

Comparison of Ontario and New Jersey Education and Knowledge Creation Clusters

Presented to:

Jim Milway, Institute for Competitiveness and Prosperity

Prepared by:

Wilfrid Laurier MBA Consulting Team

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Education and Knowledge Creation in Ontario

- **Established:** 1874 (Ontario School of Agriculture)
- **Main reason for birth:** The Ontario government purchased a five hundred-acre farm to form its new School of Agriculture
- **Current Cluster Capacity:** Enrollment of approximately 110,000 FTE undergraduate and 11,400 graduate students; 12 U.S. patents per year (2001); Patents per \$1 million of research is 0.04
- **Cluster Definition:** Southwestern Ontario - Kitchener-Waterloo-Guelph, Hamilton, London

Ontario: Schools in Study

School	Location	Year Founded
Conestoga College	Waterloo	1967
Fanshawe College	London	1969
McMaster University	Hamilton	1890
Mohawk College	Hamilton	1947
Wilfrid Laurier University	Waterloo	1911
Waterloo University	Waterloo	1957
University of Guelph	Guelph	1874
University of Western Ontario	London	1878

Of Interest in Ontario

- Approximately 50% of 20-24 year olds in Ontario seek higher education
- Educational institutions are resorting to competition on the basis of differentiation where possible.
- The University of Waterloo started Canada's first co-op program in 1957. The program is now one of the largest in the world with approximately 11,000 students participating
- The cluster's region is strategically located within a one to two-hour drive of the Greater Toronto Area and within three hours of Detroit–Windsor

Education and Knowledge Creation in New Jersey

- **Established:** 1746 (Princeton University, formerly known as College of New Jersey)
- **Main reason for the birth:** The school was chartered by the governor in the name of King George II "for the Education of Youth in the Learned Languages and in the Liberal Arts and Sciences"
- **Current Cluster Capacity:** Enrollment of approximately 73,600 FTE undergraduate and 14,300 graduate students; 56 U.S. patents per year (2001); Patents per \$1 million of research is 0.10
- **Cluster Definition:** Central New Jersey: Mercer and Middlesex Counties

