



THE AUSTRALIAN NATIONAL UNIVERSITY

*Estimation of Economic Impacts of Cross-Border Infrastructure:
A General Equilibrium Application to Thailand and Lao PDR*

Peter Warr

Australian National University

Jayant Menon

Asian Development Bank

and

Arief Ahshory Yusuf

Padjajaran University, Bandung, Indonesia

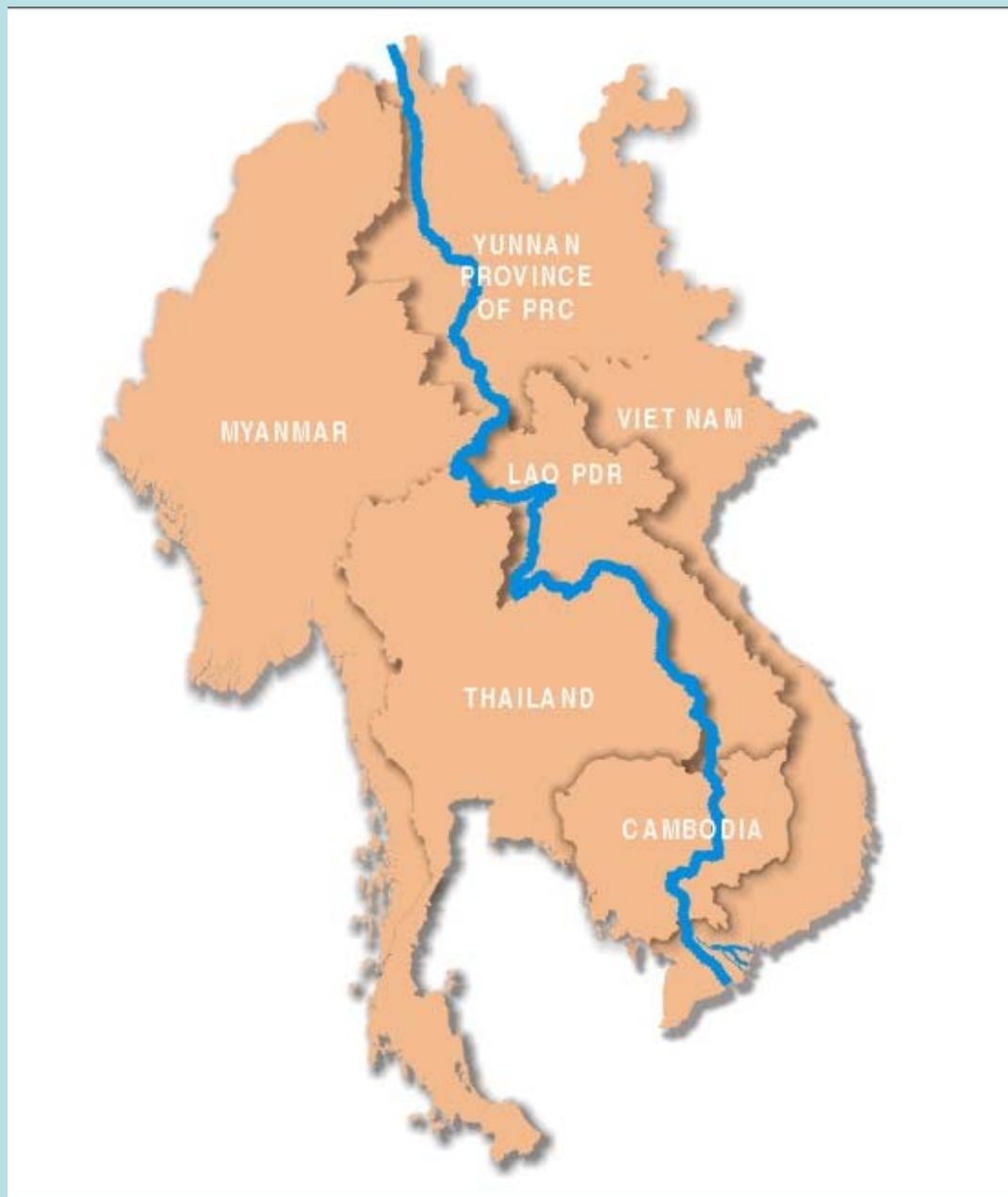
Outline

- 1. Mukdahan, Savannakhet and the East-West Economic Corridor**
- 2. Impact of an infrastructure project: what is the counterfactual?**
- 3. The Mukdahan-Savannakhet input-output table**
- 4. *M-SGEM*: A Mukdahan-Savannakhet general equilibrium model**
- 5. Shocks**
- 6. Results**
- 7. Conclusions: Who gets the benefits?**

