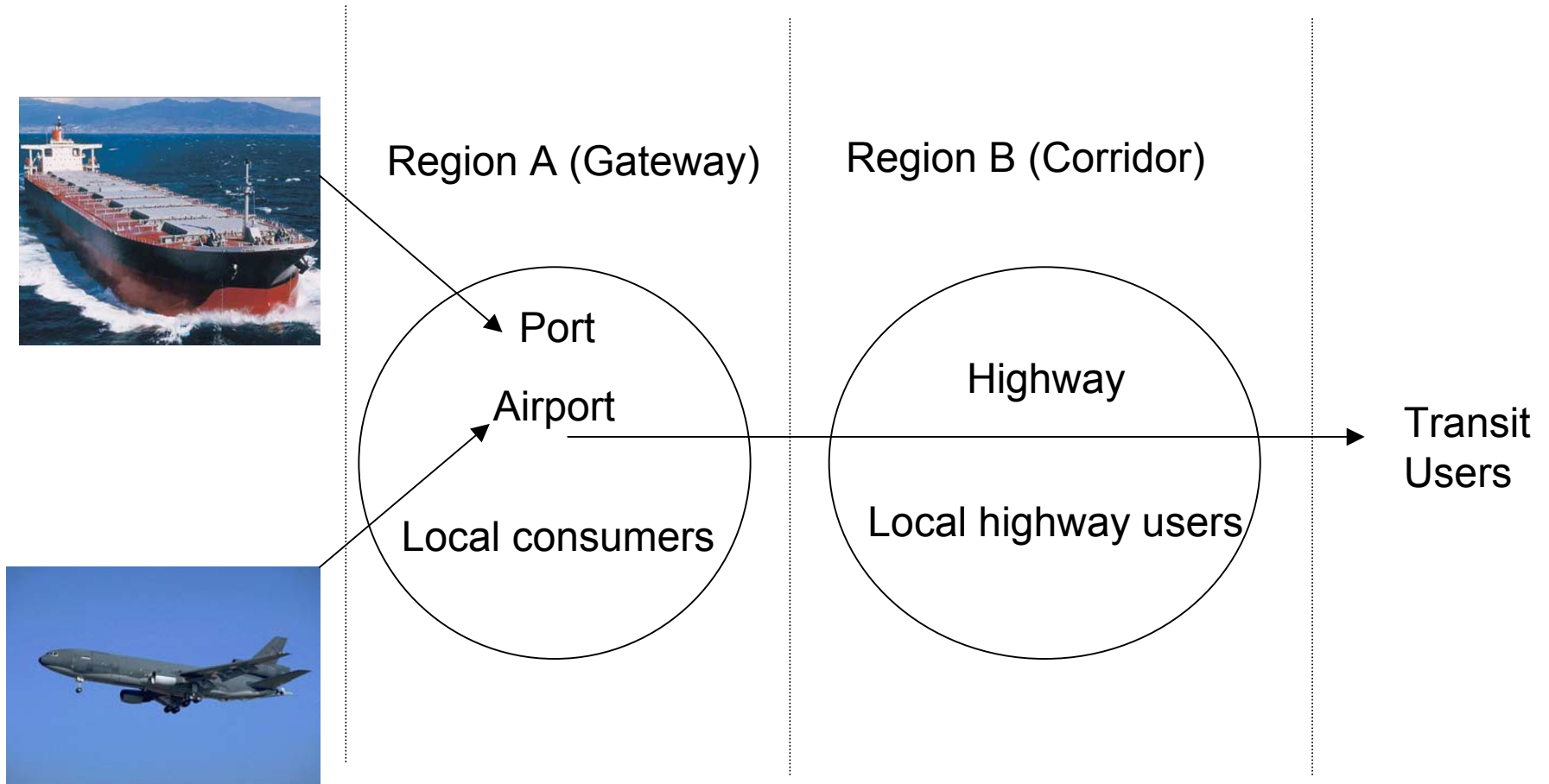


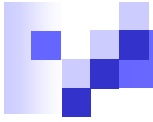


Transport Facility Charges and Capacity Investment in a Congestible Transport System: Gateway, Corridor and Hinterland