New Jersey: Schools in Study

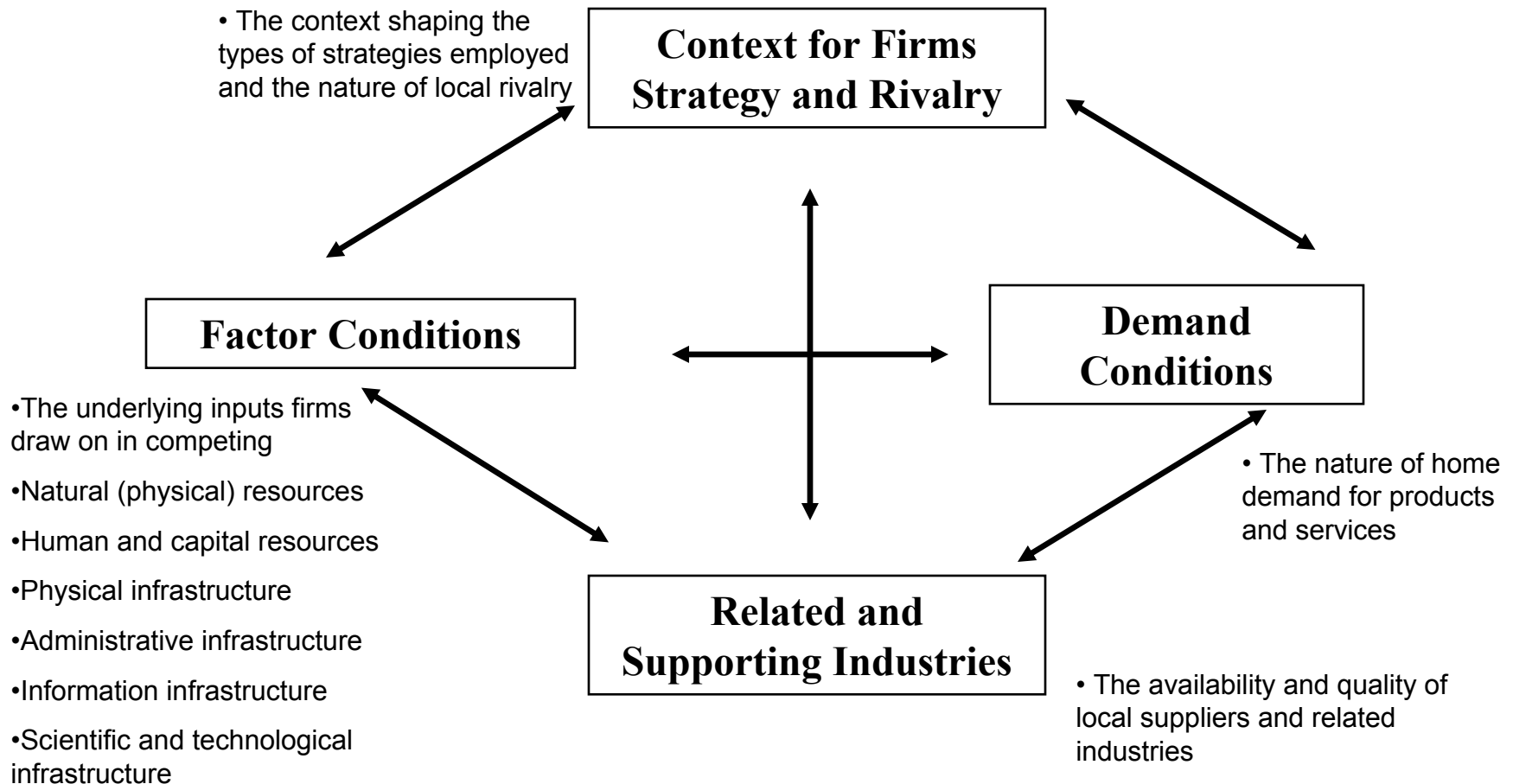
School	Location	Year Founded
Mercer County Community College	Trenton	1966
Middlesex County Community College	Edison	1966
New Jersey Medical and Dental University	Newark	1970
Princeton University *	Princeton	1746
Rider University *	Lawrenceville	1865
Rutgers University	New Brunswick	1766
The College of New Jersey	Ewing	1855
Thomas A. Edison Community College	Trenton	1972

* Private Universities

Of Interest in New Jersey

- The cluster's region is strategically located within a one hour drive to New York City and Philadelphia
- Approximately 30% of people aged over 25 hold a bachelor's degree or higher
- Princeton University was the fourth college to be established in British North America, after Harvard, William and Mary, and Yale. Rutgers University was 8th
- Together, Princeton faculty and alumni have won 27 Nobel Prizes (14 and 13 respectively)

Porter's Diamond – An Explanation



Factor Conditions

Scale (-3, 3)	Ontario	New Jersey
General Factors	1 - Weak Advantage	2 – Advantage
Specialized Factors	1 - Weak Advantage	2 – Advantage

- **Highly trained faculty are an essential input for establishing high quality programs and attracting research funding**
- **The New Jersey cluster has the advantage of being within commuting distance to both New York City and Philadelphia. The Ontario cluster is close to Toronto**
- **The New Jersey cluster offers higher average salaries relative to both the average salaries across the United States and to the Ontario cluster. Higher average salaries are assumed to attract top faculty**
- **The percentage of highly qualified people* (HQP) in the New Jersey cluster (33.5%) is greater than both the percentage of HQP in the state of New Jersey (29.8%) and the percentage of HQP in the Ontario cluster (22.0%)**
- **Government funding for operations in the New Jersey cluster is approximately \$15,871 (US\$) per FTE vs. \$6,849 (US\$) per FTE in the Ontario cluster**

* HQP – People aged 25 to 64 (25 and over in New Jersey) that have attained a bachelor's degree or higher. A bachelor's degree refers to a 4 year degree.

