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REGIONAL INNOVATION

How to Analyze a Region's Innovativeness?
Theories and Methods of Regional Innovation

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Seminar, Summer 2020, Coaching 2 (Unit 2: Quantitative Tools) 04.05.2020

GEFÖRDERT VOM
Bundesministerium für Bildung und Forschung

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INSTITUT FÜR ARBEITSWISSENSCHAFT
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in STUDIES

Contents of Coaching 2 (Continued)

~~Part 1 | Theory and Methods to the Regional Dynamic Capabilities View~~

Part 2 A. | Cluster Analysis and Porters Diamond: What Makes a Region Competitive?

Part 2 B. | Ecosystems and How to Measure Them

Part 3 | It‘s OWL - Entrepreneurial Ecosystems

Learning Outcomes

- Understanding and Appreciating the **Concept of Agglomeration** and its Effects
- Grasping Different **Quantitative Approaches to Regions**
- Learning to Distinguish Between and Compare Different Theories and Concepts
- Learning about **Secondary Data Research and Evaluation in Regional Context**

Cluster Analysis and Porter‘s Diamond

What makes an Industry Competitive?

3 | Cluster Analysis and Porter's Diamond

Antecedents to Porter

- **Agglomeration** *(lat.: agglomerare = to pile up):* a city and its vicinity
  - i.e. core city and suburbia

Farhauer & Kröll 2014: 256

- Agglomeration from an **Economic Perspective**
- "spatial concentration of elements (firms) in an area"
- "agglomeration is the result and consequence of **location advantages** […] through the concentration of enterprises of similar industries (**localization economies**) and different industries (**urbanization economies**)"
  - E.g. Industry Clusters, Shopping Malls, CBDs
  - It means as well the process of agglomeration and densification of urban areas and business/industry zones and the dynamics behind

Gabler Wirtschaftslexikon n.d.

3 | Cluster Analysis and Porter's Diamond

Antecedents to Porter: Agglomeration Effects

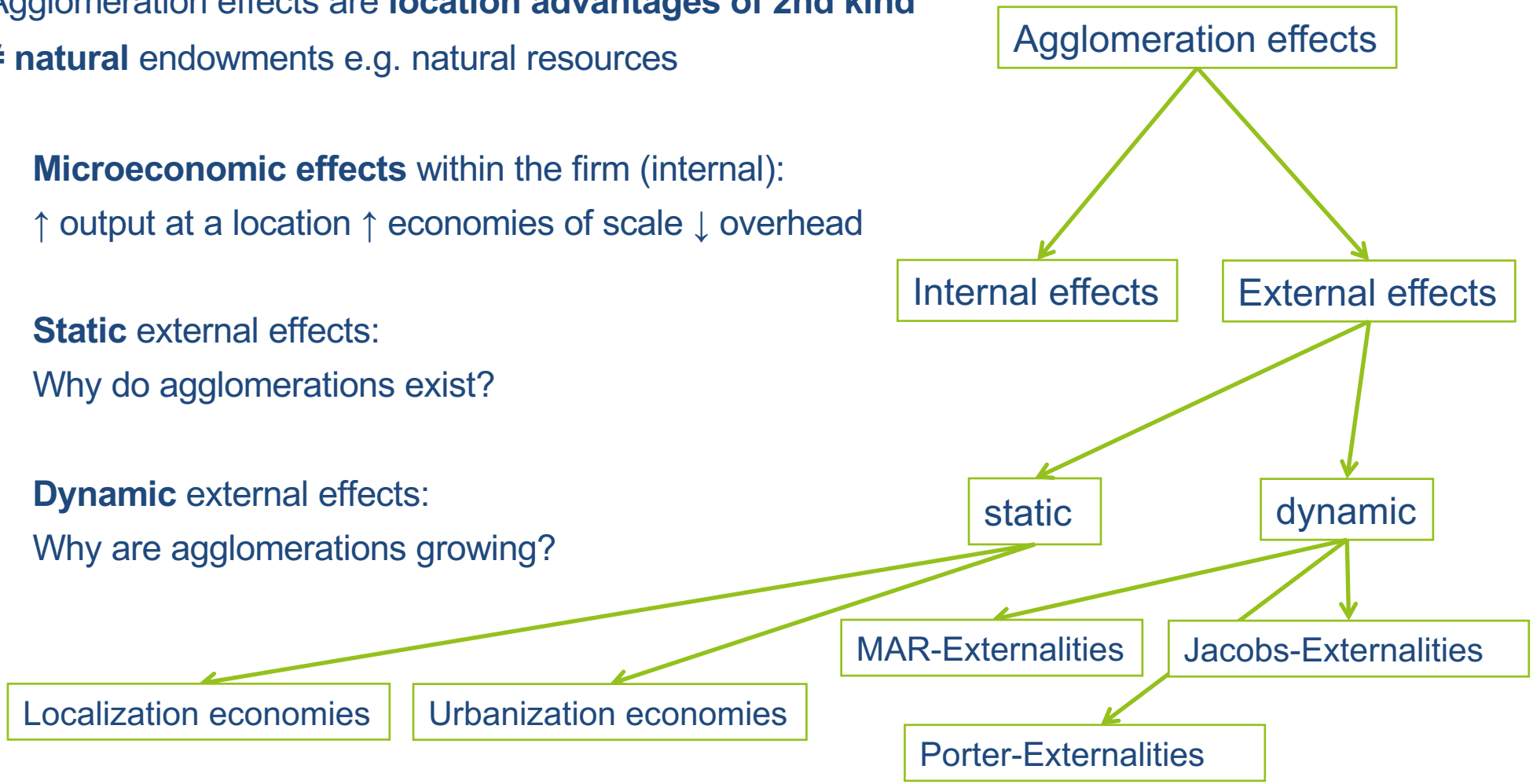
Agglomeration effects are **location advantages of 2nd kind**