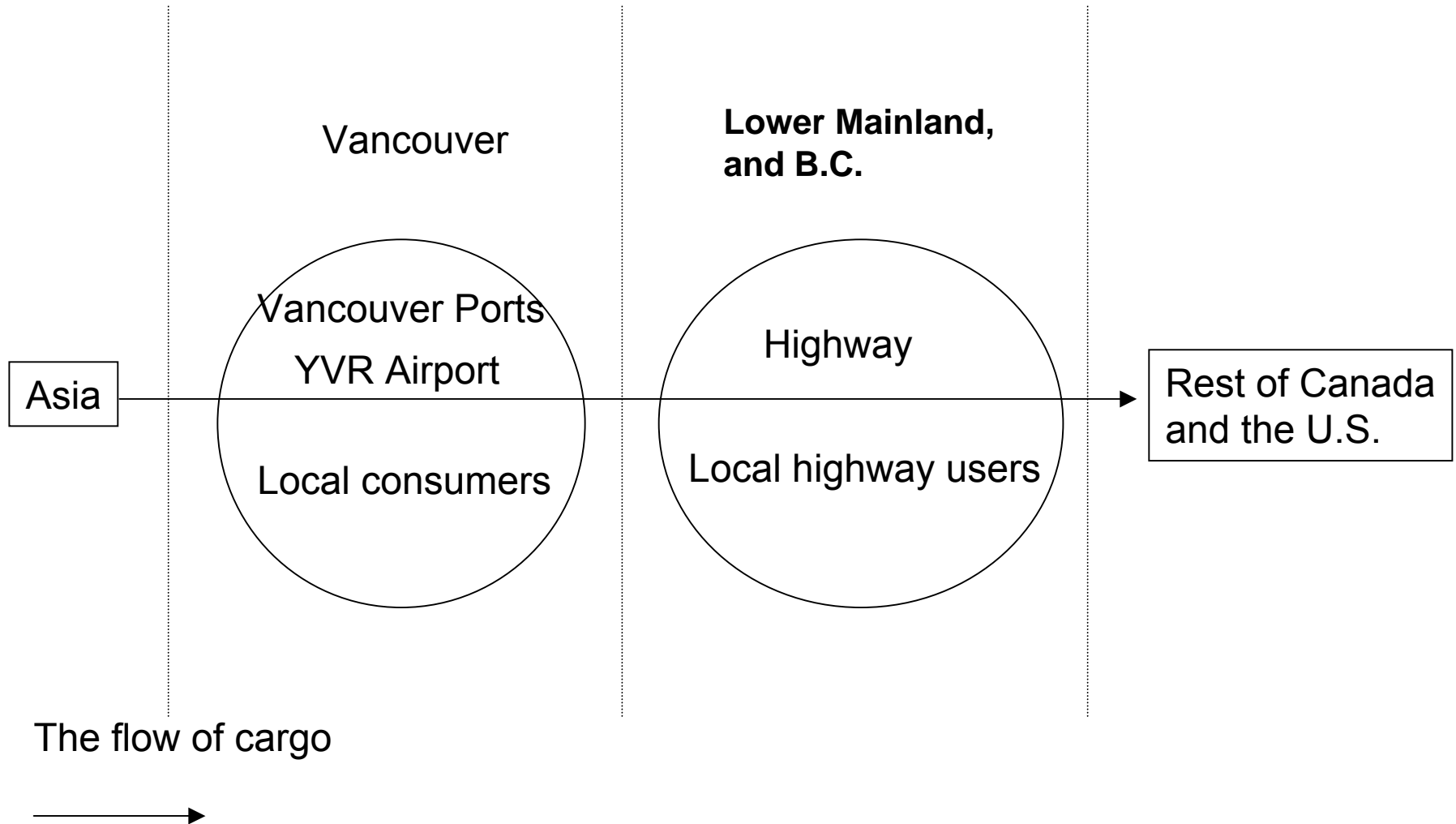
Anming Zhang
Sauder School of Business
University of British Columbia

