



***Impacts on Cargo Transport by the
Construction of Inter-regional
Highways and Railway between the
two of Japan's Main Islands,
Honshu and Shikoku***

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- (1) Features of Shikoku
- (2) Outline of Inter-regional Transport
- (3) Impacts on Cargo Transport
- (4) Impacts on Socio-economy
- (5) Problems
- (6) Proposal
- (7) Conclusions

The smallest island among Japan's four main islands

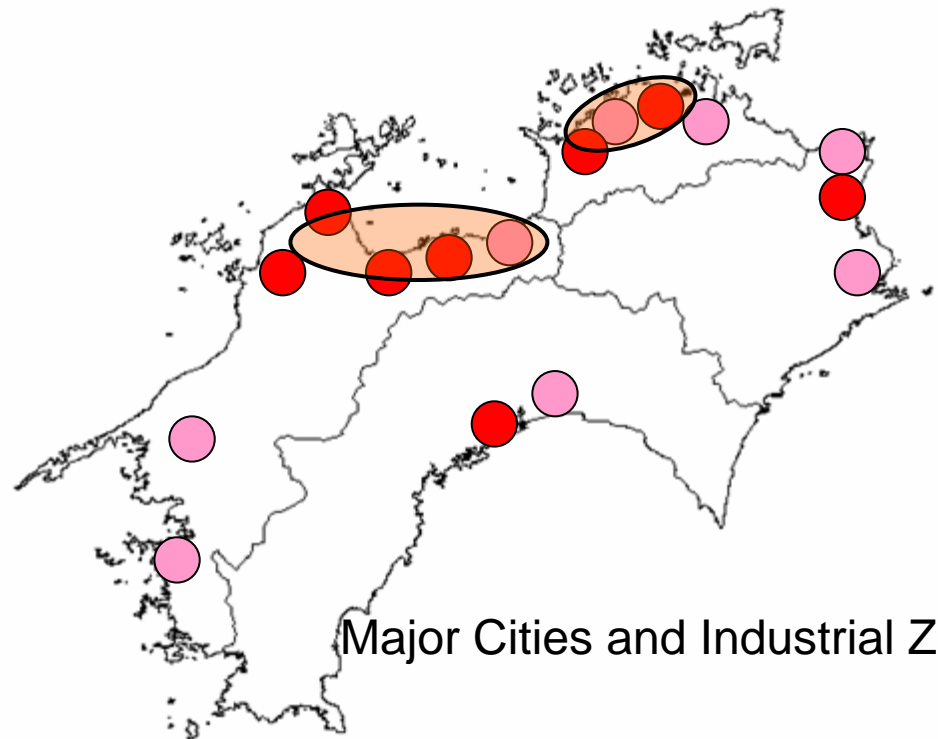
5% of the national land

Mainly underpopulated mountainous region

3.2 % of Japan's population (\approx New Zealand) and 2.7 % of GDP

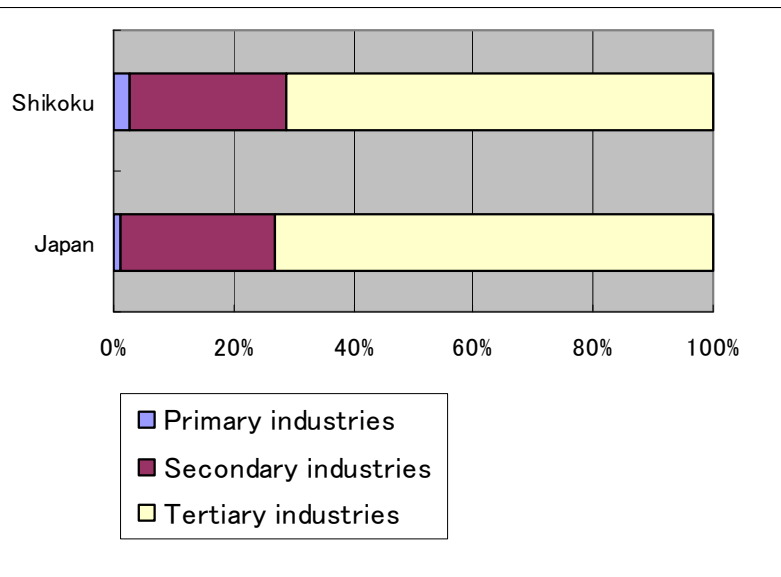
Successful shipbuilding industry (10% share of the world)

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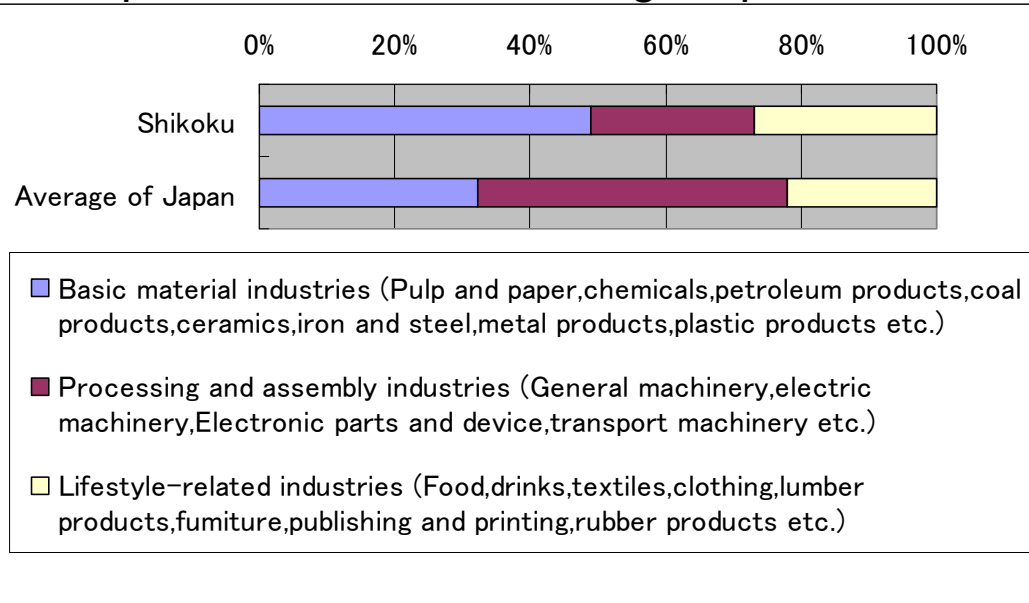