≠ natural endowments e.g. natural resources

- **Microeconomic effects** within the firm (internal):
- ↑ output at a location ↑ economies of scale ↓ overhead

- **Static** external effects:
- Why do agglomerations exist?

- **Dynamic** external effects:
- Why are agglomerations growing?



Farhauer & Kröll 2014: 55-57, 112-120; Bathelt & Glückler 2002: 128

3 | Cluster Analysis and Porter's Diamond

Antecedents to Porter: Localization vs. Urbanization

Localization Economies

- Effects of agglomerating a certain industry
- spatial **proximity of suppliers**
- **Specialized workforce**
- Mutual use of **public goods**
- Diversity in prices and quality for consumer → diverse demand

Urbanization Economies

- Effects through diverse regional economy
- **Large and diverse** base of **suppliers, workforce, consumers**
- Mutual use of **public goods**

Farhauer & Kröll 2014: 55-57, 112-120; Bathelt & Glückler 2002: 128

3 | Cluster Analysis and Porter's Diamond

Antecedents to Porter: Knowledge Distribution and Transfer

MAR-Externalities

Knowledge spillover through agglomerating a certain industry

e.g. **face-to-face contacts, spin-offs**

Jacobs-Externalities

Knowledge spillover through diverse regional economy

Porter-Externalities

Knowledge-based externalities same as MAR & Jacobs,

puts focus on internal competition in agglomerations

→ competition ↑

→→ Innovation activity ↑

→→→ (regional) growth ↑

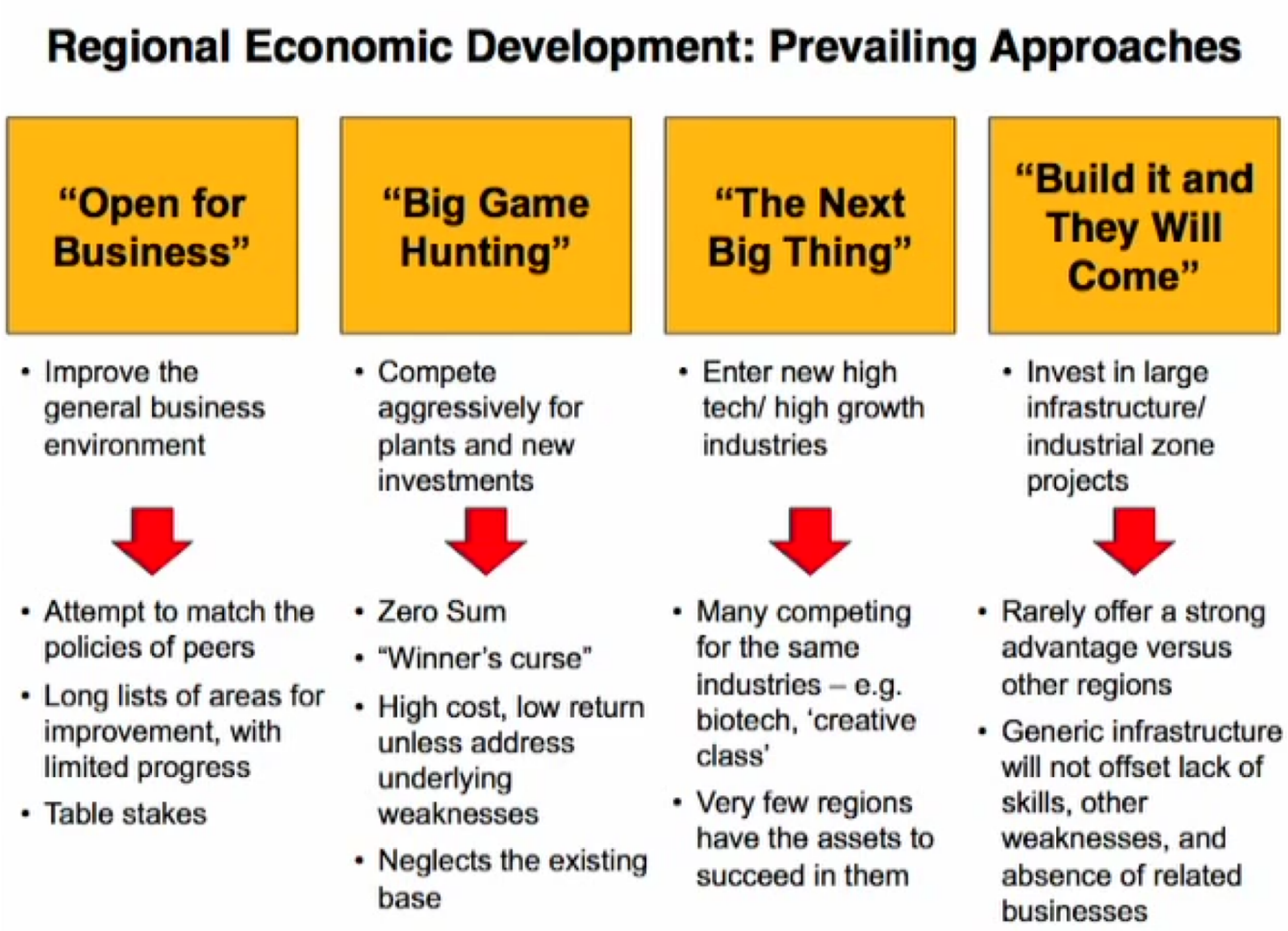
Farhauer & Kröll 2014: 55-57, 112-120; Bathelt & Glückler 2002: 128