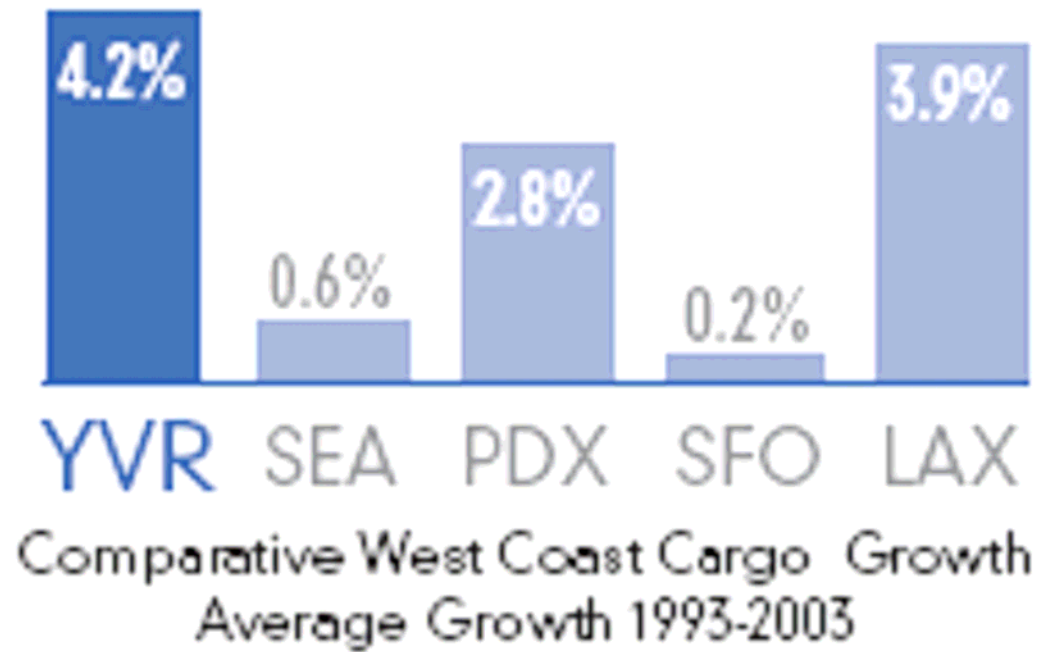
Idea: A gateway-corridor system





A motivating case: Vancouver as a gateway





Source: YVR airport



Industrial background: Port

1. Oligopoly market structure of shipping liners

- In 1980 the top-20 carriers controlled 26% of the world's slot capacity, but this number rose to 58% in 2003 (Notteboom 2004)
- The increase in market concentration is due partly to large consolidations

2. Congestion at ports

- The 12 shipping lines in the U.S. West Coast (accounting for 70% of trans-Pacific trade) estimated that costs in 2005 would rise 10% due to port congestion
- In the EU, port congestion has also raised concerns



- Multi-modal transportation and congestion
 - Port-road/rail arrangement is common at major ports, esp. those serving as gateways (e.g., Vancouver, Hong Kong, Rotterdam)
 - In 2005 Ports of Los Angeles and Long Beach had to divert more than 100 ships to other ports due to congestion at the corridor's roads and rails


- Inter-governmental coordination between the port and corridor regions
 - Transport facilities of a multi-modal system are usually under different jurisdictions (local governments, and the port and road/railway operators)

- Ownership structure of ports
 - Considerable variety in ownership types: public; local government; private



Industrial background: Airport

1. Oligopoly market structure of air carriers
2. Congestion at airports: Now major policy issue in the U.S., Europe, Japan, and China
3. Multi-modal transportation and congestion at corridor
4. Inter-governmental coordination between the airport and corridor regions
5. Ownership structure of airports: privatization is now a major trend around the world