Major Cities and Industrial Zones

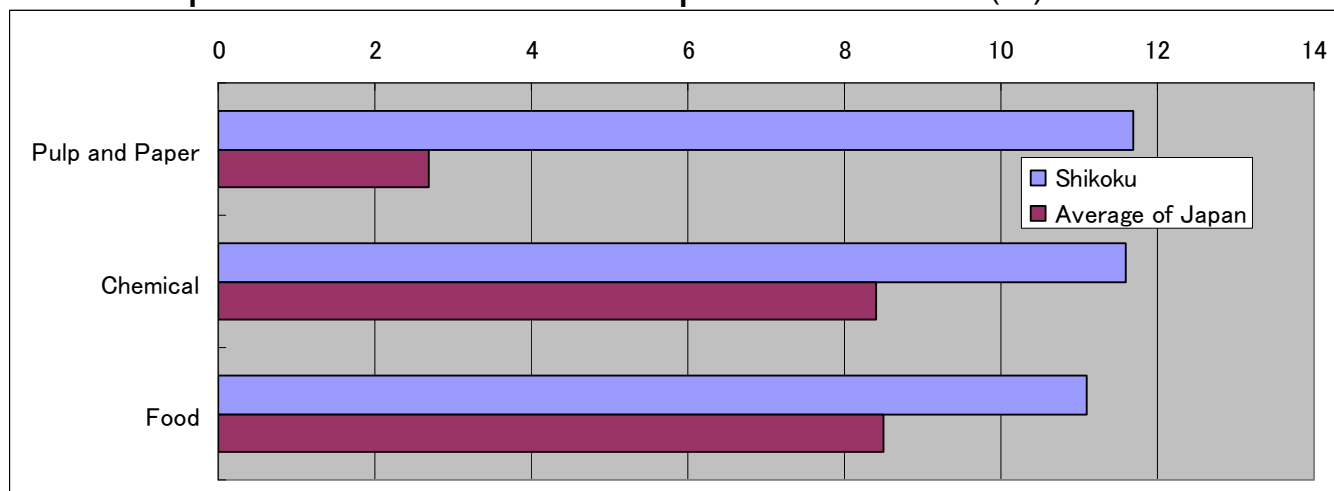
Industrial Structure



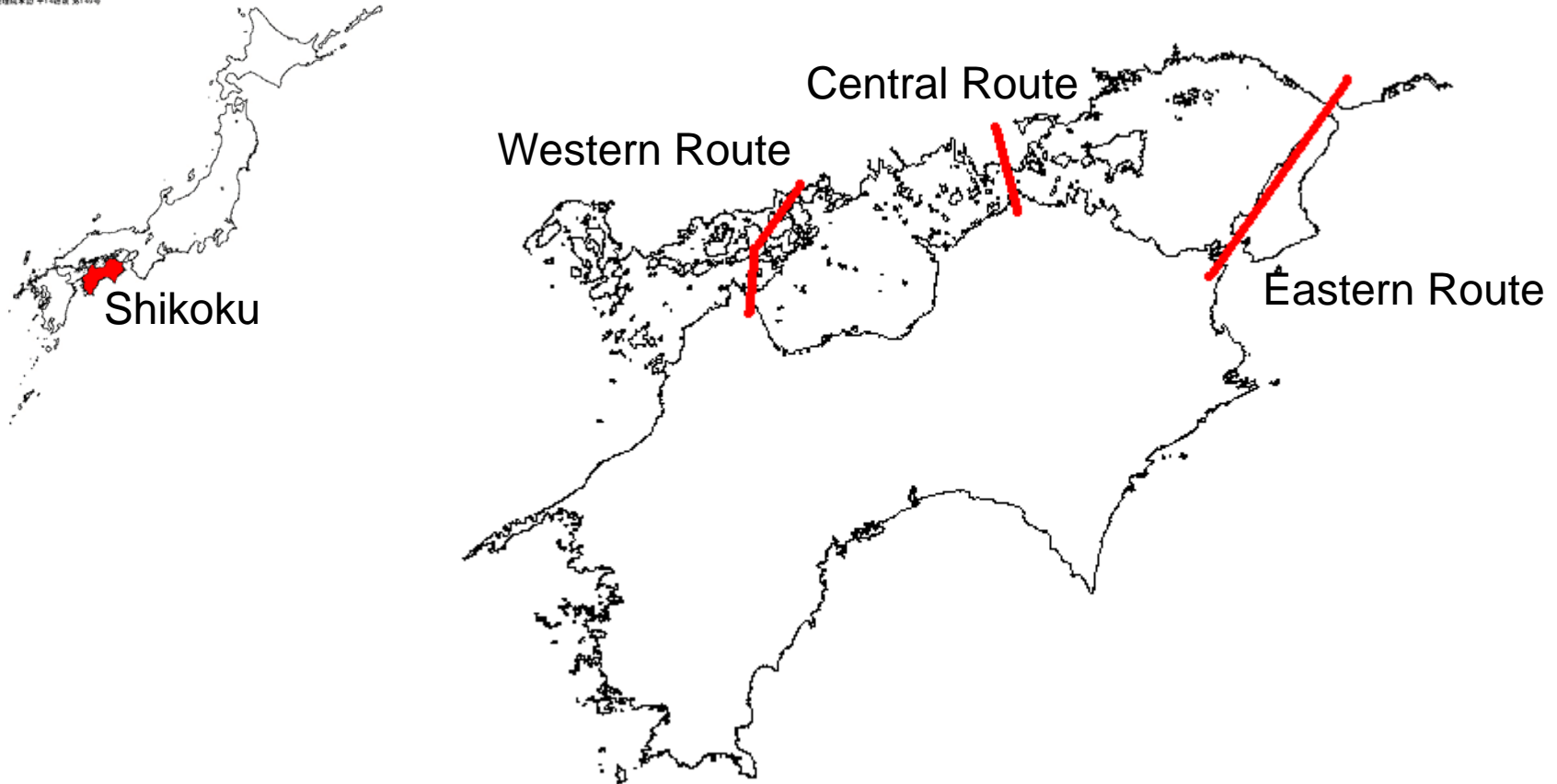
Composition of Manufacturing Shipment Value



Proportion of Industrial Shipment Value (%)

