Competitiveness: Clusters and Knowledge Creation

Presentation by
Roger L. Martin, Chairman
at
Niagara BiNational Meeting
September 27, 2002
This is a copy of the presentation given by Roger Martin in Niagara-on-the-Lake on September 27, 2002. It was the Keynote Luncheon for a day long roundtable - Growing Knowledge Clusters in Niagara BiNational: Higher Ed and Industry in Partnership.

This document provides an outline of the presentation and is incomplete without the accompanying oral commentary and discussion. It represents work in progress based on research conducted by the Institute for Competitiveness and Prosperity.

Much of the material is from the Institute’s first and second Working Papers which can be viewed at our Web site, www.competeProsper.ca

The Web site also provides more information on the Institute and the Task Force on Competitiveness, Productivity, & Economic Progress.

We ask that you acknowledge the Institute as the source if you use the material from this presentation.
GDP per Capita at Purchasing Power Parity (PPP) in $US (2000)

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<th>Rank</th>
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Note: Only countries with population over 3.8 million are included here. If all countries were included, Canada would rank 8th.
Source: OECD Main Accounts, National Data; CANSIM
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Source: OECD Main Accounts, National Data; CANSIM; Institute for Competitiveness & Prosperity analysis
Ontario versus “The Four Motors”

GDP Per Capita, 1999 (PPP)

- **Ontario**: $29,557
- **Lombardia (Italy)**: $28,958
- **Baden-Wurttemberg (Germany)**: $25,505
- **Rhone-Alpes (France)**: $21,787
- **Cataluna (Spain)**: $21,388

Source: Statistics Canada; Eurostat
Ontario in a North American Context

GDP per Capita for Select States and Provinces (2000)
(Provinces at Purchasing Power Parity in $US)

Source: OECD Main Accounts, National Data; CANSIM II; US Department of Commerce, BEA (June 2002); Institute for Competitiveness & Prosperity analysis
# Identifying 41 Clusters of Traded Industries

## Upstream Materials and Products
- Metals and Materials
  - Construction Materials
  - Metal Manufacturing
- Forest Products
  - Forest Products
- Petroleum/Chemicals
  - Oil and Gas
  - Chemical Products
  - Plastics
- Semiconductors/Computer
  - Information Technology

## Industrial and Supporting Functions
- Multiple Business
  - Education and Knowledge Creation
  - Business Services
  - Heavy Machinery
  - Financial Services
  - Motor Driven Products
  - Prefabricated Enclosures
  - Production Technology
  - Analytical Instruments
  - Heavy Construction Services
- Transportation and Logistics
  - Automotive
  - Distribution Services
  - Transportation and Logistics
- Power
  - Power Generation
  - Power Transmission and Distribution
- Office
  - Publishing and Printing

## Final Consumption Goods and Services
- Food/Beverages
  - Agricultural Products
  - Processed Foods
  - Fishing and Fishing Products
- Housing/Household
  - Building Fixtures, Equipment & Services
  - Lighting and Electrical Equipment
  - Furniture
- Textiles/Apparel
  - Textiles
  - Apparel
  - Footwear
- Health Care
  - Medical Devices
  - Pharmaceuticals and Biotechnology
- Personal
  - Leather and Sporting Goods
  - Jewelry and Precious Metals
  - Tobacco
- Entertainment/Leisure
  - Entertainment
  - Hospitality and Tourism

Results from the US Cluster Mapping Project

The Economics of Traded Clusters and Local Industries

Share of Employment
- Traded Clusters: 32%
- Local Industries: 67%
- Natural Resources: 1%

Share of Income
- Traded Clusters: 43%
- Local Industries: 56%
- Natural Resources: 1%

Average Wage ($US thousands)
- Traded Clusters: $42
- Local Industries: $26
- Natural Resources: $31

Patents per 10,000 employees
- Traded Clusters: 20.48
- Local Industries: 1.38
- Natural Resources: 6.40

Dynamics of a Cluster: Pressure and Support

**Factor (Input) Conditions**
- The underlying inputs firms draw on in competing
  - natural (physical) resources
  - human resources
  - capital resources
  - physical infrastructure
  - administrative infrastructure
  - information infrastructure
  - scientific and technological infrastructure

**Context for Firm Strategy and Rivalry**
- The context shaping the types of strategies employed and the nature of local rivalry

**Demand Conditions**
- The nature of home demand for products and services

**Related and Supporting Industries**
- The availability and quality of local suppliers and related industries

Cluster Overlap in the US Economy

Note: Clusters with borders or identical colors/shading except gray have at least 20% overlap of industries by number in both directions.

## Cluster Overlap in the United States Economy

### High Overlap
- Education and Knowledge Creation (8)
- Analytical Instruments (7)
- Aerospace Vehicles and Defense (6)
- Communications Equipment (6)
- Information Technology (6)
- Medical Devices (6)
- Lighting and Electrical Equipment (4)
- Pharmaceuticals and Biotechnology (4)
- Production Technology (4)
- Chemical Products (3)
- Automotive (3)
- Metal Manufacturing (3)

### Modest Overlap
- Plastics (2)
- Oil and Gas (2)
- Heavy Machinery (2)
- Motor Driven Products (2)
- Aerospace Engines (2)
- Hospitality and Tourism (2)
- Transportation & Logistics (2)
- Financial Services (2)
- Publishing and Printing (2)
- Power Generation (1)
- Entertainment (1)
- Processed Food (1)
- Agricultural Products (1)
- Apparel (1)
- Leather & Sporting Goods (1)
- Building Fixtures, Equipment and Services (1)
- Furniture (1)

### No Overlap
- Business Services
- Distribution Services
- Fishing and Fishing Products
- Footwear
- Forest Products
- Heavy Construction Services
- Jewelry and Precious Metals
- Construction Materials
- Power Transmission and Distribution
- Prefabricated Enclosures
- Textiles
- Tobacco

Note: Two clusters are defined to overlap if they share at least 20% of their industries by number in both directions. Numbers in brackets indicate the number of clusters overlap exists with.
The Information Technology Cluster

San Francisco-Oakland-San Jose, CA
Boise City, ID-OR
Knoxville, TN
Boston, MA
San Diego, CA
Albuquerque, NM-AZ
Austin, TX
Huntsville, AL

Location Quotient*
- 3-2
- 2-1
- 1-0

Note: *Measure of a cluster's concentration in a region relative to a cluster's concentration in the nation
Knowledge Creation Imperatives

- **Aspirations**
  - Aim for global standards and set goals accordingly
  - Compete globally for faculty and students
  - Seek unique and differentiated positioning

- **Connectedness**
  - Seek to collaborate with proximate businesses
  - Be guided in part by their needs
  - And seek to guide them with your research-based insights