To comply or not comply …

Efficient and fair pest risk mitigation through clever incentive design

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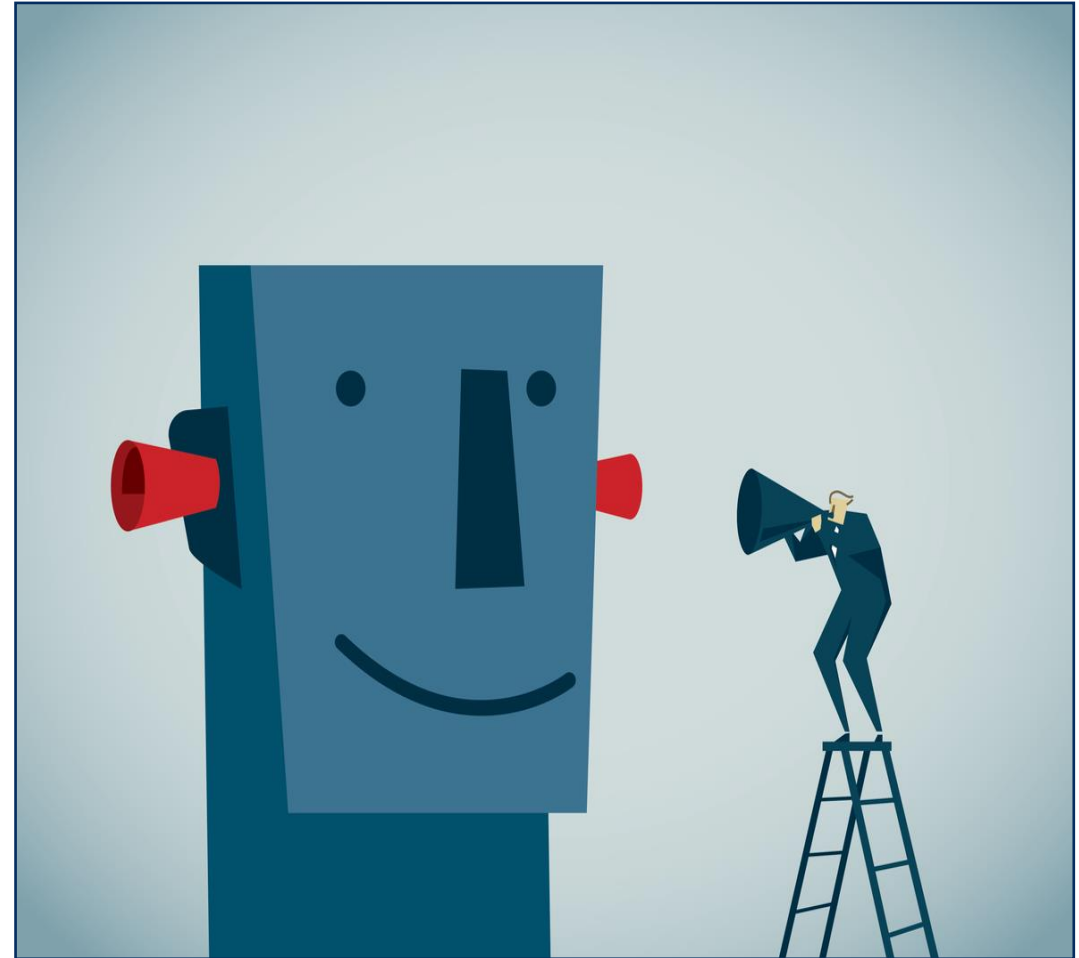https://www.thomasnet.com/insights/container-shipping-by-the-numbers/

Question

- Fair (risk creator pays)
- Efficient (achieve policy goal at lowest cost)
- Incentive-compatible (encourage desirable behaviour)