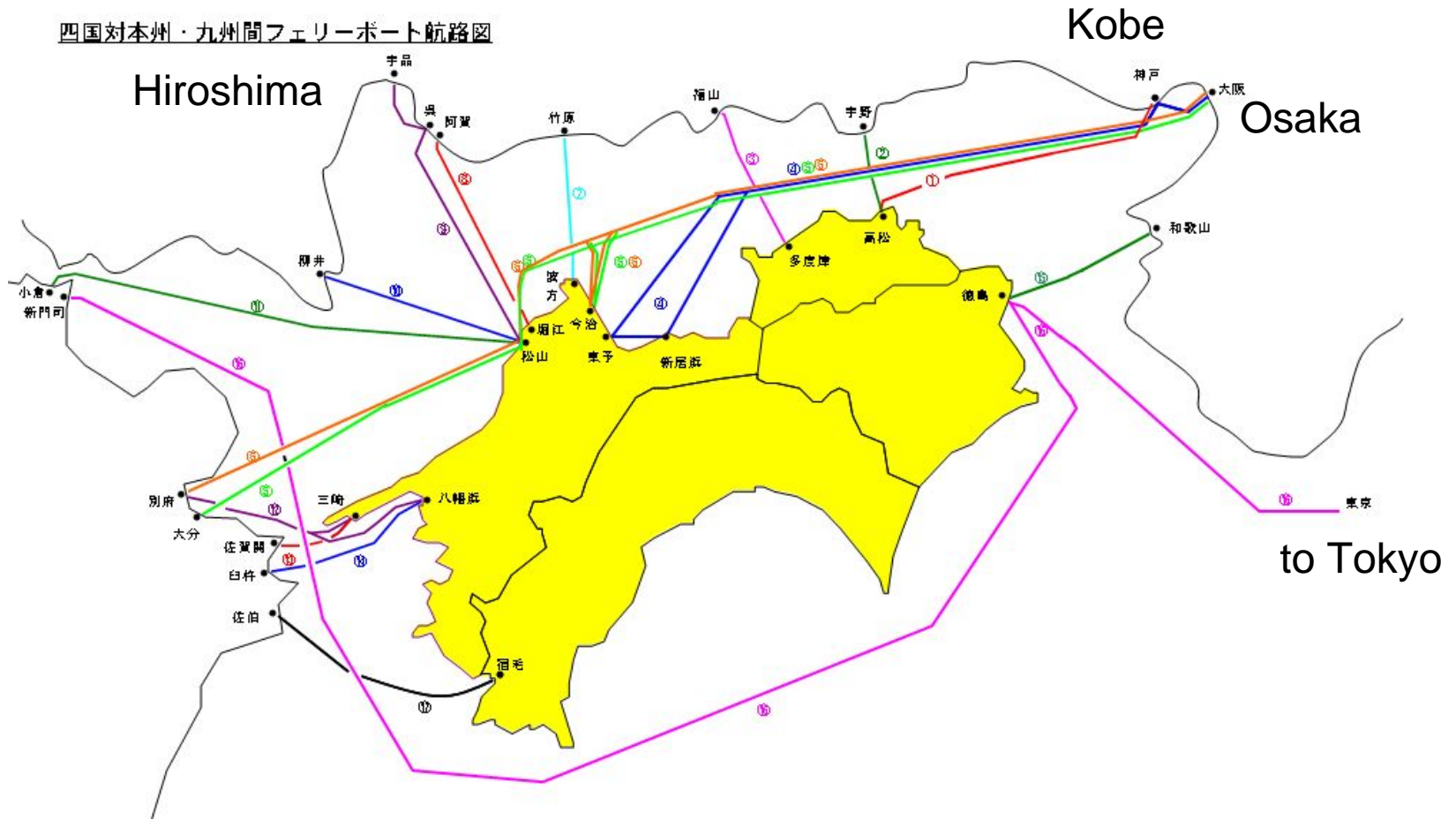


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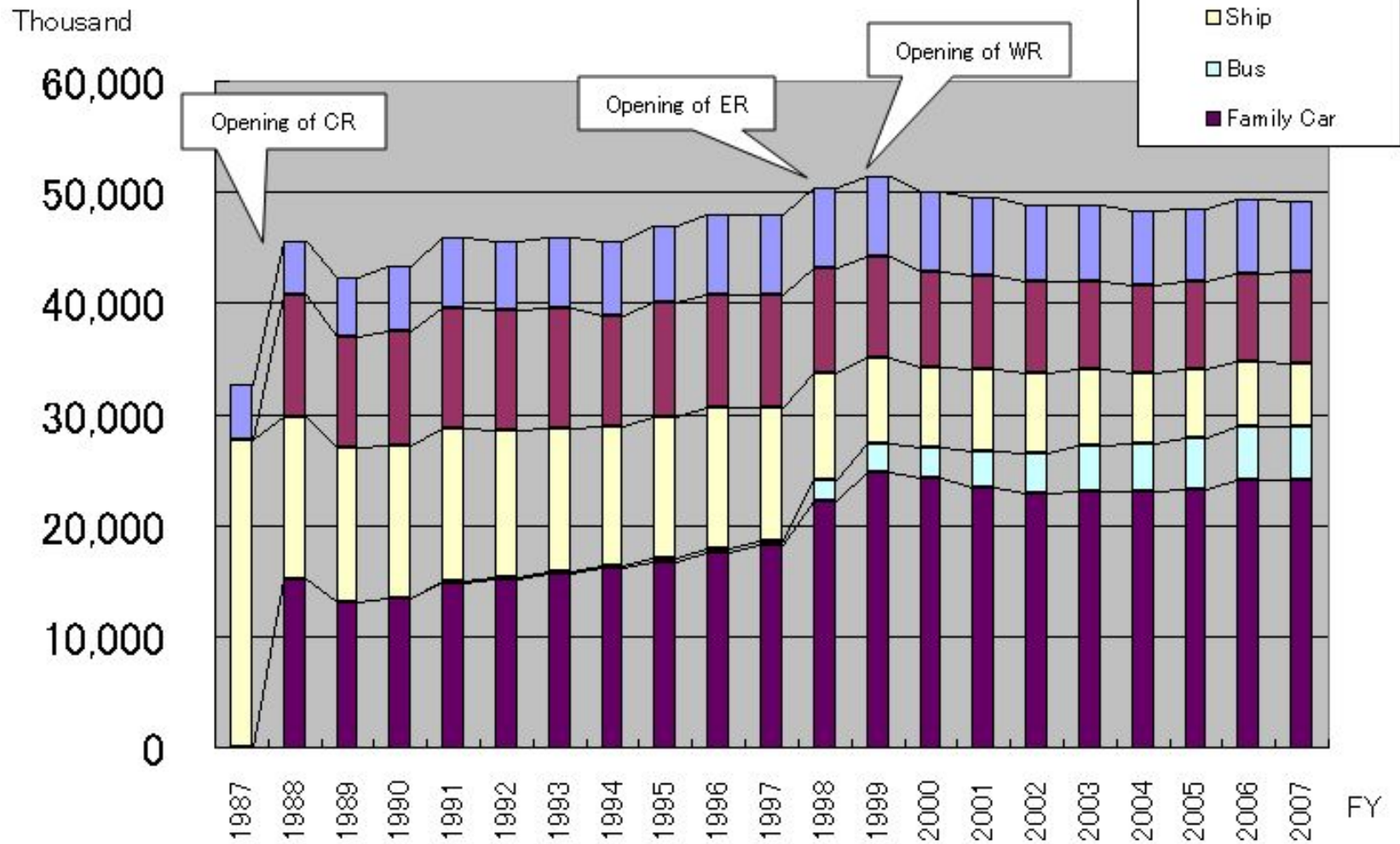


Western Route	Central Route	Eastern Route
Road	Road and Rail	Road
47 km	39 km	89 km
Opened in 1999	Opened in 1988	Opened in 1998
5,000 cars/day (2007)	14,000 cars/day (2007)	19,000 cars/day (2007)

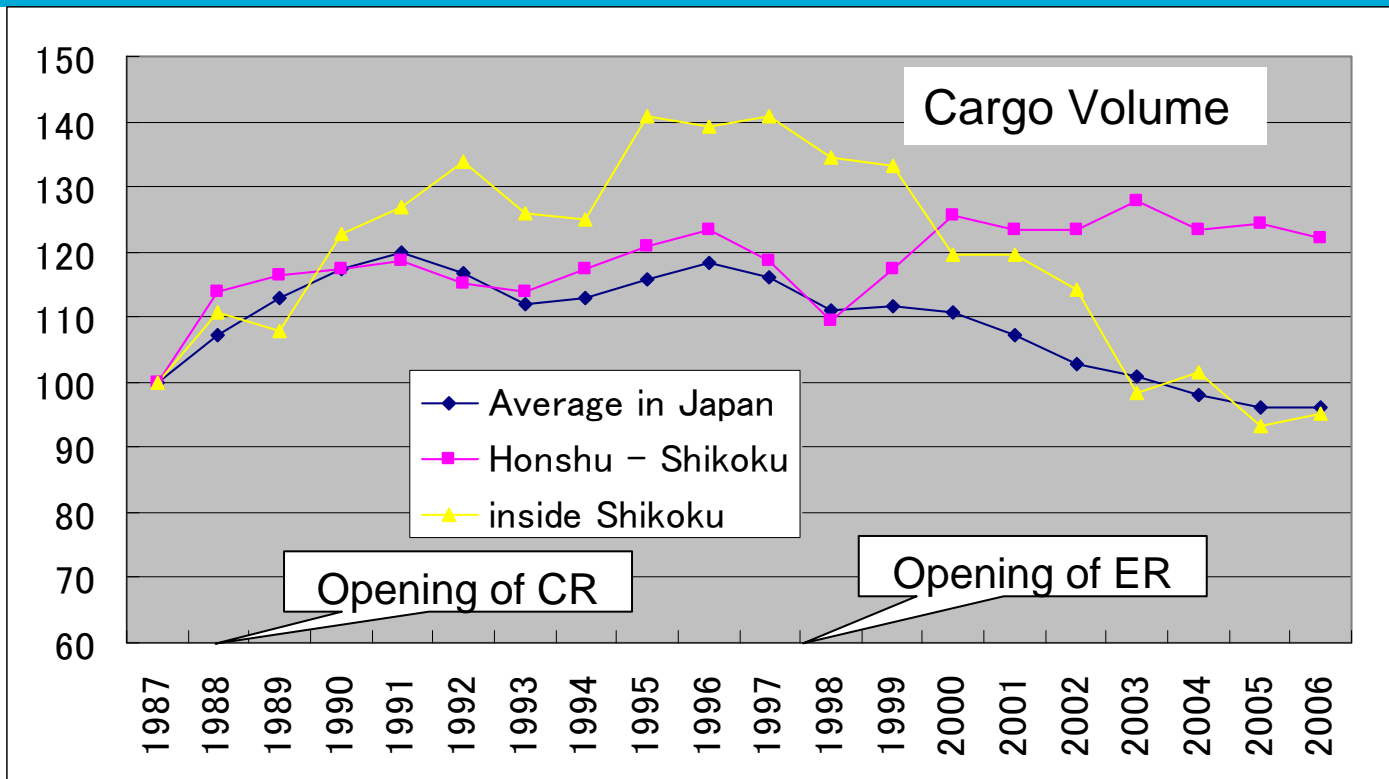
Ro-Pax Ferry Network



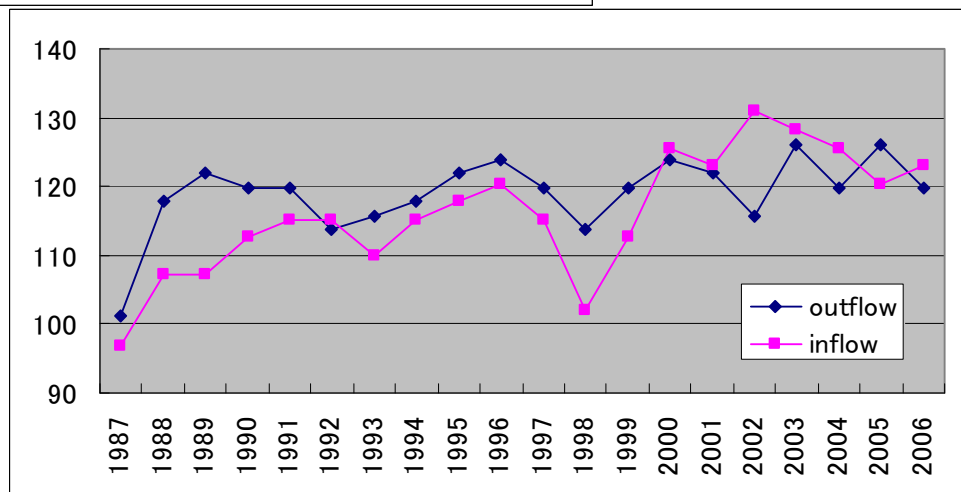
Passenger Transport between Shikoku and Honshu