Types of Knowledge Transfer

- Basic Transfer
- Personnel Transfer
- Spin-Offs
- Interactive Transfer

Warnecke 2016: 16

3 | Regional Development Strategies
How It Does Not Work According to Porter



Porter 2014, Youtube.

3 | Clusters and Competition
How It Does Work According to Porter

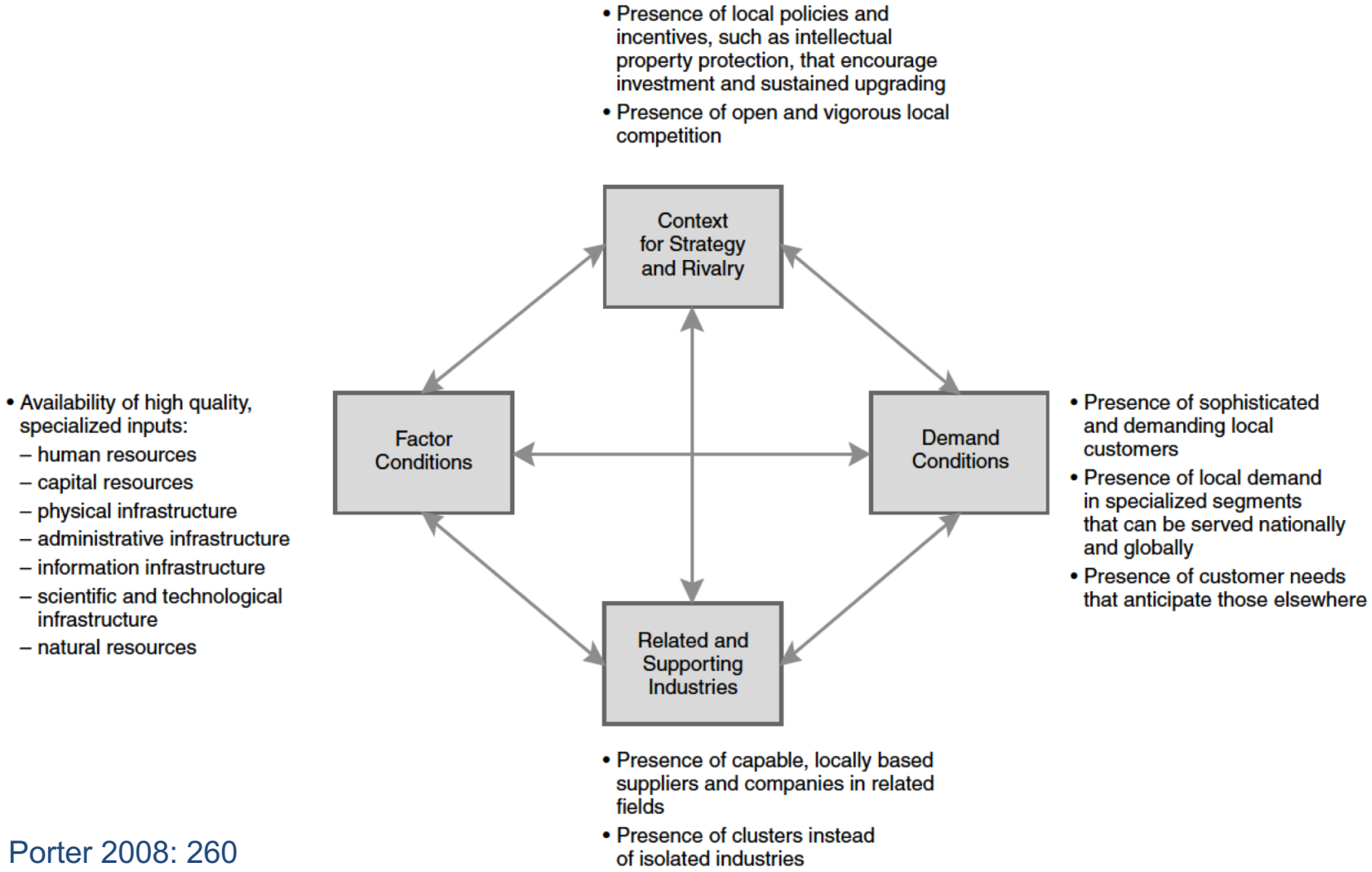
Guiding Idea: An increasingly complex, knowledge-based, and dynamic economy needs a new approaches.

