

Environmental Tax Reform for Low Carbon Green Growth:

Major findings and policy implications from a multi-regional economic simulation analysis

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The Inconvenient Truth (by Nordhaus)

- Carbon Price
"Cap & trade"
or
"Carbon Tax"



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International or Unilateral

- Ideal:
Internationally harmonized C-tax
- Reality:
Unilateral C-tax by a forerunner

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Is an unilateral
carbon tax
not harmful to your
economy?

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Environmental Tax Reform (ETR)

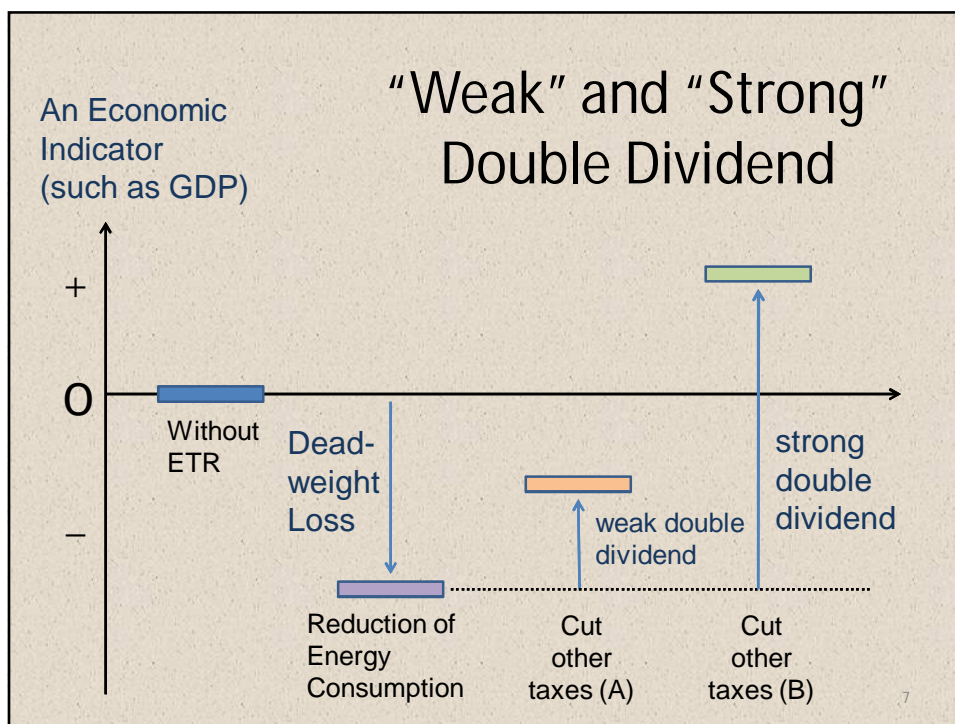


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The Double Dividend



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CGE Model

Computable General Equilibrium

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Our Global CGE Model

- GTAP Database and GTAP EG
- Environmental Tax Reform and Border Tax Adjustment

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Border Tax Adjustment? (BTA)