Model structure: 3-stage game between gateway & corridor regions

- 1st → Capacity
 - 2nd → Facility charges
 - 3rd → Shipping liner competition / airline competition
- } under different regimes:
public vs. private ownership



Regions' Interests:

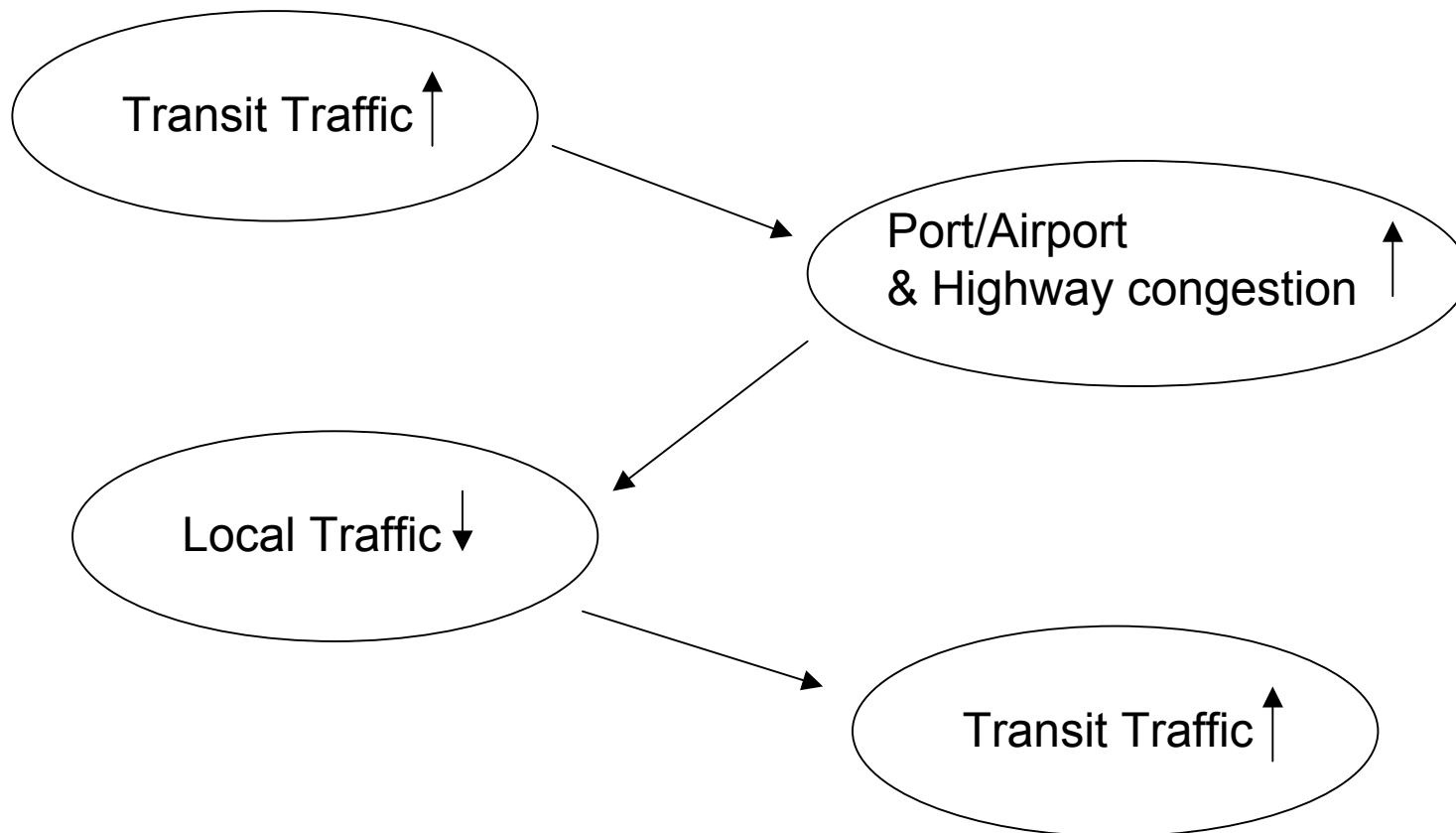
- Gateway region
 - Shipper liners / airlines (maybe a portion of profits)
 - Local port/airport consumers
 - Port / airport profit