Objectives

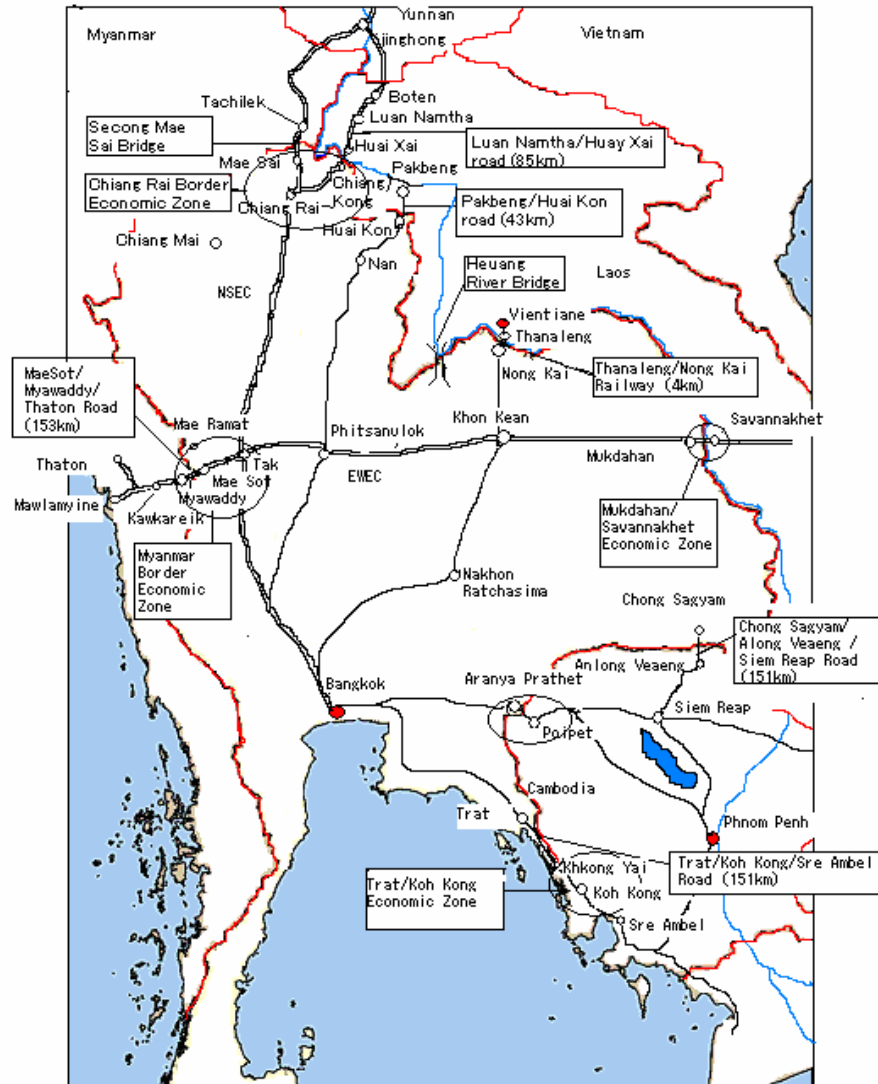
- 1. Empirical: what is the economic impact of this particular cross-border infrastructure investment?**
- 2. Methodological: is a regional general equilibrium model useful in answering this kind of question?**

The Mekong Region



The Mukdahan-Savannakhet bridge and road link

Figure 3 Thailand's Economic Cooperation toward Neighboring Countries



(Source) NEDA and NESDB













IGF

UN 1330

829



Final demand in Mukdahan and Savannakhet provinces (US\$ thousands)

	Mukdahan	Savannakhet
1 Household consumption	173,258	290,354
2 Investment	57,861	109,119
3 Government	36,487	8,957
4 Stocks	4,572	11,817
5 Exports to R.O.W.	90,808	76,927
6 Imports from R.O.W.	-135,518	-153,689
7 Regional exports	6,392	2,002
8 Regional imports	-2,002	-6,392
9 Net margin	357	-357
Total GDP	232,215	338,738

**Total sales within Mukdahan-Savannakhet regional economy
(US\$ thousands)**

		To:		
		Mukdahan	Savannakhet	Total
From:	Mukdahan	393,203	6,392	399,595
	Savannakhet	2,002	585,411	587,413

Initial levels of inter-regional trade

(thousands of US\$)

	Export from Mukdahan to Savannakhet	Export from Mukdahan to rest of the world	Export from Savannakhet to Mukdahan	Export from Savannakhet to rest of the world
1. Crops	0.7	23,580	342	4,150
2. Livestock	13.8	2	20	11,096
3. Forestry	4.5	34	0	1,120
4. Mining	0.0	2,300	0.9	30,746
5. Food	3,192	13,483	3	16,440
6. Textiles	1,464	6,652	23	977
7. Wood/paper	17	98	1,604	1,795
8. Chemicals	100	0	0	0
9. Minerals	999	82	0	0
10. Machinery	553	0	0	0
11. Other	0	0	0	0
12. Electricity &	0	0	0	0
13. Construction	0	126	0	0
14. Transport	50	6,439	10	319
15. Telecom	0	141	0	479
16. Trade	0	6,040	0	5,889
17. Banking	0	0	0	0
18. Real estate	0	0	0	0
19. Public sector	0	0	0	0.0
20. Personal services	0	32,079	0	35,940
Total	6,392	91,055	2,002	167,925