Demand Conditions

Scale (-3, 3)	Ontario	New Jersey
Local Demand Size	0 - Neutral	2 – Advantage
Local Demand Qualities	0 - Neutral	2 – Advantage

RESEARCH EXPENDITURE:

- **New Jersey's total research funding almost doubles Ontario's (\$537 to \$275 million). Furthermore, the population of the New Jersey cluster is smaller, therefore on a per capita basis the discrepancy is even larger (\$488 to \$170)**
- **The output in research per \$1 million in research funding (U.S. Patents, Licenses, Start up companies, Invention disclosures) is similar in both clusters, indicating similar levels of productivity**

NUMBER OF STUDENTS:

- **In Ontario the percentage of people ages 20-24 seeking higher education is 50%, while in New Jersey it's 60%**
- **The Ontario cluster is a net importer with 25% of its student population coming outside of the province, while New Jersey is a net exporter with 58% of students leaving the state. Ontario has a greater proportion of available student spaces relative to the population size of Ontario**
- **The sophistication of students (standardized admission scores) on average is slightly higher in the U.S., but the range in the U.S. is more significant (NJ GMAT – 790 to 512 vs. ON GMAT 660 to 600). The TOEFL also confirms this trend (NJ 600-580 and ON 580-550)**

Related and Supporting Industries

Scale (-3, 3)	Ontario	New Jersey
Suppliers	0 – Neutral	0 - Neutral
Related Industries	1 - Weak Advantage	2 - Advantage

- **Colleges and universities require faculty as their main input**
- **Both clusters have good sources of other materials and services supplies easily accessible**
- **Complex and stringent immigration laws make it difficult for schools in both clusters to hire foreign faculty members**
- **The New Jersey cluster has an advantage over Ontario in terms of both competitive related industries and competitive complementary related industries. The New Jersey cluster's concentration for both measures is well above the concentration levels across the state**
- **Ontario's co-op programs give it an advantage over New Jersey but moderate local placement rates weaken the benefits of these co-op programs to the region**

Firm Strategy and Rivalry

Scale (-3, 3)	Ontario	New Jersey
Rivalry	1 - Weak Advantage	1 - Weak Advantage
Cooperation	1 - Weak Advantage	1 - Weak Advantage

- **Small variation in the Ontario cluster tuition fees (3% in Arts, 12% in Engineering) along with the inability of universities to freely set tuition fees, motivates institutions to resort to competition on the basis of non-price differentiation**
- **The under funding of universities, a weaker role for the private sector (compared to the U.S.), and intense competition for research chairs and qualified faculty are driving the rivalry within the Ontario cluster. The New Jersey cluster is not under the same pressure (two-tier system)**
- **Ontario universities have introduced more new programs in the period between 2000 and 2004 compared to their New Jersey counterparts**
- **Higher education is extremely regulated in Ontario. Even with the passage of Bill 132, it is still significantly hard to set up degree granting universities. New Jersey has a rigorous process as well, but not as difficult or lengthy (one year)**
- **Cooperation among educational institutions in both clusters is evident. However, there is no specific association that is both local to the cluster and actively promoting the cluster**

Firm Strategy and Rivalry (cont'd)

Scale (-3, 3)	Ontario	New Jersey
Strategy and Structure	1 - Weak Advantage	0 - Neutral
Local Investment Context	0 - Neutral	1 - Weak Advantage

- **There does not seem to be an overwhelming unique local strategy that helps the institutions compete and innovate aside from the institutions' focus on areas in which they already excel, on programs leading to particular levels or types of qualifications, or on programs related to their key areas of research activity**
- **In the Ontario cluster, some institutions better utilize co-op education to provide value added education experiences to their students (University of Waterloo). Some universities place significant emphasis on research and innovation (McMaster)**
- **The University of Waterloo is the only university in both clusters that does not share equity in the ownership of faculty's patents and intellectual property**
- **The local investment context in New Jersey is stronger than that found in Ontario. New Jersey general tax structure and student tax credits are favourable compared to Ontario**