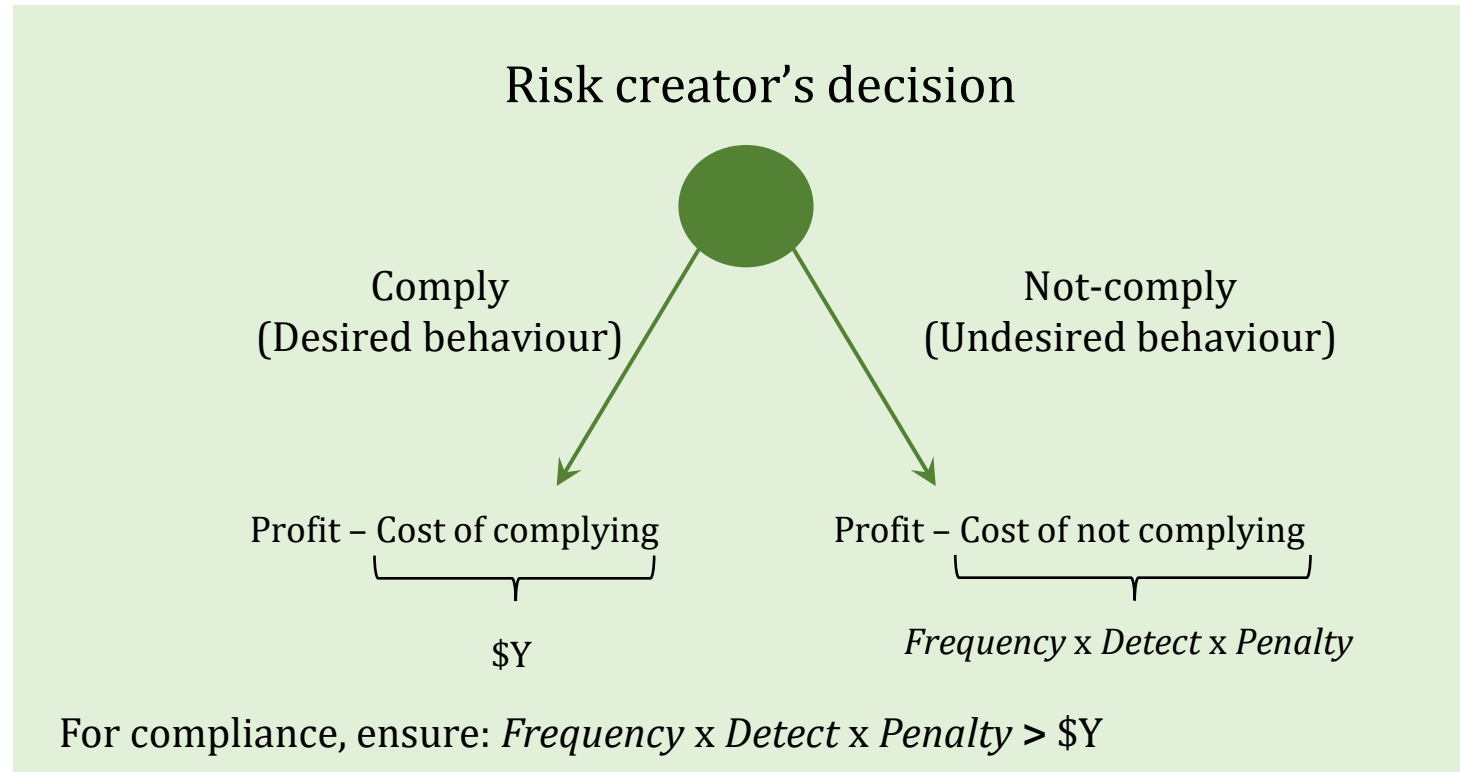Can we design effective pest risk mitigation policies that minimise negative impacts on international trade?

Designing effective risk mitigation policies

Key points:

- Humans behave strategically and respond to incentives

- Every policy carries incentives for particular behaviour

- So, focus on incentive properties of policies:
   - Create 'incentive-compatible' policies

Designing incentive-compatible policies

Risk creator's decision

Comply
(Desired behaviour)

Not-comply
(Undesired behaviour)

Profit – Cost of complying

Profit – Cost of not complying

$Y

Frequency x *Detect* x *Penalty*

For compliance, ensure: *Frequency* x *Detect* x *Penalty* **>** $Y

- Create incentive-compatible rules/policies:
  - Make the 'best' decision for importer **=** the desired one from the biosecurity agency's standpoint