- Key factors in **Cluster Theory**: **competition** and **cooperation**
- "A cluster is a geographically proximate group of interconnected companies and associated institutions in a particular field, linked by **commonalities** and **complementarities**"
- **Geographic scope** of a cluster can range from a single city or state to a country or even a network of neighboring countries
- **Cluster boundaries** should encompass all firms, industries, and institutions with strong linkages, whether vertical, horizontal, or institutional

Porter 2008: 215; Porter 2014, Youtube; Porter 1998

3 | How to Analyze a Region?

Method: Porter's Diamond / Case Study

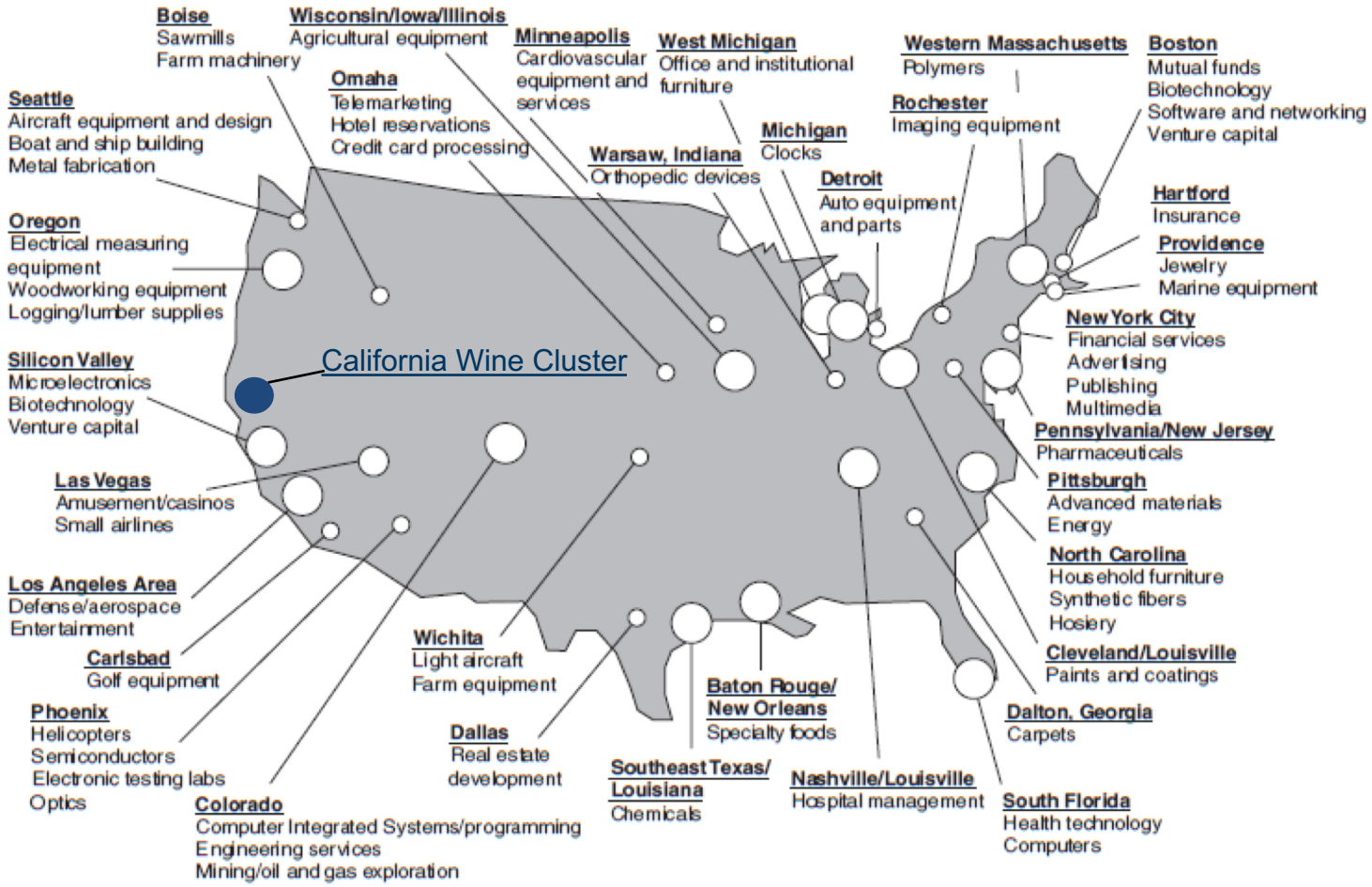


Porter 2008: 260

3 | Clusters and regional development

Clusters in the USA