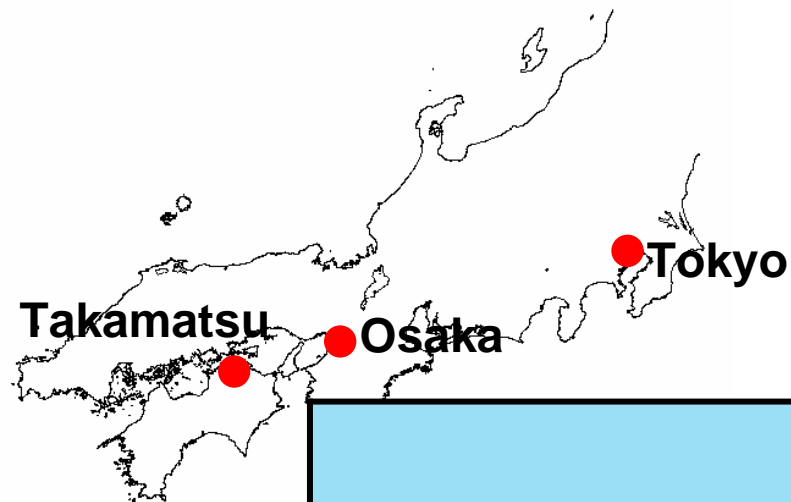
Impacts on Cargo Transport (1)





Index : Volume in FY1987=100



Index : Average from 1983 to 1987=100



Time Required for Cargo Transport

	1985	Ave. (2000 and 2005)	
Takamatsu  Osaka	15.8 hrs	15.0 hrs	- 5.1 %
Takamatsu  Tokyo	26.4 hrs	22.2 hrs	- 15.9 %

Modal Share of Freight Railway

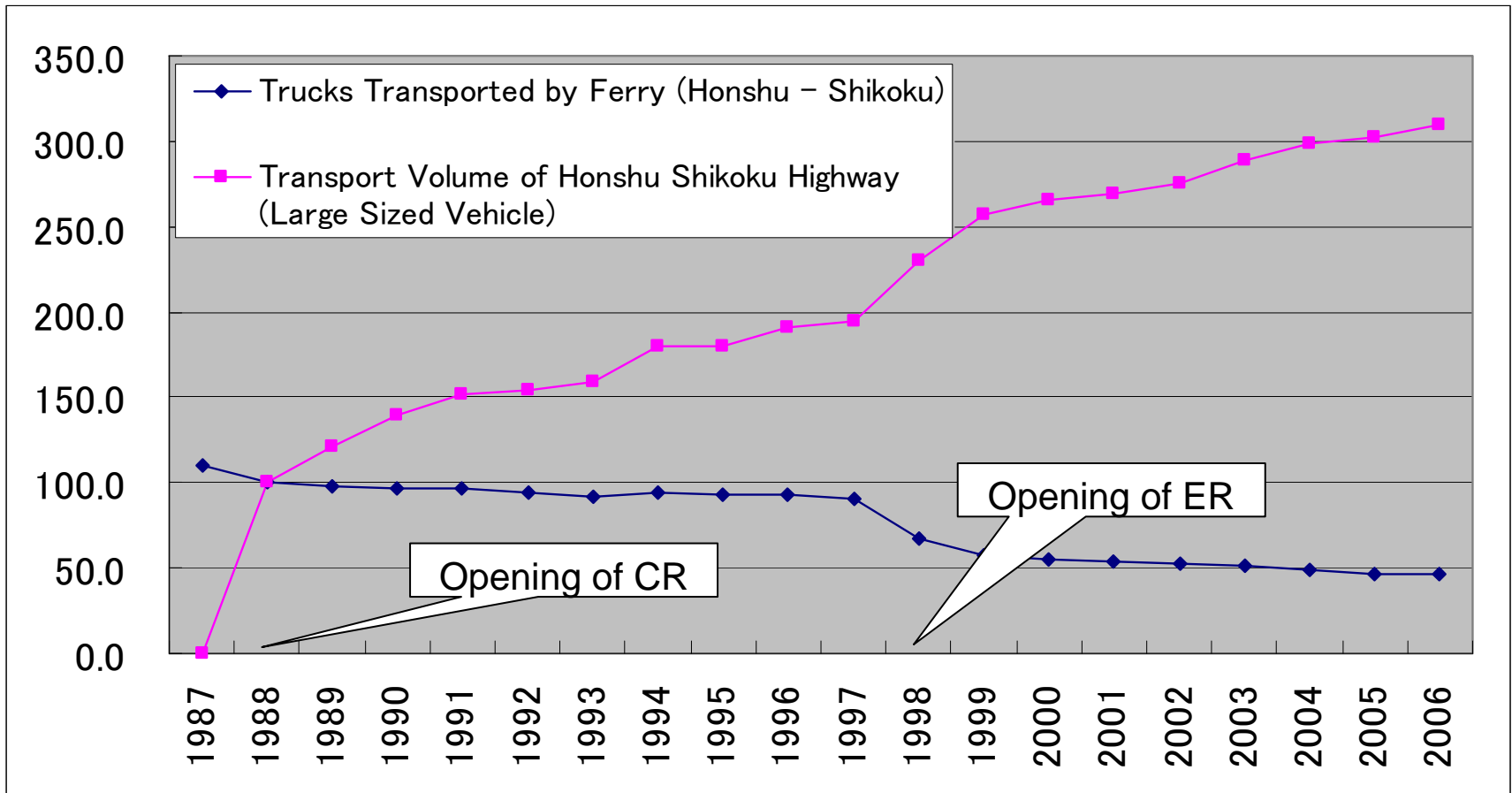
	1985	1995	2005
Shikoku - Honshu	0.84% *	0.85%	0.81%
Average in Japan	1.21%	0.77%	0.66%

* : Train Ferry

Opening of Rail Bridge

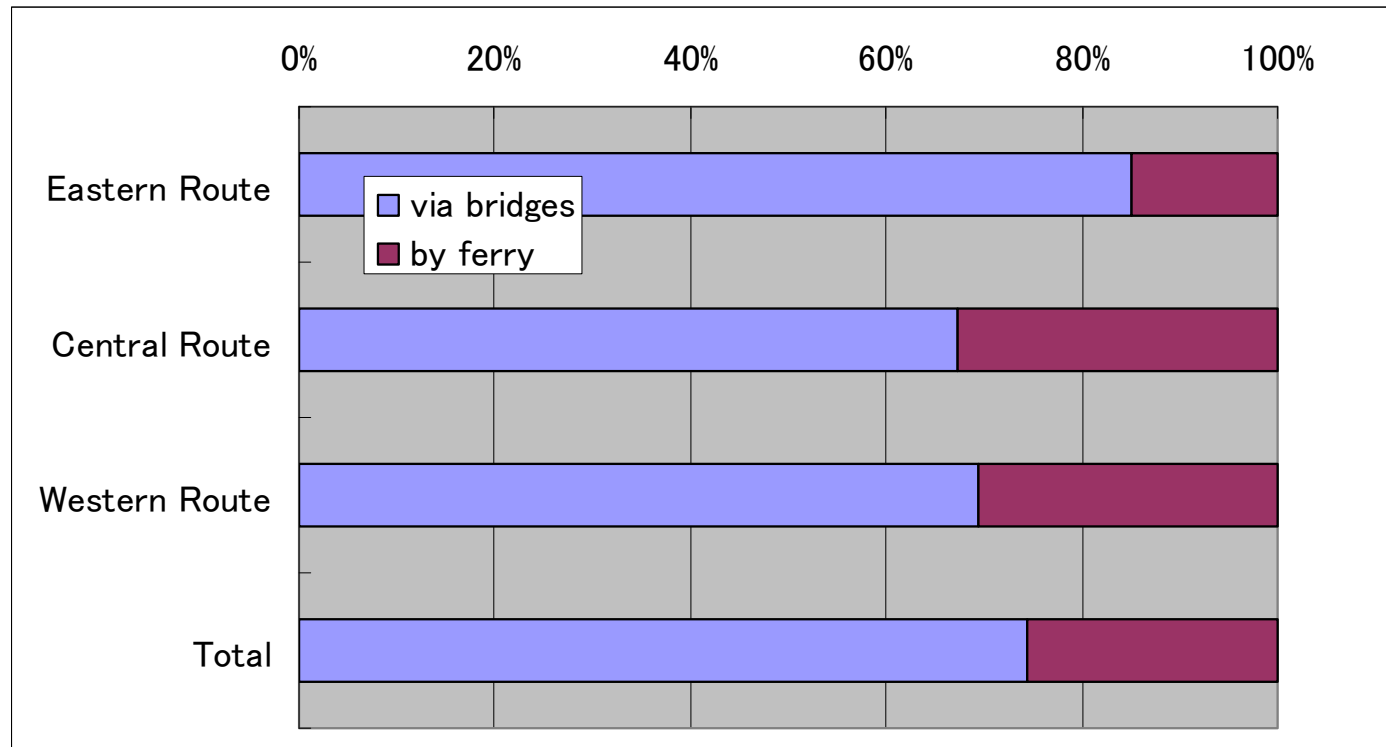
- cf.
- The number of passenger of Honshu-Shikoku rail increased 2.6 times as compared with that of train ferry.
 - Modal share of rail for all cargo in Shikoku is 0.31%.