- Corridor region
 - Local highway users
 - Highway profit

- Transit users are outside the gateway-corridor system

- Transit traffic is important in the model

- It connects the two regions: so their facility charges & investments are related

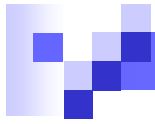




Main messages

- With independent governments, congestion cost are internalized, but still inefficient:
 - Exporting congestion externalities to other region
 - Gateway region coordinates, via its pricing, its carriers' decision to induce collusive outcome

- With collaboration between two governments
 - The inefficiency due to congestion externality exporting is resolved
 - But 2nd problem is only partially resolved, since transit users are outside the two-region system



A privatized port/airport

- It concerns about only its own profit
- Consumers' interest and, for gateway region, carriers' profit are ignored
 - 'Double-marginalization' problem arises
 - But, the incentive of raising the gateway charges to induce carriers' collusion is reduced
 - Overall, port/airport charges rise.



■ Capacity decision

- Full cooperation
- Local welfare-maximizing case
 - Under-investment?

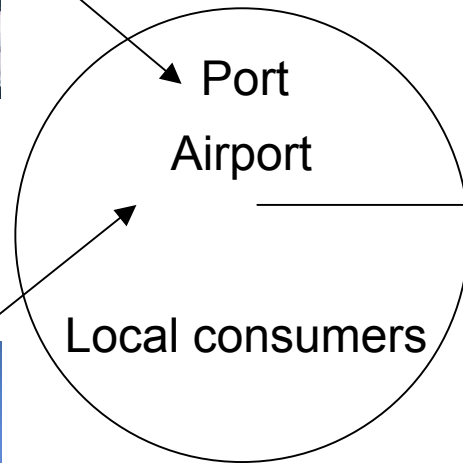
- Unconditional grant for capacity investment
- Partial cooperation
 - Two regions make one decision (capacity, or pricing) jointly, but they make the other decision independently.



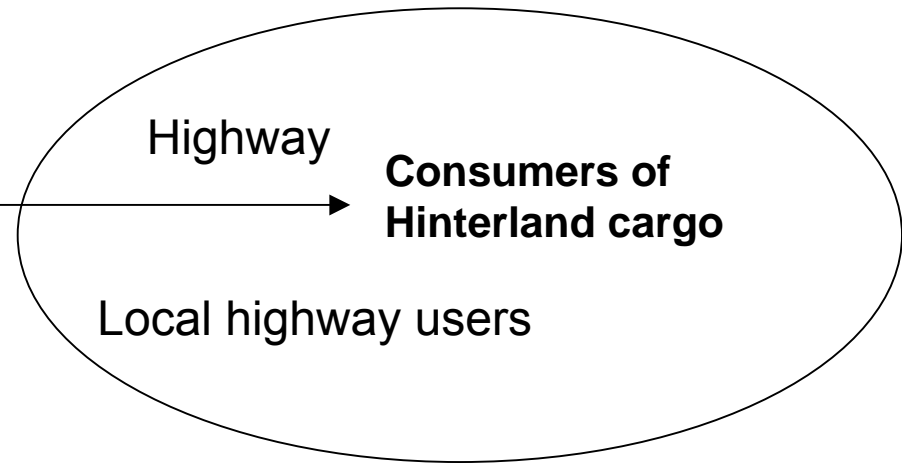
Gateway-Hinterland Case



Region A (Gateway)