Selected Regional Clusters of Competitive U.S. Industries



Porter 2008: 245

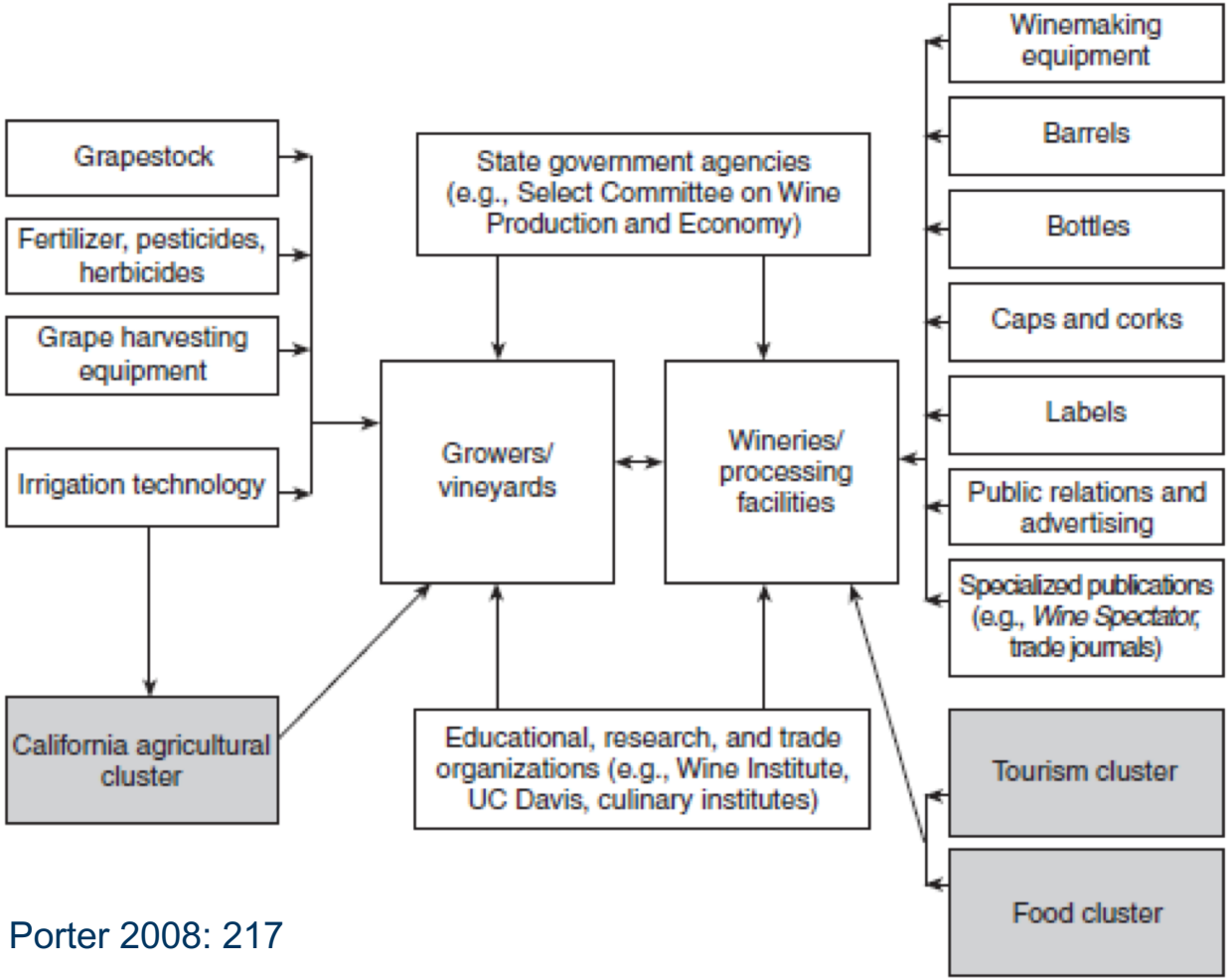
3 | Clusters and Competition

Mapping a cluster

How to identify a cluster?

Open Source

The California Wine Cluster Map



Porter 2008: 217

3 | Cluster Analysis: The Process I

An exemplary table of contents

The case of the California wine cluster

Demand Conditions?

- The Californian economy, The history of the California wine cluster
- US wine consumption
- Grape production
  - Growing regions
  - Vineyard operations
  - Wine production
  - …(detailed aspects of wine production)

Factor (Input) Conditions?

Related and Supporting industries?

- Distribution, Sales and Marketing, Technology development, Financing
- Competition
  - Various competitors on a global scale