Comparison of Highway and Ferry Cargo



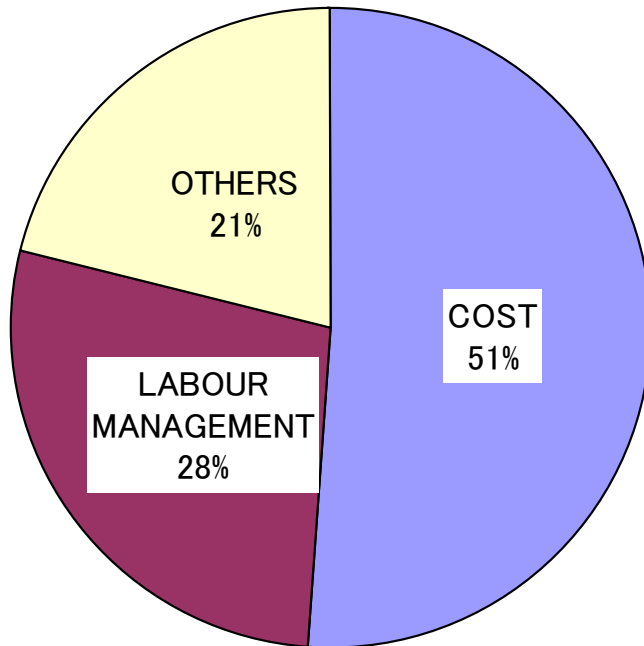
Index : Numbers in FY1988=100

Choice of transport routes by trucks between Shikoku and Honshu



ref. Japan Trucking Association, 2007

Reasons of NOT Using the Inter-regional Highways for Cargo Transport



Shikoku Economic Federation,
2002

Comparison of Toll Rate for Large-sized Vehicle

Honshu-Shikoku Highway

$$\begin{aligned} \text{Toll} &= 48.6 \times \text{distance(land)} \\ &\quad + 437.8 \times \text{distance(bridge)} \\ &\quad + 155.9 \text{ (Yen)} \end{aligned}$$

West Japan Express Way

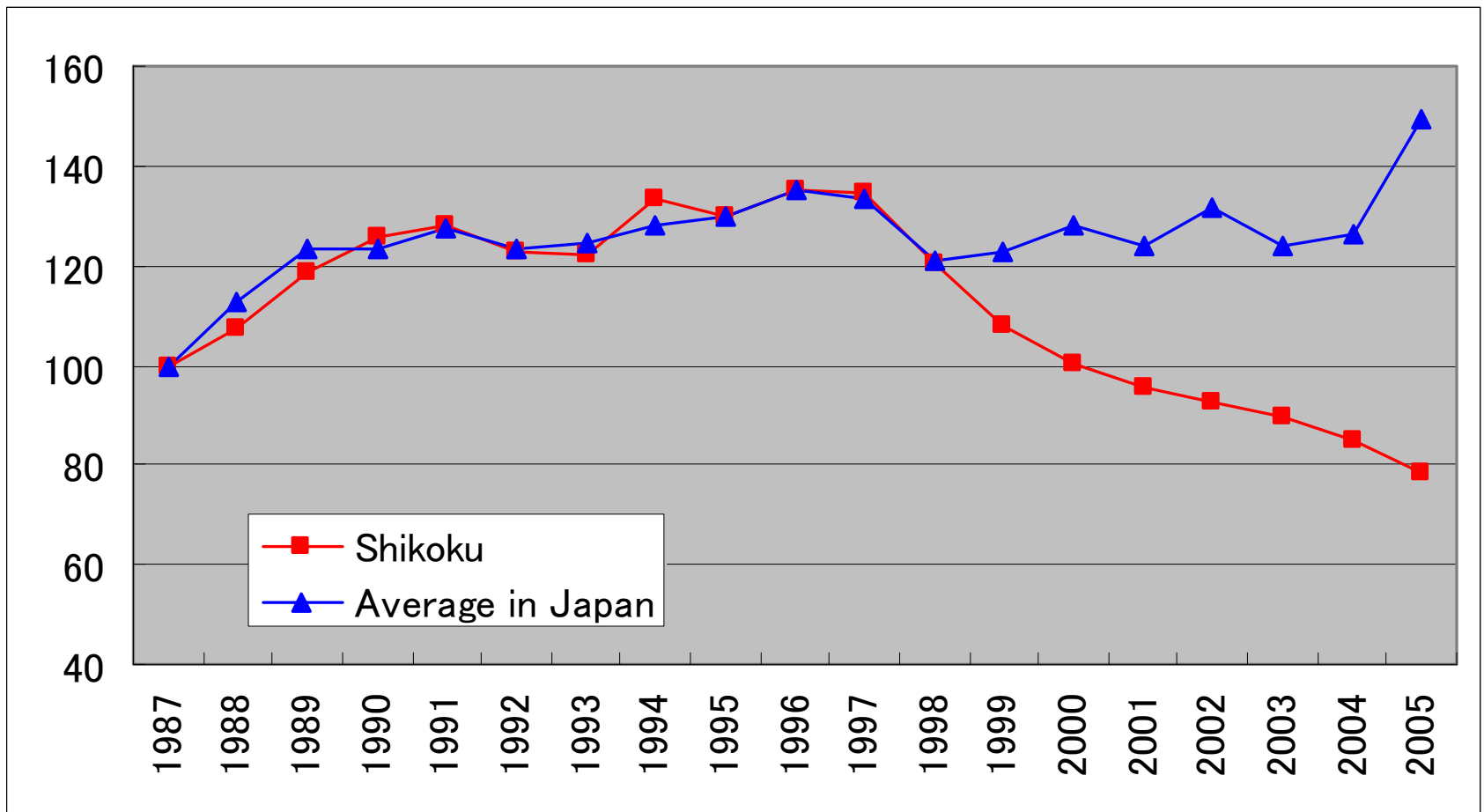
$$\text{Toll} = 42.6 \times \text{distance} + 259.9 \text{ (Yen)}$$

Ex.