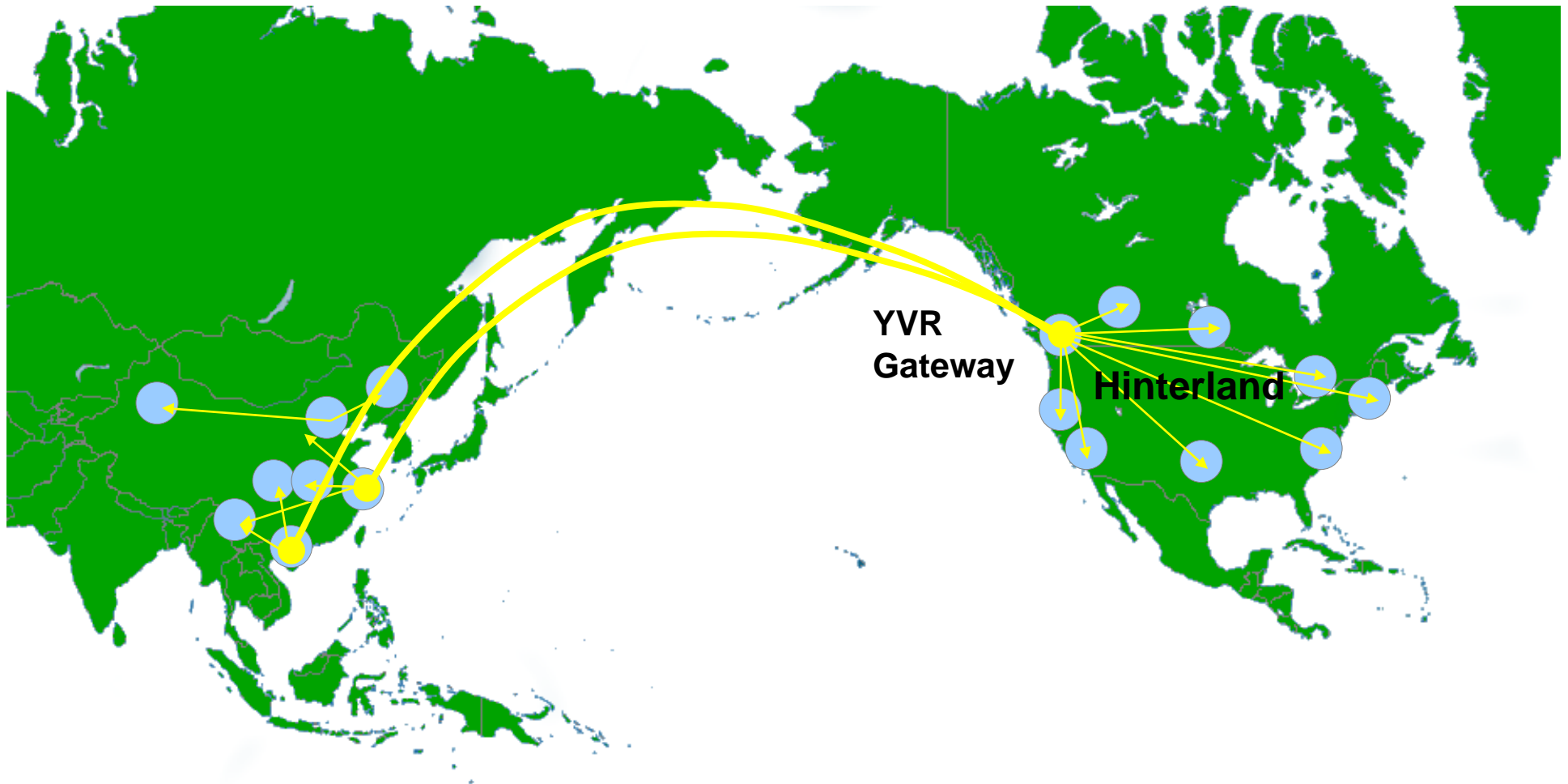


Region B (Hinterland)



A motivating case:

