active in improving the quality of the business environment while reducing activities that limit competition or otherwise hurt competitiveness

• Improve the macroeconomic, political, legal, and social context
  – Establish a stable and predictable macroeconomic, legal, and political environment
  – Improve the social conditions of citizens

• Upgrade the general business environment
  – Improve the availability, quality, and efficiency of cross-cutting or general purpose inputs, infrastructure, and institutions
  – Set overall rules and incentives governing competition that encourage productivity growth

• Facilitate cluster formation and upgrading
  – Identify existing and emerging clusters
  – Convene and participate in the identification of cluster constraints and action plans to address them

• Lead a collaborative process of economic change
  – Create institutions and processes for upgrading competitiveness that inform citizens and mobilize the private sector, government at all levels, educational and other institutions, and civil society to take action
Role of the Private Sector in Economic Development

- Take an **active role** in upgrading the local infrastructure
- Nurture **local suppliers** and attract new supplier investments
- Work closely with local **educational and research institutions** to upgrade **quality and create specialized programs addressing cluster needs**
- Provide government with **information** and **substantive input** on regulatory issues and constraints bearing on cluster development
- Focus **corporate philanthropy** on enhancing the local business environment

- An important role for **trade associations**
  - Greater influence
  - Cost sharing
Norway’s Competitiveness Agenda

• Address key barriers to productivity and innovation in the Norwegian business environment
  – Competition
  – Internationalization
  – Financial markets
  – Innovative Capacity

• Embrace a cluster-based approach to economic development

• Modify the strategy for regional and rural development

• Shift the roles of government, business, and other institutions in economic development

• Creating the microeconomic foundations for a prosperous Norway in the post-natural resource era