Transport Margins

(ratio to sales, %)

		To:	
		Mukdahan	Savannakhet
From:	Mukdahan	2.36	6.52
	Savannakhet	4.27	0.08

Model

- 1. We drew upon the Sim *et al.* regional input-output table for the Mukdahan-Savannakhet regional economy to build a regional computable general equilibrium model of this local economy**
- 2. We added transport margins to this structure to represent transport costs both within and between Mukdahan and Savannakhet**
- 3. We shocked this economy with reductions in the transport costs corresponding to trade *between* these two regions**

Shocks

Shocks to inter-regional transport margins

	Simulation 1		Simulation 2		Simulation 3	
/To	Mukdahan	Savannakhet	Mukdahan	Savannakhet	Mukdahan	Savannakhet
From/						
Mukdahan	0	-63.8	0	-31.9	0	-16.0
Savannakhet	-98.1	0	-49.1	0	-24.5	0

Closure

- 1. Real consumption in each region is endogenous**
- 2. Trade balance, real investment and real government spending in each region are exogenous**
- 3. External import prices are exogenous and exports face downward sloping external demand functions**
- 4. Exports of 'forestry' products from Savannakhet to Mukdahan and from Savannakhet to the rest of the world are exogenously fixed**

Results:

Summary of macroeconomic results

	Simulation 1	
	Mukdahan	Savannakhet
Macroeconomic impacts (% change)		
Real GDP	0.040	0.087
Real household consumption	0.183	0.025
Real export to R.O.W.	-0.403	0.223
Real import from R.O.W.	-0.057	-0.070
Real investment	0*	0*
Real government spending	0*	0*
Real wage	0.008	0.069
Consumer price index	0.046	-0.038
GDP deflator	0.054	-0.042
Inter-regional trade - real (% change)		
Sales to other region	8.772	16.094
Purchase from other region	16.094	8.772
Inter-regional trade (absolute change - 000 US\$)		
Sales to other region	562.4	322.8
Purchase from other region	322.8	562.4

Results (cont'd):

Absolute change in real GDP (\$US, thousands)

Simulation 1

	Mukdahan	Savannakhet
GDP	93.9	294.5
Household consumption	317.2	72.0
Investment	0.0*	0.0*
Government spending	0.0*	0.0*
Stocks	9.5	-0.7
Non-regional exports	-365.6	171.9
Non-regional imports (-)	76.7	107.3
Regional exports	562.4	322.8
Regional imports (-)	-322.8	-562.4
Net margin	-183.5	183.5

Results (cont'd)

Changes in industry outputs (% change

	Simulation 1	
	Mukdahan	Savannakhet
1. Crops	0.005	0.008
2. Livestock	0.008	0.000
3. Forestry	0.023	0.035
4. Mining	-0.003	-0.003
5. Food	0.100	0.008
6. Textiles	0.084	0.360
7. Wood/paper	1.066	0.185
8. Chemicals	0.364	0.631
9. Minerals	0.912	0.283
10. Machinery	2.211	0.085
11. Other manufacturing	0.000	-0.004
12. Electricity & water	0.020	-0.009
13. Construction	0.002	-0.001
14. Transport	-0.824	-6.527
15. Telecom	0.033	-0.006
16. Trade	-0.024	-0.022
17. Banking	0.056	-0.003
18. Real estate	0.016	-0.004
19. Public sector	0.000	-0.010
20. Personal services	0.003	-0.008

Results (cont'd):

Changes in inter-regional trade (absolute change US\$ '000)

	Simulation 1	
	Mukdahan	Savannakhet
1. Crops	0.06	30.61
2. Livestock	1.21	1.76
3. Forestry	0.40	0.00
4. Mining	0.00	0.08
5. Food	276.42	0.26
6. Textiles	151.39	1.41
7. Wood/paper	-0.27	284.74
8. Chemicals	11.70	0.00
9. Minerals	42.72	0.00
10. Machinery	43.50	0.00
14. Transport	34.63	3.30
TOTAL	561.77	322.16

Conclusions

- **In the case of the Mukdahan-Savannakhet bridge and associated roads, our results indicate that both regions benefit. The results do not support the notion that only the more advanced region benefits.**
 - **In the case of Savannakhet, the benefits consist mainly of exports of processed timber products.**
 - **General equilibrium modeling seemingly has promise as a way of estimating the benefits of large infrastructure project. It must be recognized, however, that this application of general equilibrium modeling is still in its infancy.**
 - **Limitations of this study: short run, dynamic effects not captured; impact focuses on effect within these two regions themselves, not national effects; effect on tourism not captured; smuggling not fully captured.**
- 5. Possible extensions:**
- **an income distributional version of the model which groups within Mukdahan and Savannakhet receive the benefits?**
 - **a dynamic version which allows for response of private investment**

Thanks for listening