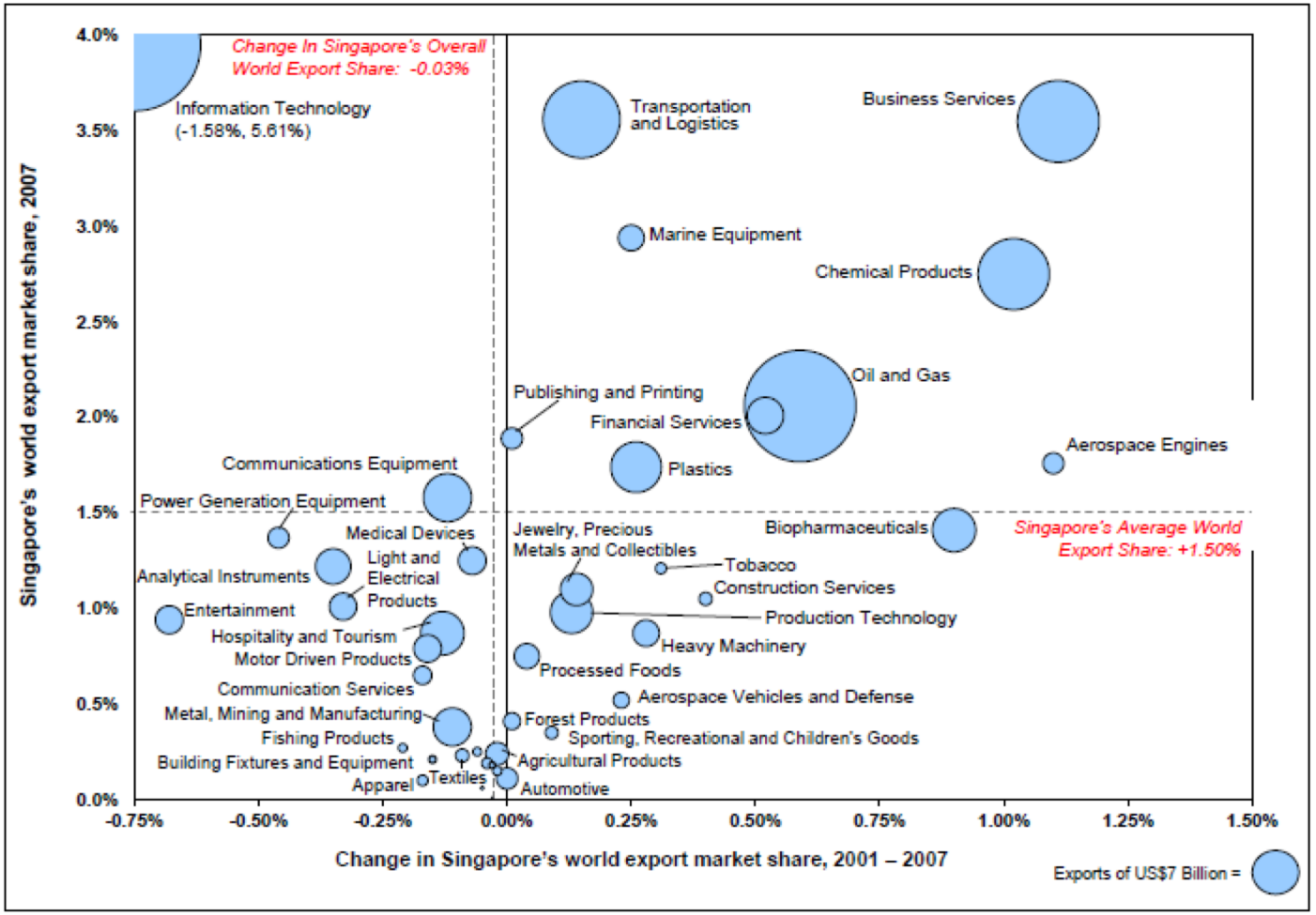
Context for firm strategy and rivalry?

3 | Cluster Analysis: The Process II

Methods

- Relies heavily on **Secondary Data and Document Analysis**
- Providing/Starting with **Historic Perspective**
- **Telling a Story**: leaders and pacemakers (e.g. the president of a state who proposed a new economic strategy)
- **Case Studies** with explorational character
- **Visualized** secondary data

Exhibit 4 Singapore National Cluster Export Portfolio, 2001 to 2007



Source: Prof. Michael E. Porter, International Cluster Competitiveness Project, Institute for Strategy and Competitiveness, Harvard Business School; Richard Bryden, Project Director. Underlying data drawn from the UN Commodity Trade Statistics Database and the IMF BOP statistics.