For example: biofouling risk insurance

Niche areas of ships often have high levels of biofouling

Internal seawater systems

Rudder

Rudder hinge

Propeller

Sea chest

Bilge keel

Bow thruster
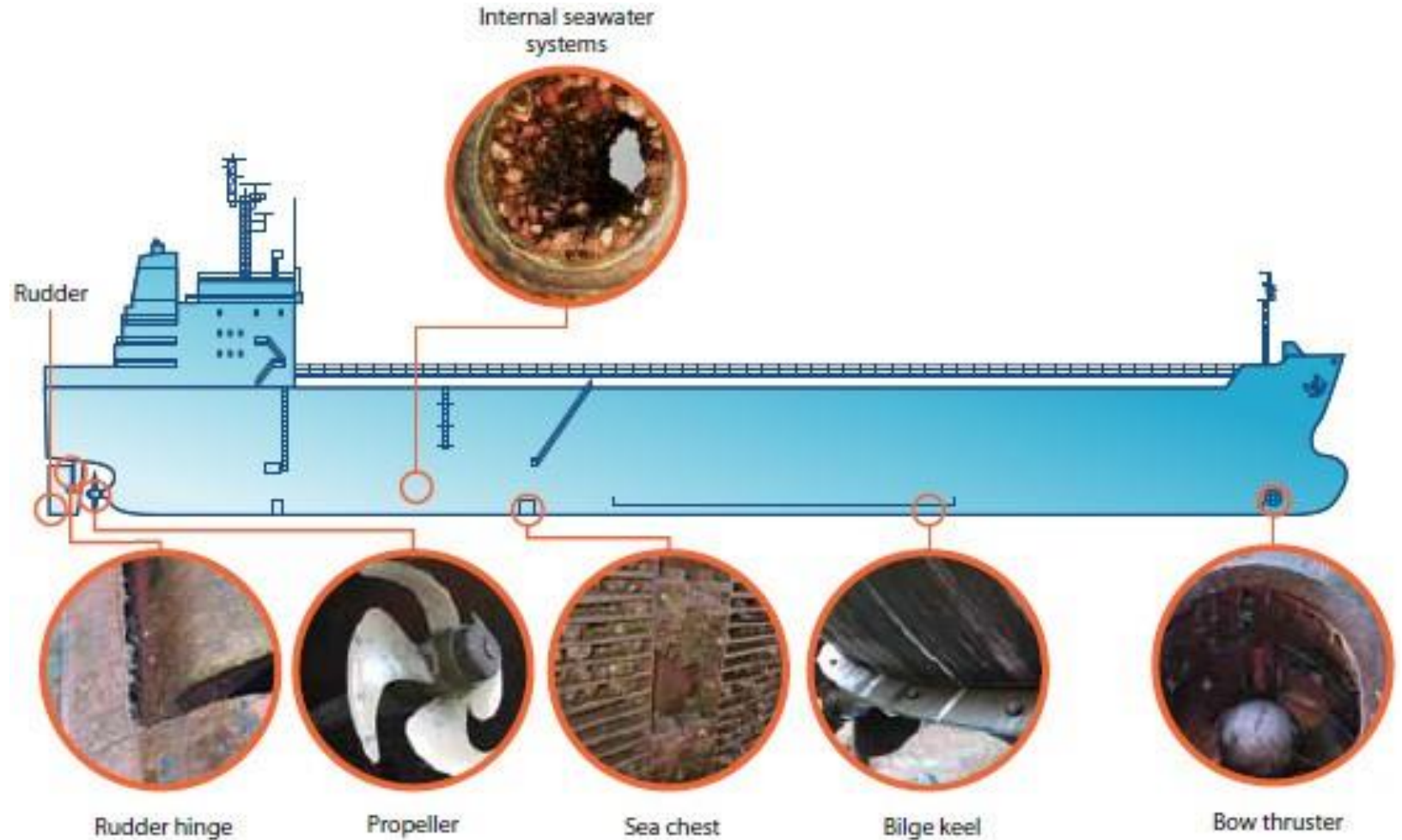
For example: biofouling risk insurance

- Vessel operators required to purchase biofouling risk insurance
  - Premiums calculated by actuaries based on biofouling risk posed by vessels
  - Compulsory premium is the incentive needed to change behaviour

- Link risk-rating to verifiable BMPs
  - No verifiable BMPs = high risk, high premiums
  - **Incentives to reduce biofouling risk**

- Insurance pool (accumulated premium payments)
  - Funds biosecurity agency costs, incl surveillance
  - Funds response effort
  - Financially sustainable model

Conclusion

- Consider strategic risks, and use the disciplines best placed to do this
    - Actuaries, (market design) economists ...

- Technology for verification and detection is very important

- Creating fair, efficient and sustainable biosecurity systems is a multi-disciplinary task

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