10km (land) + 10km (bridge) via HSH → 5000 Yen

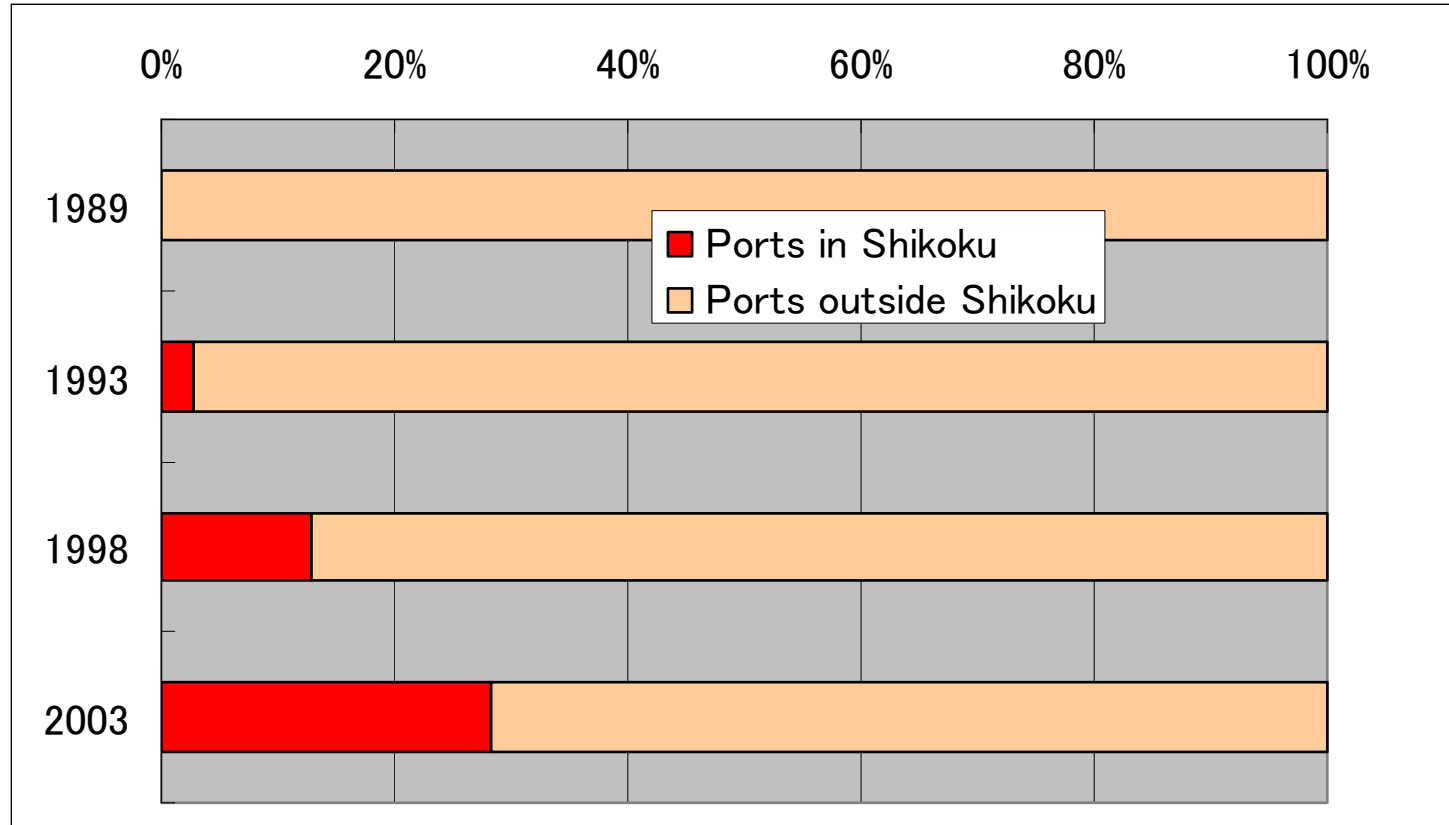
20km via WJEW → 1100 Yen

Handling Volume of Warehouses



Index : Throughput in FY1987=100

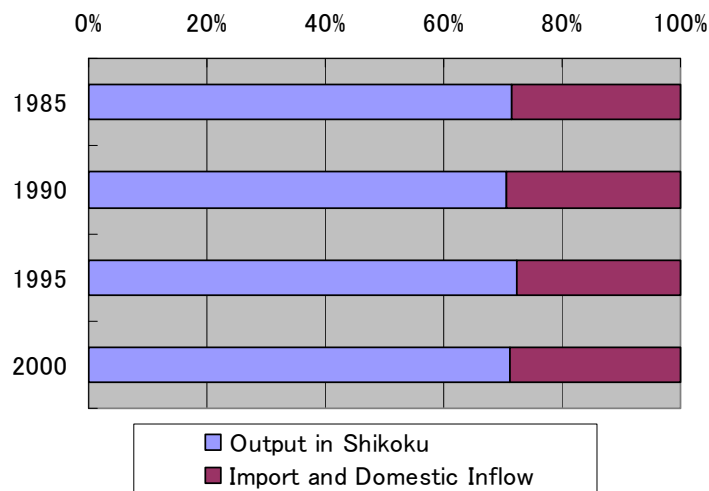
Loading/discharging Ports of International Container Cargo to/from Shikoku



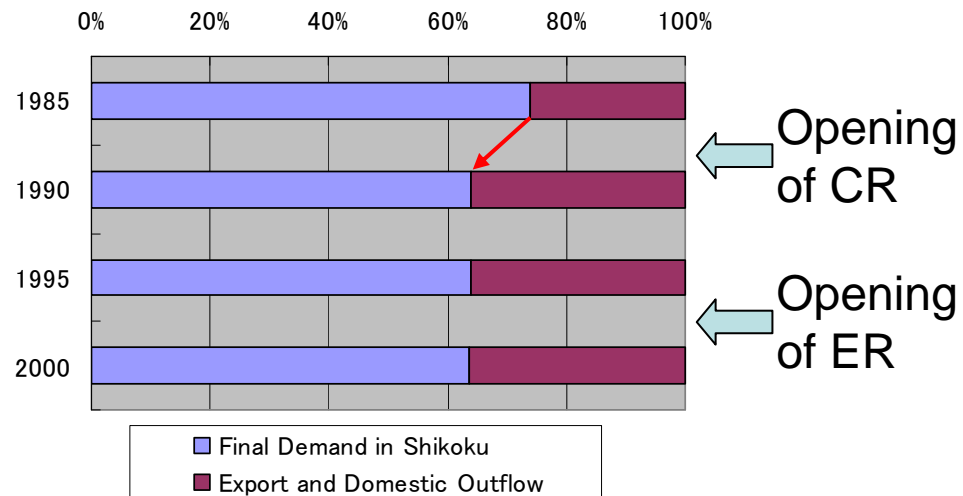
ref. International Container Cargo Flow Survey, MLIT

		1987	2005
Shikoku's share in Japan	Population	3.5 %	3.2 %
	Value of manufactured goods shipment	2.4 %	2.7 %
Ratio of income per capita in Shikoku to national average		0.801	0.808