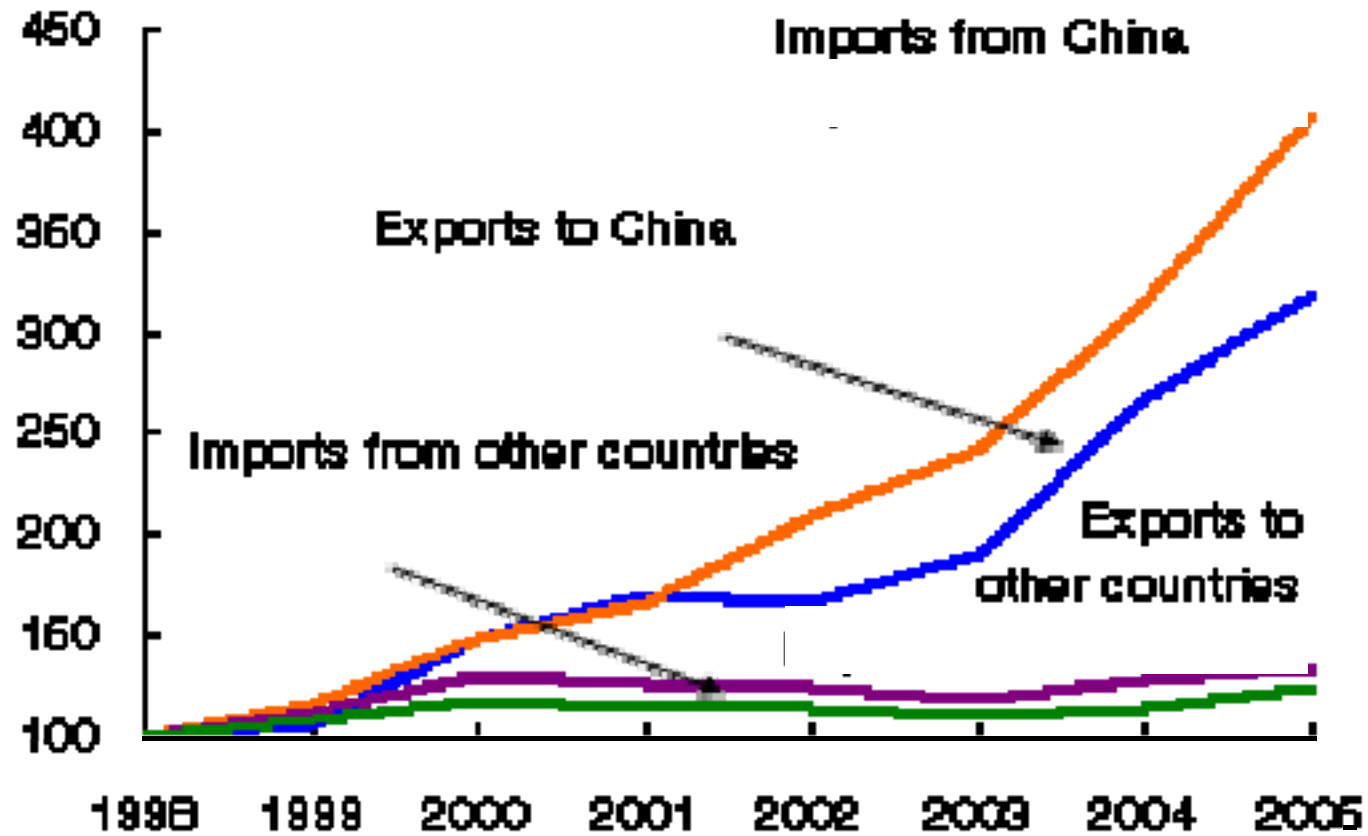
- Vancouver acts as a gateway to its North America hinterland