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20 Regions

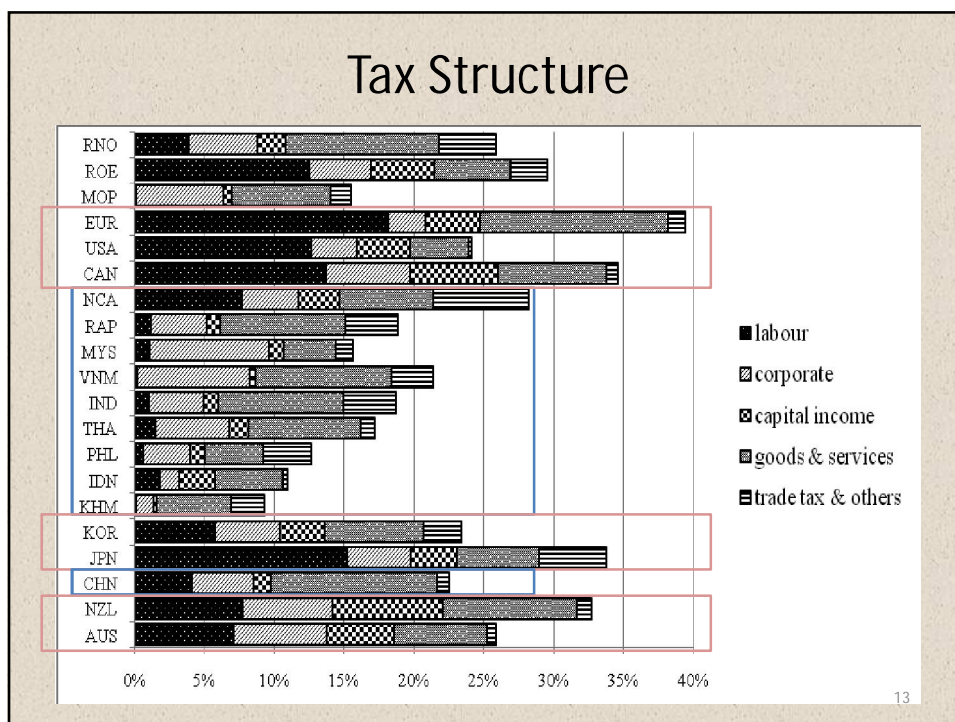
<u>AUS "Australia"</u>	<u>VNM "Vietnam"</u>
<u>NZL "New Zealand"</u>	<u>MYS "Malaysia"</u>
<u>CHN "China"</u>	<u>RAP "Rest of Asia Pacific"</u>
<u>JPN "Japan"</u>	<u>NCA "North and Central Asia"</u>
<u>KOR "Rep. of Korea"</u>	CAN "Canada"
<u>KHM "Cambodia"</u>	USA "United States"
<u>IDN "Indonesia"</u>	EUR "EU27"
<u>PHL "Philippines"</u>	MOP "Major Oil Producers"
<u>THA "Thailand"</u>	ROE "Rest of World (OECD)"
<u>IND "India"</u>	RNO "Rest of World (non OECD)"

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Production Sectors and Goods

AGR "Agriculture, forestry and fishery"
 OMN "Mining"
 FPR "Food products"
 TWL "Textiles-wearing apparel_leather"
 LUM "Wood products"
 PPP "Paper products - publishing"
 CRP "Chemical - rubber - plastic products"
 NMM "Mineral products nec "
 I_S "Ferrous metals"
 NFM "Non-ferrous Metals"
 FMP "Metal products"
 MMF "Machinery"
 OMF "Manufactures nec"
 CNS "Construction"
 SER "Services sectors"
 COL "Coal"
 OIL "Crude oil"
 GAS "Natural gas"
 P_C "Petroleum and coal products"
 ELY "Electricity"
 CGD "Savings good"

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Variation of Scenarios (1)

- To tax or not to tax
Business as Usual (BAU)
or Carbon Tax (10\$/tCO₂)

Variation of Scenarios (2)

- Revenue Recycling?
 - (1) Lump-sum [LUM]
 - (2) Labor Tax cut [LAB]
 - (3) Corporate Tax cut [CPR]
 - (4) Consumption Tax cut [CON]

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Variation of Scenarios (3)

- Where?
 - (1) Worldwide,
 - (2) Asia-Pacific,
 - (3) Unilateral

Note: assume EU always reduces CO₂ by 15%

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Variation of Scenarios (4)