Evolution

Scale (-3, 3)	Ontario	New Jersey
Primary reason behind cluster birth	5 – Other (Government)	5 – Other (Government)

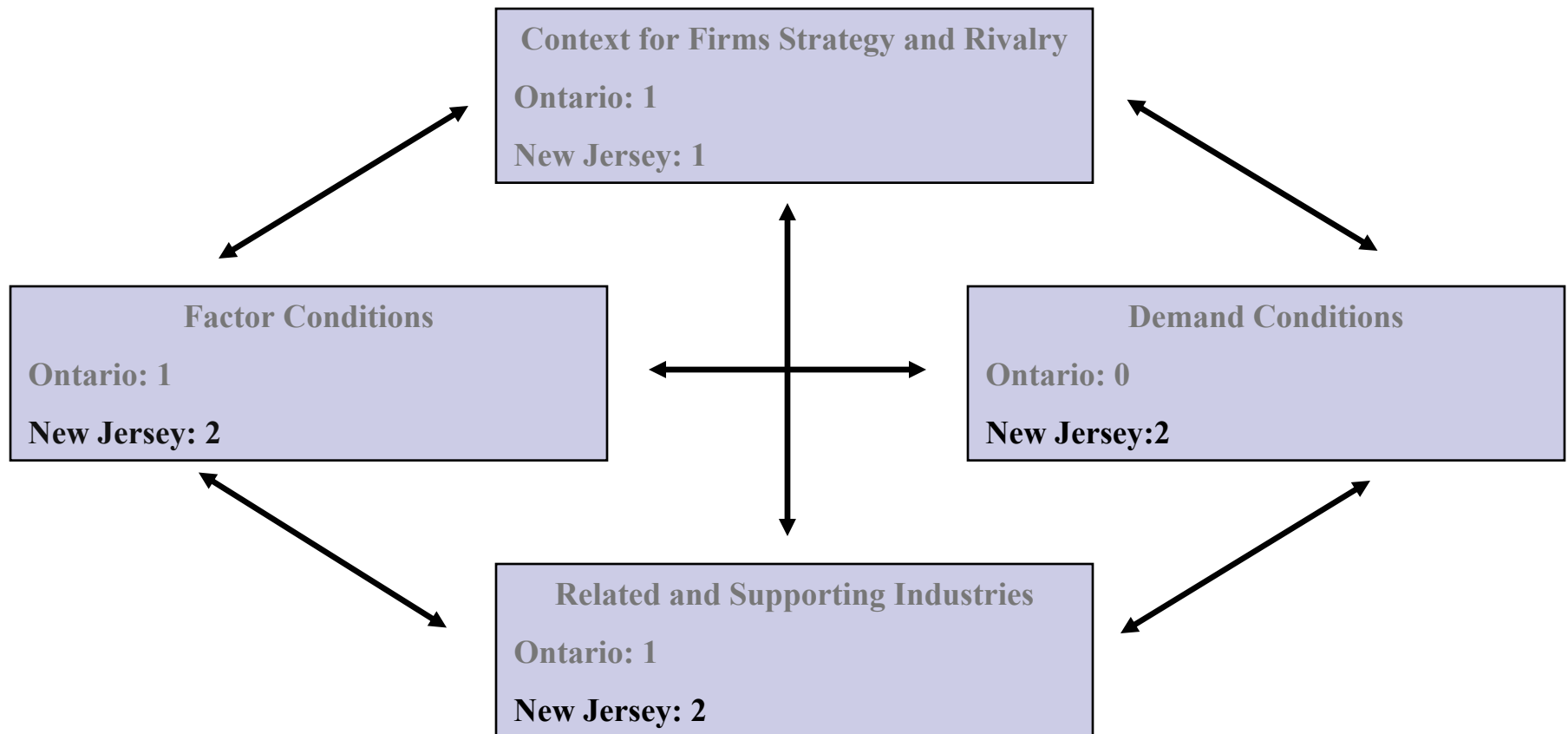
- **The Ontario School of Agriculture (name later changed to the University of Guelph) was founded when the Ontario government purchased a farm for the purpose of opening an agricultural school**
- **Princeton University was chartered by the governor in the name of King George II. Formerly known as the College of New Jersey, it was moved to Princeton from Newark because Nassau Hall, one of the largest buildings in colonial America, was available to support the growing number of students and tutors**

