“Sustainable freight transport in support of the 2030 Agenda for Sustainable Development”

What do we know about the potential impacts on states arising from shipping GFG reduction

by

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WHAT DO WE KNOW ABOUT THE POTENTIAL IMPACTS ON STATES ARISING FROM SHIPPING GHG REDUCTION

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OUTLINE

1. Impacts on states
2. Relationship between shipping’s GHG reduction and transport costs
3. Wider relationships between GHG reduction, trade and development
4. Findings from literature on impacts on import costs
5. Relationships between impacts on import costs, trade and GDP
6. Summary of wider impacts
WHAT DO WE MEAN BY IMPACTS ON STATES?

1. geographic remoteness of and connectivity to main markets;
2. cargo value and type;
3. transport dependency;
4. transport costs;
5. food security;
6. disaster response;
7. cost-effectiveness; and
8. socio-economic progress and development.
WHAT ARE WE NOT COVERING IN THIS PRESENTATION?

1. geographic remoteness of and connectivity to main markets;
2. cargo value and type;
3. transport dependency;
4. transport costs;
5. food security;
6. disaster response;
7. cost-effectiveness; and
8. socio-economic progress and development.

TECHNOLOGY CHANGES ASSOCIATED WITH DECARBONISING SEA TRANSPORT, MAY OR MAY NOT INCREASE TRANSPORT COST

Increased capital costs and fuel costs - increase in transport cost

Increased capital costs but lower operating cost - no net increase or even a decrease in transport costs
TRANSPORT COSTS ARE A SMALL COMPONENT OF TRADE COSTS

- **Diverse share** of maritime transport costs in product values, e.g., 5% (manufacturing) vs. 11% (agriculture) vs. 24% (raw materials industry)
- **Wide range** of transport costs across products and countries of origin and destination

Source: Rojon et al. (2018)

WIDER POTENTIAL LINKS BETWEEN GHG MITIGATION POLICIES AND ECONOMIC IMPACTS

- Impact on transport costs
- Impact on shippers’ behavior (Transport analysis)
- Impact on trade costs
- Impact on GDP and trade (Economic analysis)

Source: Halim et al. (2018)
EXAMPLE FINDINGS FROM LITERATURE IMPACTS ON COSTS OF IMPORTS

Source: Rojon et al. (2018)

Change in transport cost

PRESENT

$10-30/t

DECARB

0.4-16% increase

Change in cost of import

PRESENT

<1%

DECARB

Manufacturing costs

Trade costs

Change in cost of import

$10-50/t

TRADE AND GDP

Consumption: 100t

Import costs: $50/t

Import volume: 70t

State A

Import costs: $70/t

Import volume: 30t

State C

State B

• **Consumers will substitute products** from different producers depending on the changes in import prices
• **States with higher import costs might not be favorable over states with lower import costs anymore causing shift of volume of demand.**
### TRADE AND GDP

Potential asymmetric increase in import costs due to GHG mitigation measures could lead to:

- Decline of export in State C which could lead to decline in GDP
- Increase of export in State B could lead to increase in GDP

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### SUBSTITUTION CAN ALSO OCCUR TO DOMESTIC PRODUCTION

Depending on the commodity and state, an increase in trade costs can also result in a shift to increased domestic production, which can increase employment, reduce trade imbalance and increase welfare.
TRADE, GDP AND SHIPPERS' BEHAVIOUR

Generally, modest impact on:
- GDP of individual countries (-0.02% to -1%)
- Mode shift from sea to land based transport (-0.16%)

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<th>Economic Indicators</th>
<th>Findings</th>
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<td>Lee et al. (2013)</td>
<td>Carbon price 30, 60, 90 USD/ton CO2 for the year 2007</td>
<td>Real GDP</td>
<td>-0.002% to +0.004%, Global average : -0.0003%</td>
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<td>Volume of container flows</td>
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<td>Reduction of 925 KTEU (Twenty-Foot Equivalent Units) globally</td>
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<td>Sheng et al. (2018)</td>
<td>Carbon price 40 USD/ton CO2 by 2030</td>
<td>Real GDP</td>
<td>-0.06% to +0.001%</td>
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<td>GDP growth</td>
<td></td>
<td>-0.17% to +0.01%</td>
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<td>L.A. Tavasszy et al. (2014)</td>
<td>Carbon price 49 euros/ton CO2 by 2040</td>
<td>Global trade flows</td>
<td>- 0.9% in total trade flows</td>
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<td>Commodity trade flows</td>
<td></td>
<td>-0.2% (food) to -4.2% (agriculture)</td>
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<td>Anger et al. (2013)</td>
<td>Carbon price 10,30,50 euros/ton CO2 by 2025</td>
<td>Real GDP</td>
<td>&lt;0.01% in global GDP</td>
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<td>real GDP changes for developing countries</td>
<td></td>
<td>-1% GDP for one country</td>
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<td>&lt;0.2% for majority</td>
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<td>Halim et al. (2018)</td>
<td>Slow steaming (25-65% speed reduction), and carbon price on maritime transport with 100% increase in maritime transport by 2030</td>
<td>Volume of international maritime transport</td>
<td>-34 Mtonnes in demand for maritime transport</td>
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<td>Shift to freight rail mode (e.g. Eurasian railways)</td>
<td></td>
<td>-0.16% in modal share of maritime transport.</td>
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SUMMARY

- There are a number of potential impacts on states arising from GHG reductions in shipping
- The most obvious impacts relate to risks of increase transport costs, and related impacts on trade - relevant to both importers and exporters
- Other types of potential impact include risks to food security, disaster response provisions
- Generally, even a modest increase in transport cost will only have a small to negligible impact on total import costs (as a % change in the price of a good)
- When also taking into account potential reconfiguration of trade, overall impacts on GDP are mostly expected to be small
- Risks are normally greatest to flows of low value commodity over long distances and where trade is a key influence on costs of living or economic development, and particular attention should be paid to assess impacts in these cases
UNDERSTANDING THE ECONOMIC IMPACTS OF GHG MITIGATION POLICIES ON SHIPPING

WHAT IS THE STATE OF THE ART OF CURRENT MODELLING APPROACHES?

Full research paper forthcoming, currently being finalized and reviewed with support from

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