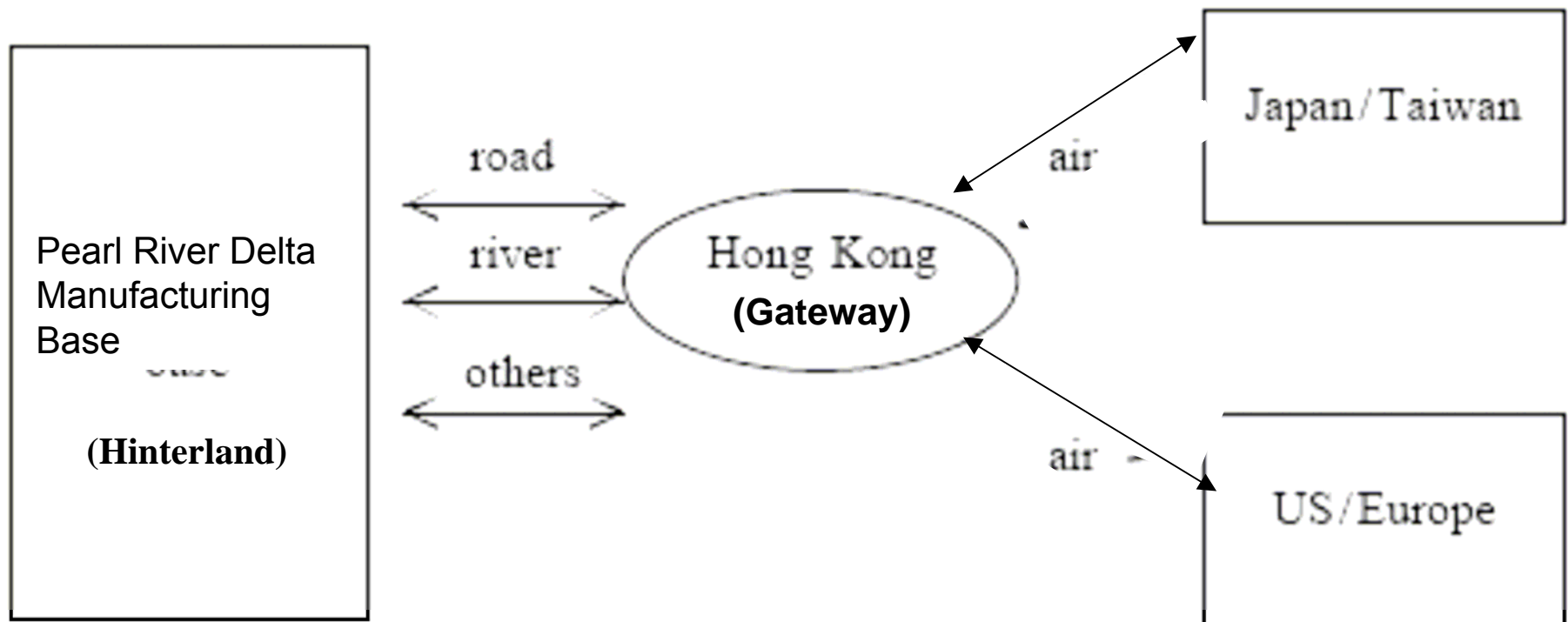
Merchandise Trade

Index 1998=100



Source: Statistics Canada

Also...





Observation:

- Similar analysis is conducted for the gateway-hinterland case
- Different from the gateway-corridor case, the hinterland case usually involves two countries
- As a consequence, international trade policy may play an important role. Furthermore, it opens up the interesting issues of trade-transport policy interactions – a domestic policy such as facility charges and investment may impact the trade policy and cross-border welfare.



Final comment:

- To summarize, we attempt to construct models to conceptualize ‘gateways’, ‘corridors’, and ‘hinterlands’
- Industry backgrounds – e.g., oligopoly market structure at the carrier level, multi-modal transportation & congestion, and independent jurisdictions – are incorporated in the analysis
- Further, transport facilities – e.g., ports, airports, roads, rails – may be public-owned, private-owned, or a mix of the two
- Finally, different jurisdictions/governments may engage in independent decision-making (non-cooperation), partial cooperation, or full cooperation.

Thank You