Competitiveness

Scale (-3, 3)	Ontario	New Jersey
Indicators of Competitiveness	0 – Internationally Significant	1 – Among World's Top 10

- Demand for post-secondary education among young people is higher in New Jersey than in Ontario
- Ontario's enrolment is growing at moderately higher rates compared to New Jersey. Higher growth rates imply that Ontario is attracting more students
- The New Jersey cluster benefits from higher capita research spending (US\$404) vs the Ontario cluster (US\$174)
- The international student body in attendance in both clusters was relatively similar making up less than 5% of all undergraduate students
- There is remarkable homogeneity in programs offered by the institutions within the Ontario cluster, whereas the New Jersey cluster offers more specialized programs and has institutions that are more focused in their offering
- New Jersey's cluster appears to be more tightly linked to local complementary industries

Key Comparisons



Key Comparisons

Category	Ontario	New Jersey
Competitiveness	0 – Internationally Significant	1 – Among World’s Top Ten
Diamond		
Factor Conditions	1 - Weak Advantage	2 - Advantage
Demand Conditions	0 - Neutral	2 - Advantage
Related & Supporting Industries	1 - Weak Advantage	2 - Advantage
Firm Strategy & Rivalry	1 - Weak Advantage	1 - Weak Advantage
Evolution	5 - Other (Government)	5 - Other (Government)
Primary Reason Behind Competitiveness	1 – Factor Conditions	1 – Factor Conditions & 2 – Demand Conditions

Main Reason Behind Competitiveness

	Ontario	New Jersey
Primary reason behind competitiveness in order of importance	<ul style="list-style-type: none"> ■ Factor ■ Firm Strategy and Rivalry ■ Related and Supporting Industries ■ Demand 	<ul style="list-style-type: none"> ■ Factor ■ Demand ■ Related and Supporting Industries ■ Firm Strategy and Rivalry

- **The percentage of highly qualified people (HQP) in the New Jersey cluster (33.5%) is greater than the percentage of HQP in the state of New Jersey (29.8%) and the Ontario cluster (22.0%)**
- **The New Jersey cluster offers higher average salaries relative to both the average salaries across the United States and to the Ontario cluster. Higher average salaries are assumed to attract top faculty**
- **Sophisticated demand in New Jersey encourages more research expenditure. Per capita research spending in the New Jersey cluster is \$404 (US\$) compared to \$174 (US\$) in the Ontario cluster**
- **The New Jersey cluster has an advantage over Ontario in terms of both competitive related industries and competitive complementary related industries. The New Jersey cluster's concentration for both measures is well above the concentration levels across the state**
- **60% of New Jersey high school students seek higher education compared to 50% in Ontario**

Key Challenges and Issues

- Despite strong student interest in co-op and internship programs, New Jersey schools have been unable to secure the necessary resources to develop and promote these programs
- Complex immigration laws make it difficult for schools in both clusters to hire foreign faculty members
- Government regulations and tuition controls limit school's operating flexibility
- Cross cluster competition is a major factor in both clusters
- A large proportion of students from New Jersey attend schools out of state (58%), forgoing lower in state fees. New Jersey schools need to find ways for attracting local students



Key Opportunities

- Co-op programs in the Ontario cluster should serve as a valuable mechanism for knowledge transfer to related industries in the business community
- Expand joint programs between schools to facilitate sharing of resources and augment growth
- Reduce reliance on public funding by forming partnerships with industry
- Increase foreign marketing to open schools up to new markets