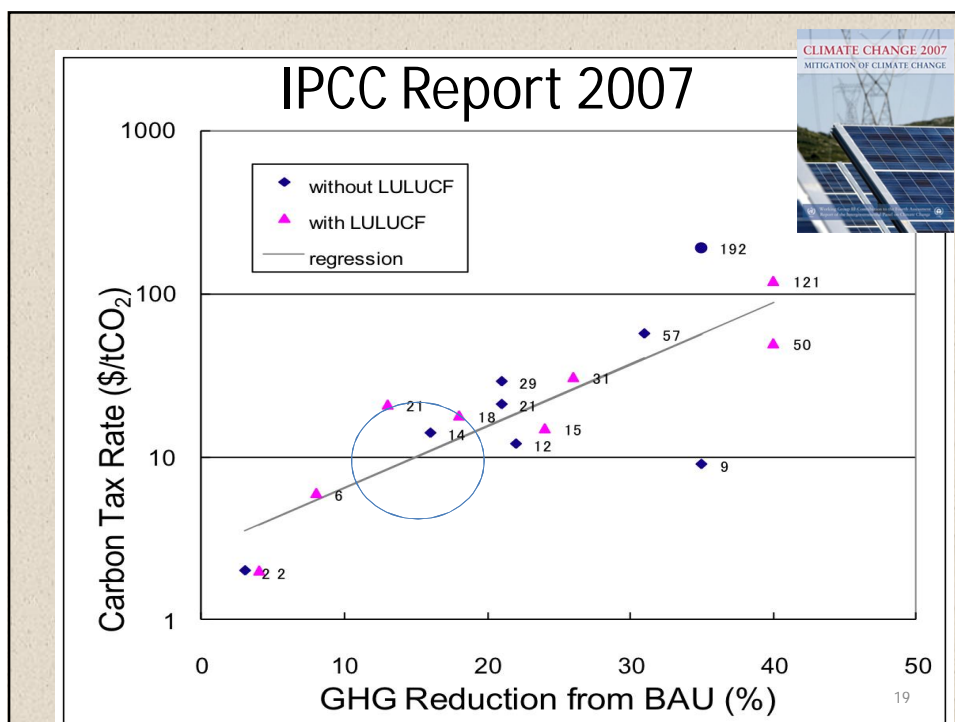
- Anti Leakage Measures
 - (1) Without BTA,
 - (2) with BTA (all sectors)
 - (3) Special Treatment
(80% reduction of C-Tax only
for Steel, Cement, Pulp, and Chemical)

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World-wide Scenario (WW)

- C-Tax rate: 10 \$/tCO₂
- CO₂ Reduction: 11 – 12 % (world)
e.g. Korea 6 – 7%,
Japan 2 – 3%,
China ca 20%

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Asia-Pacific Scenario (AP)

- C-Tax rate: 10 \$/tCO₂
- CO₂ Reduction: 8 %
 (world, 67% of WW scenario)
 e.g. Korea 7%, Japan 2.5%, China 20%