Breakdown of Total Supply

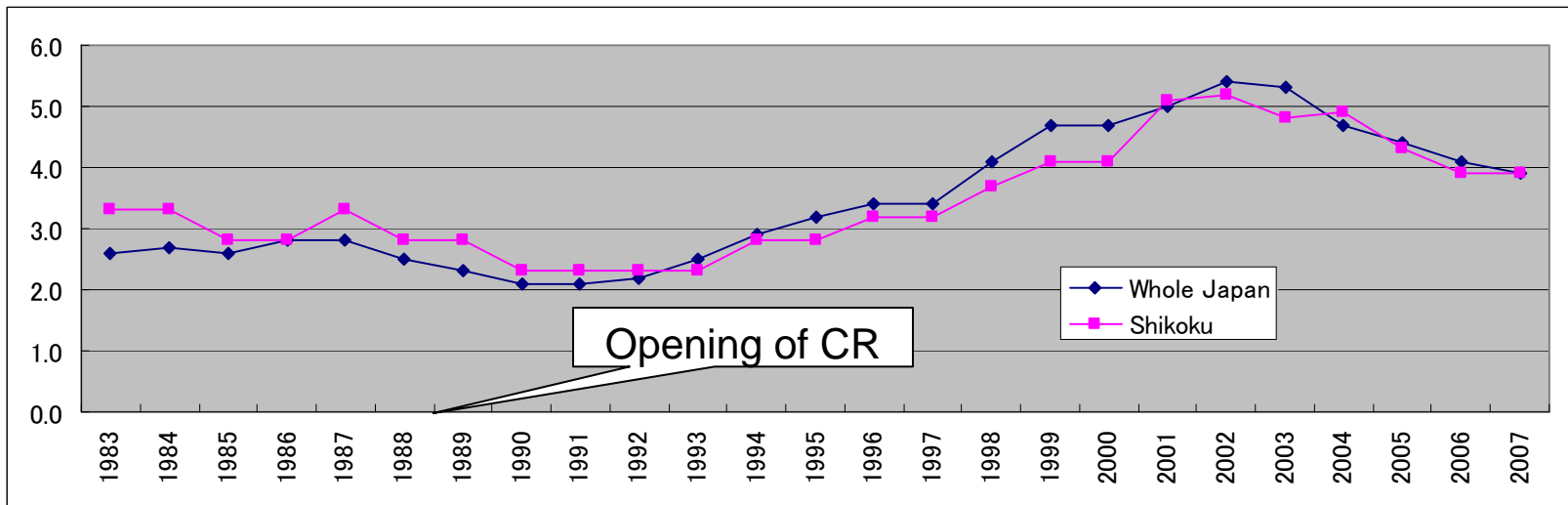


Breakdown of Final Demand

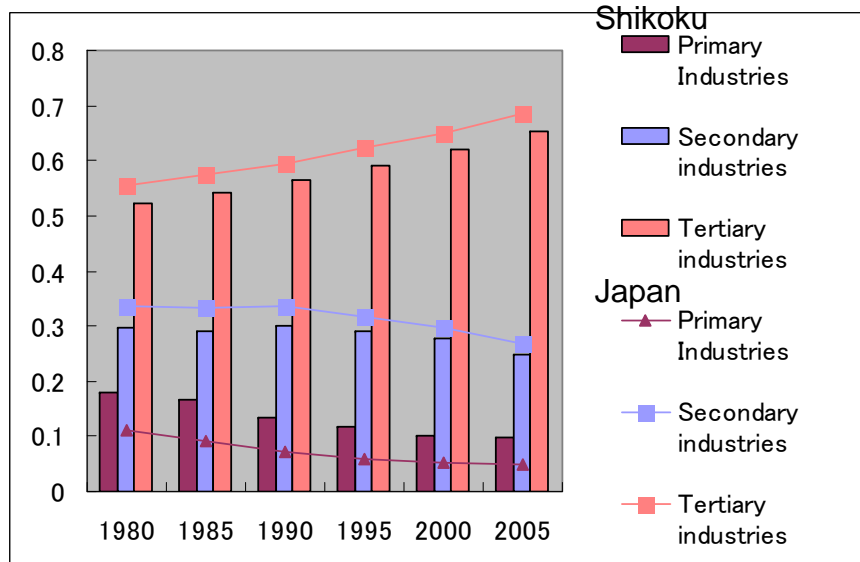


Ref. Shikoku Regional Input-output Table

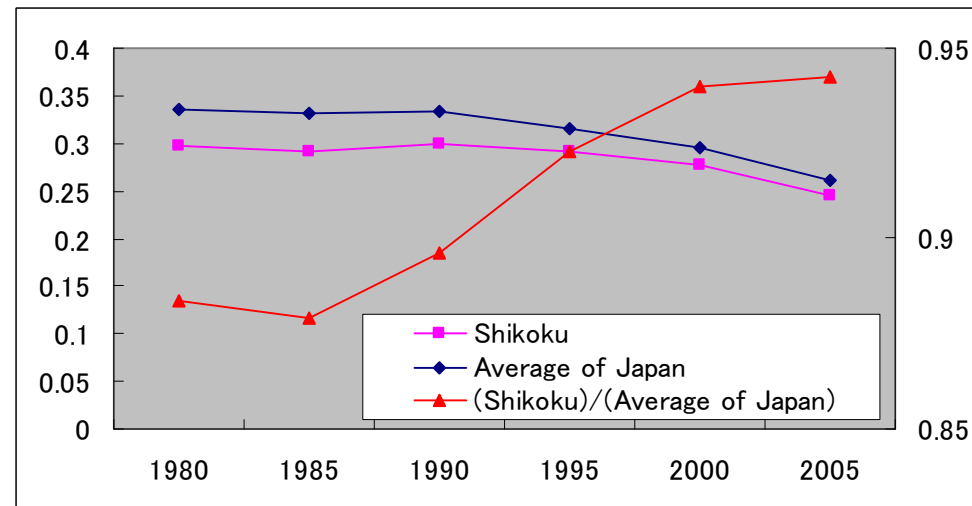
Unemployment Rate (%)