3 | Methodological implications of Cluster Analysis and Porter's Diamond

Example Demand Conditions in the Wine Cluster: Secondary Data

Exhibit 1 World Wine Market Consumption by Major Country, 1996

	Total		Per Capita		1996 Imports[a]						1996 Off-Premise Consumption[b]		
Country	1996 Gallons (mil)	CAGR 1991-96	1996 Gallons	CAGR 1991-96	Gallons (mil)	% of Country (volume)	% of World (volume)	Import Value ($ mil)	% of World (value)	Value per Gallon	% of Country (volume)	Retail Sales ($ bil)	Sales per 750 ml
France	940.7	(0.7%)	16.12	(1.2%)	139.7	14.9%	10.1%	$520.0	4.6%	$3.72	71.9	$14.07	$3.69
Italy	866.5	(1.4)	15.14	(1.5)	7.9	0.9	0.6	155.0	1.4	19.72	85.9	5.38	1.35
U.S.	541.8	3.4	2.01	2.4	93.9	17.3	6.8	1,554.5	13.6	16.56	78.3	10.54	6.22
Germany	500.2	(0.1)	6.10	(0.6)	296.8	59.3	21.4	1,848.7	16.2	6.23	79.5	5.62	3.01
Spain	404.2	(1.9)	10.19	(2.0)	31.7	7.8	2.3	80.2	0.7	2.53	43.4	0.86	1.26
Argentina	358.2	(5.3)	10.17	(6.5)	1.3	0.4	0.1	12.6	0.1	9.35	85.0	1.73	1.14
South Africa	221.0	(2.6)	5.21	(4.7)	4.4	2.0	0.3	9.5	0.1	2.17	66.1	0.45	0.31
U.K.	187.9	1.7	3.22	1.5	195.5	104.1	14.1	2,077.2	18.2	10.62	80.0	7.41	8.68
Portugal	155.0	0.8	15.80	0.9	15.4	9.9	1.1	51.0	0.4	3.31	90.0	0.73	2.19
Romania	142.6	1.3	6.29	1.8	1.5	1.1	0.1	1.8	0.0	1.21	NA	NA	NA
Russia	117.4	NA	0.79	NA	66.1	56.3	4.8	386.8	3.4	5.85	83.0	2.58	2.08
China	111.0	6.9	0.09	5.5	2.8	2.5	0.2	44.7	0.4	16.12	NA	NA	NA
Australia[c]	87.3	1.6	4.83	0.5	3.8	4.3	0.3	49.2	0.4	13.06	42.9	1.31	2.98
Switzerland	79.4	(0.3)	10.99	(1.3)	49.0	61.7	3.5	603.6	5.3	12.32	62.8	0.94	3.53
Austria	70.3	0.2	8.67	(0.6)	8.5	12.0	0.6	73.4	0.6	8.68	74.2	1.93	6.03
Hungary	68.7	(2.8)	6.83	(2.3)	1.4	2.0	0.1	3.2	0.0	2.31	NA	NA	NA
Belgium-Lux.	61.5	0.3	5.81	(0.1)	64.4	104.8	4.6	680.2	6.0	10.56	56.5	1.09	3.89
Chile	60.5	(1.4)	4.20	(3.0)	0.2	0.3	0.0	1.0	0.0	6.35	54.7	0.45	1.02
Brazil	59.4	(7.6)	0.37	(8.8)	6.2	10.4	0.4	43.1	0.4	6.97	NA	NA	NA
Netherlands	53.7	(2.8)	3.45	(3.4)	57.4	106.7	4.1	561.2	4.9	9.78	NA	NA	NA
Canada	53.7	2.2	1.81	1.1	45.8	85.3	3.3	385.0	3.4	8.41	75.9	1.45	4.18
Japan	53.0	8.5	0.42	8.2	29.0	54.7	2.1	514.1	4.5	17.74	38.3	0.56	6.00
Other	691.2	(3.8)	—	—	267.3	38.7	19.2	1,747.6	15.3	6.54	NA	20.55	2.93
World	**5,885.2**	**(0.6%)**	—	—	**1,389.7**	**23.6**	**100.0%**	**$11,403.8**	**100.0%**	**$8.21**	**NA**	**$77.65**	**$2.91**

Sources: Food and Agricultural Organization (FAO) of the United Nations and Euromonitor (for off-premise consumption data).

3 | Methodological implications of Cluster Analysis and Porter's Diamond

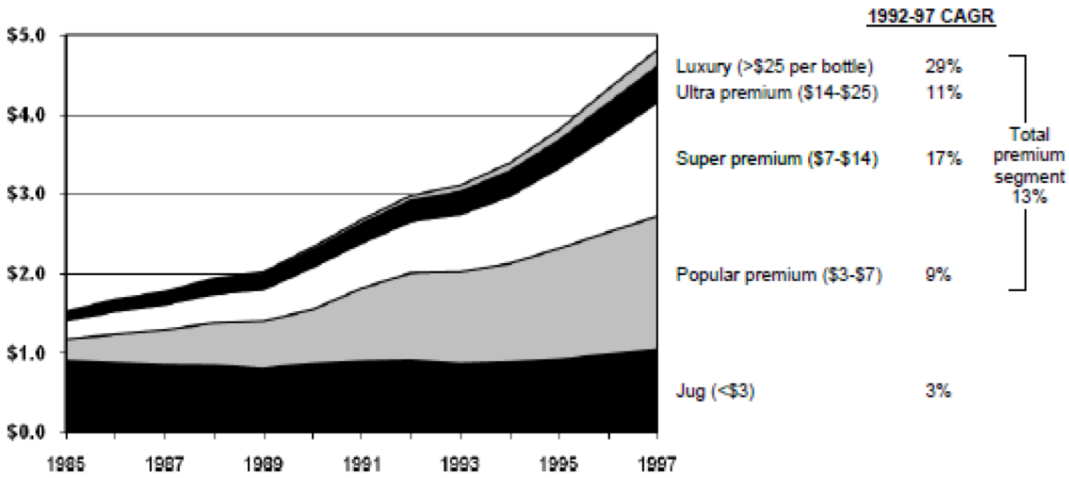
Example Demand Conditions in the Wine Cluster: More Secondary Data

Exhibit 2 Wine Consumption in the United States (millions of gallons)[a]

	1996	1997	1997 % of Total	% Change 1996-97
By Type				
Table				
California	339	336	64%	(1%)
Other table	104	126	24	21
Dessert & fortified	32	31	6	(2)
Sparkling	30	30	6	1
Total	505	523	100%	4%
By Origin				
California	375	372	71%	(1%)
Other states	43	40	8	(7)
Foreign wine imported in bottles				
Italy	34	36	7%	7%
France	21	27	5	25
Chile	10	12	2	18
Australia	5	7	1	37
Other countries	16	17	3	5
Subtotal	86	98	19%	14%
Foreign bulk wine bottled in U.S.	1	13	2	++
Total	505	523	100%	4%

Source: Adapted from Gomberg, Fredrikson & Associates, "1997 Annual Wine Industry Review," Gomberg-Fredrikson Report (February 28, 1998): 17-12.