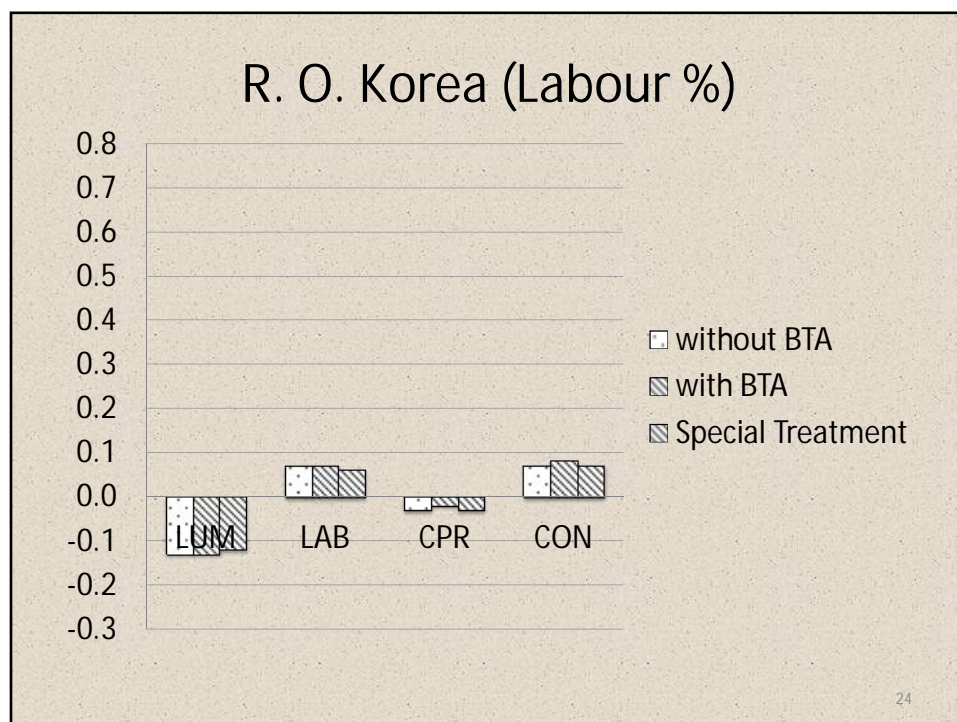
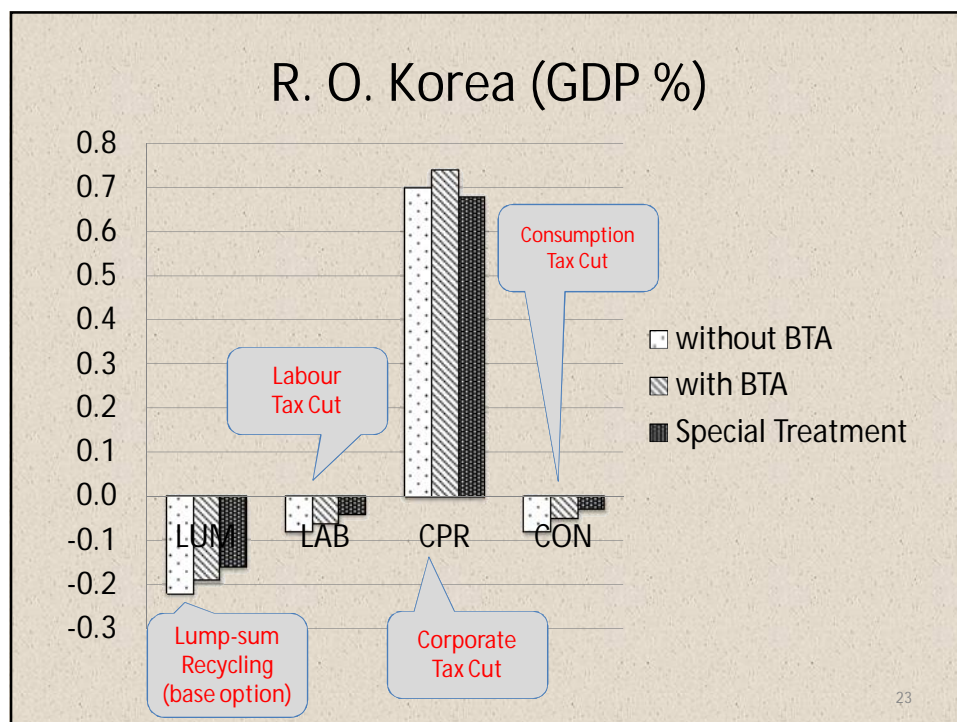
Unilateral ETR

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Unilateral Rep. of Korea (See Table 11, p. 21)

- C-Tax Rate: 10\$/tCO₂
- World CO₂: -1.6% (ROK -0.1%)
ROK's CO₂: -8%
- C-Tax Revenue: 0.45% of GDP
1.5% of Tax Revenue