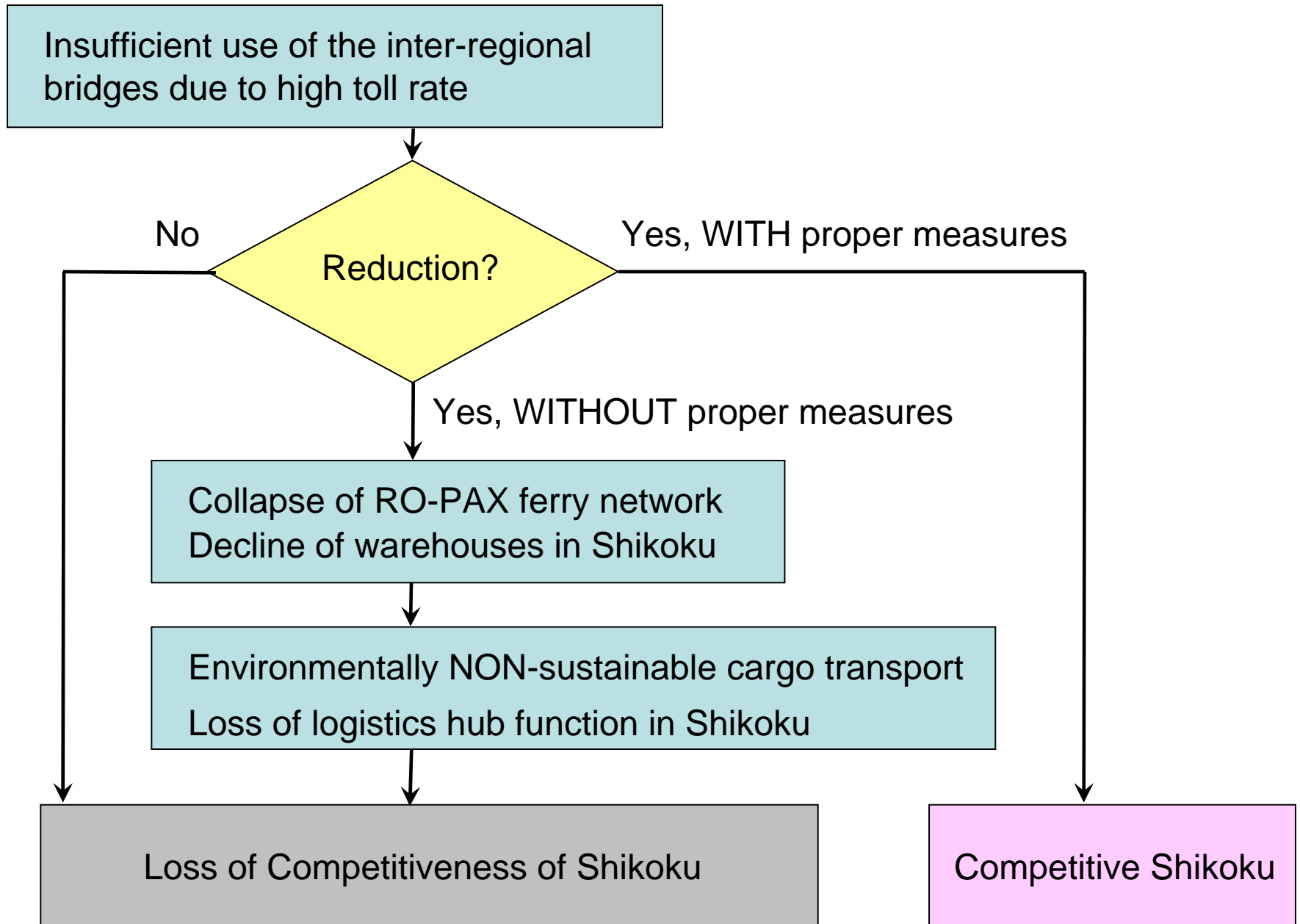


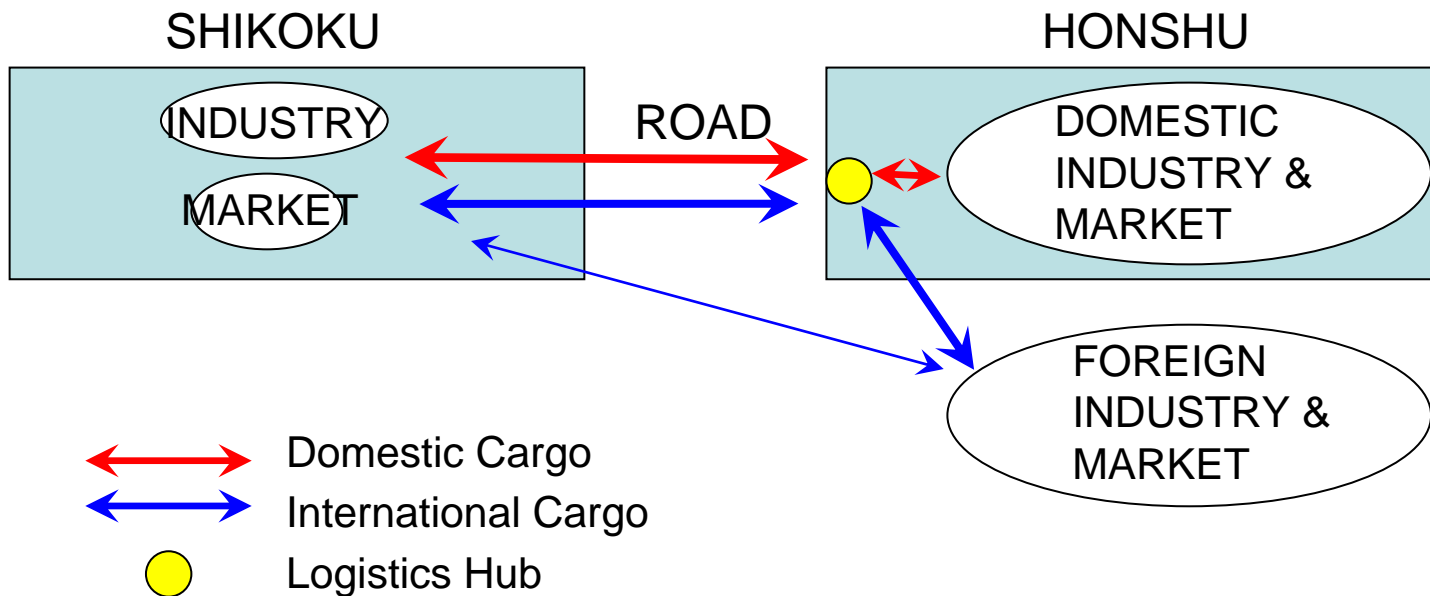
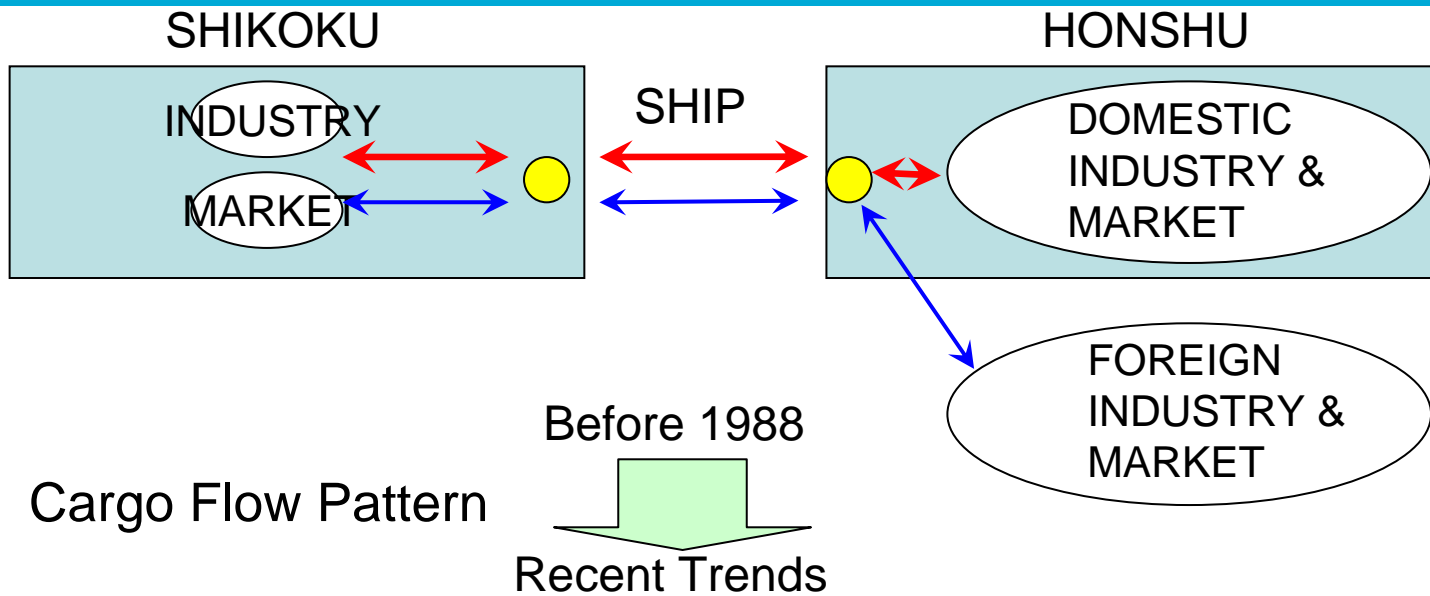
Share of Work Force by Industries



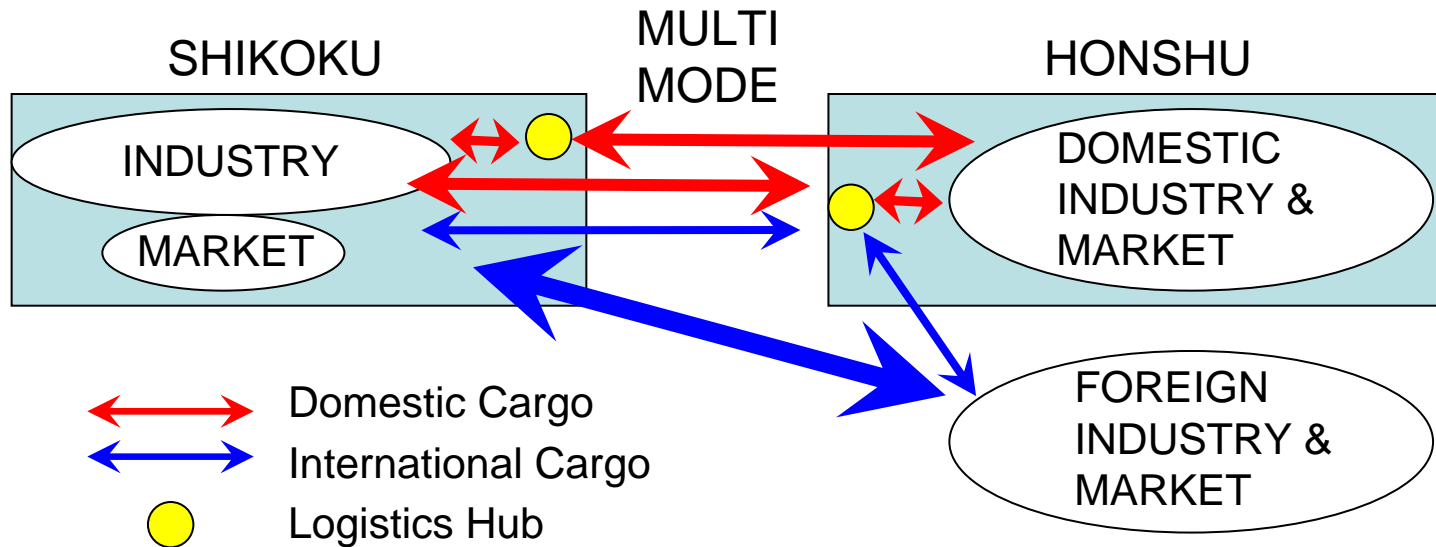
Share of Work Force for Secondary Industries







The future cargo flow should be;



Keywords;

Direct Access to East Asian Market and Industry

Revitalization of Logistics Hub Function in Shikoku

Environmentally Sustainable Multimodal Cargo Transport

Impact on cargo transport by the direct connection of Shikoku to Honshu are;

Cargo volume between Shikoku and Honshu has increased by 20 percent, though the growth rate is smaller than that of passenger transport (50 percent).

Time required for cargo transport between Shikoku and Honshu has been shortened.

More than 70 percent of trucks from/to Shikoku use the inter-regional highways. Thus the highways became main cargo transport routes.

Share of freight rail did not increase and it is still very small.

Impact on cargo transport by the direct connection of Shikoku to Honshu are; (cont.)

The cargo volume transported by RO-PAX ferries has decreased to less than half. The ferry network faces crisis of collapse.

The cargo volume handled in warehouses in Shikoku has decreased while total cargo volume handled in warehouses in Japan has increased.

Although the direct connection to Honshu improved the access to main international ports in Honshu from Shikoku, the ratio of international cargo handled in Shikoku's local ports is increasing.

Some positive impacts on socio-economy are observed such as;

- Growth of manufacturing.

- Extension of Shikoku's market share in Honshu.

- Decrease of unemployment rate.

However, Shikoku's economic performance is still much lower than national average.

In order to fully enjoy the fruits of the great inter-regional connection, its utilization should be greatly increased.

Reduction of toll rate is important to increase traffic of bridges, however, if it is done without proper measures,

It will damage RO-PAX ferry network and logistics industry in Shikoku.

It can make it difficult to realize environmentally sustainable transport.

It can spoil Shikoku's logistics hub function.

Comprehensive approach for industrial development is the most important. In the field of cargo transport, **direct access to Asian market and industry**, **efficient logistics hub function** and **sustainable multimodal transport system** are crucial condition for this target.