Exhibit 3 Domestic California Table Wine Revenues by Price Category, 1985-1997 (in billions)[a]



Source: Adapted from data from the Robert Mondavi Corporation and Gomberg, Fredrikson & Associates.

[a]Revenue to California wineries; excludes wholesale and retail mark-ups.

3 | Methodological implications of Cluster Analysis and Porter's Diamond

Example Early Findings from Deduced Data

- **Demand**: Demand for wine is growing in the US
- **Domestic Competition**: California is the biggest wine producer in the US
- **International Competition**: main global competitors on the US wine market are Italy, France, Chile, Australia
- **Profitability and Margins**: premium wine products offer increasingly higher revenue than jug wine
- →**Takeaways for Cluster Members**: Growing market and increasing demand for premium wines ask for better technology, innovation and better firm strategy to gain/keep market shares

3 | Methodological implications of Cluster Analysis and Porter's Diamond

Relevant variables, indicators and research methods

Variables	Operationalization / Indicator	Research Method and Sources of Information
Demand Conditions	• Quantity vs. Sophistication/Quality: and demanding local costumers (Size and quality of the market) • Unusual local demand in specialized segments that can be served globally	**Industry reports, statistics on various scales**, when derived from historical conditions see path dependency
Context for Firm Strategy and Rivalry	• Local context encouraging investment and sustained upgrading • Strong competition among locally-based rivals	Industry reports, **newspaper reports**, when derived from historical conditions see path dependency **Expert interviews with entrepeneurs and intermediates**
Related and Supporting Industries	• Presence, quantity and quality of capable, locally-based suppliers, • Presence, quantity and quality of competitive related industries	Industry reports, regional statistics
Path dependency	• Assumption: foundation of succesful clusters often lie in the past: historic conditions? Learnings and possible transfer from other regions?	**Historical statistics, yearbooks, chronicles, memoirs = document analysis**
Important actors	• Strong, outstanding personalities, pushing the cluster development with their personal involvement	newspaper reports, **expert interviews**

3 | Methodological implications of Cluster Analysis and Porter's Diamond

Relevant variables, indicators and research methods

Variables	Operationalization / Indicators	Research methods and Sources of Information
Factor (Input) Conditions	• Factor (input) quantity and cost • natural resources, physical infrastructure • human resources (workforce) and qualification • capital availability • administrative infrastructure • Information (technology) infrastructure • scientific and technological infrastructure • Factor quality and specialization • ...	Document analysis, **Industry reports, regional statistics** **National and international statistics for measuring competition and success** **Public announcements and reports** when derived from historical conditions see path dependency (next slide) **e.g. number of high skilled employees, number of research facilities, patent output, research budgets, grow rates, number of start-ups, share of industry X in national/global competition, consumption of a good…**
Broad Overview of Data Pools (By Source of Origination)	**Supranational** • EuroStat (NUTS-Regions) and other EU Reports: e.g. Regional Competitiveness Index, Flash Eurobarometer Survey • OECD; G8 etc. • IMF, World Bank, World Economic Forum: e.g. Global Competitiveness Report • Global Entrepreneurship Research Association **National** • National Data Bureaus and Statistical Offices (or any type of institutionalized data aggregators) • Publications by Ministries: e.g. DeStatis; U.S. Clustermapping Tool, U.S. Census Bureau	**Local and Regional** • Local Archives and Libraries, Reports, Documents, (Business) Newspapers **Data from the Private Sector (Treat with Caution!!!)** • Market Research Institutes and Consulting Firm Publications: e.g. Niehlsen, Statista, Deloitte

3 | Cluster Summary

- **Cluster Theory..**
- is based on assumptions and findings on **agglomeration** of economic activity suggesting predominantly positive effects of clustering **similar or related** economic value creation.
- provides a suitable concept for **diagnostic** purposes: valuable instrument for assessing a region and determining relevant actors, events and resources. This is particularly suitable for analyzing a region's status quo and the process that produced the status quo (historic perspective).
- **Cluster Analysis..**
- is largely based on **secondary data** from various sources.
- is able to deliver potent **results for guiding leaders and poli**cy-makers in trying to ameliorate regional competitiveness: goal of **successive upgrading**.
- can be applied to a **diverse portfolio** of economic activity and industries.
- frequently points out how clusters perform differently, are in **different stages** of their development, and are impacted and guided by their respective **histories**.
- provides a rather **rigid framework** for collecting information on economic activity and **making sense** of it.
- involves the **cluster diamond and cluster map.**

3 | Coaching 2 (Part 2 A: Clusters)

Learning Outcomes

- Understanding and Appreciating the **Concept of Agglomeration** and its Effects
- Grasping Different **Quantitative Approaches to Regions**
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