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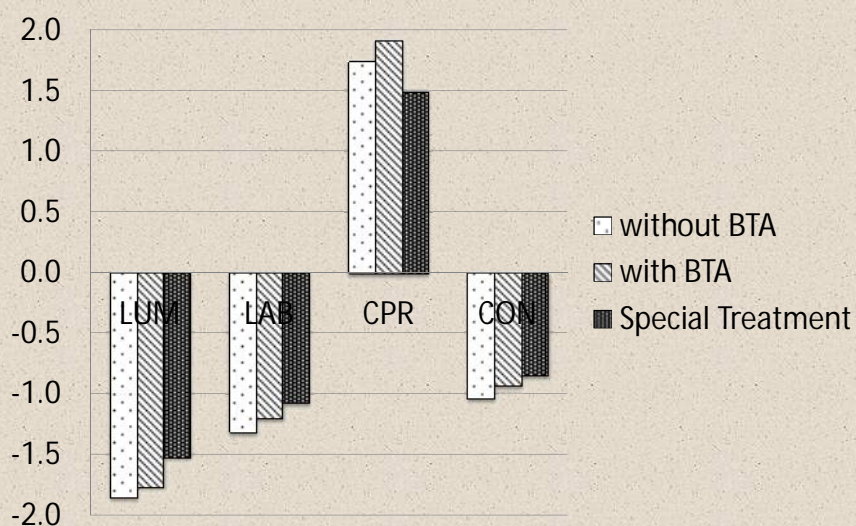


Unilateral China (See Table 13, p. 23)

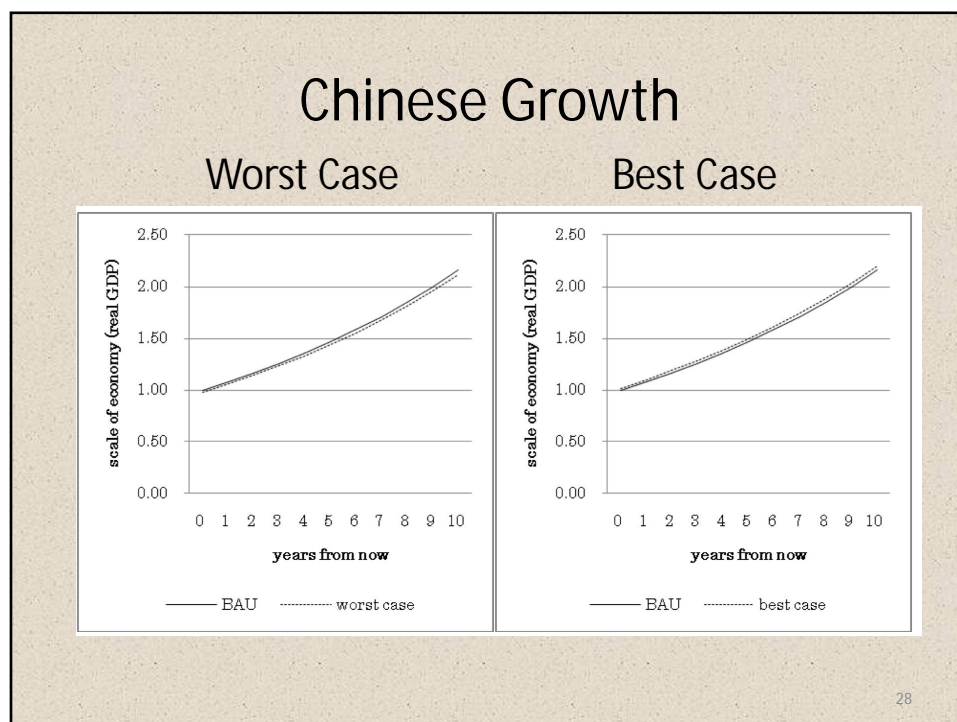
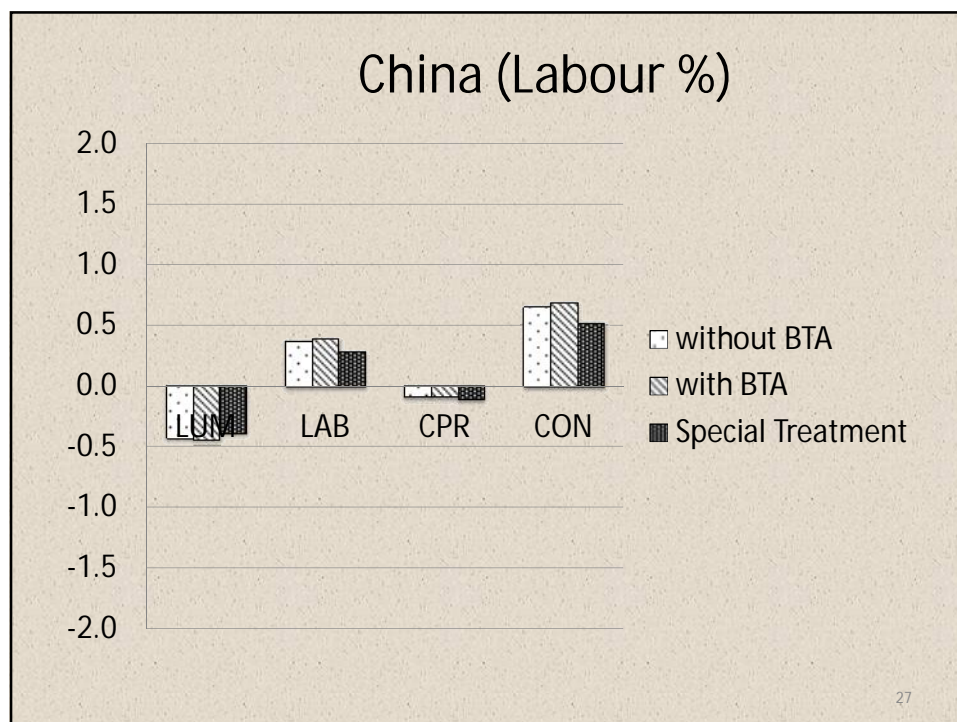
- C-Tax Rate: 10\$/tCO₂
- World CO₂: -5% (China ca -3%)
China's CO₂: -16 to -21%
- C-Tax Revenue: 1.5% of GDP
5% of Tax Revenue

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China (GDP %)



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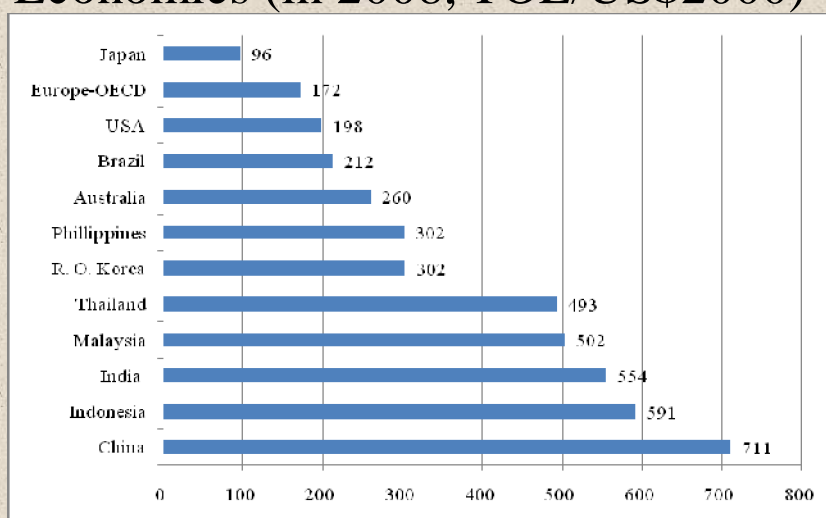


Conclusion

- Possibility of ETR in Developing Countries:
Double Dividend
Higher Share of C-Tax in Tax Revenue
- Best way of Revenue Recycling?
CPR for GDP

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Figure 1: Energy Intensity of Major Economies (in 2008, TOE/US\$2000)



Source: EDMC(2011) 30