VIRTUAL WATER TRADE, ECONOMICS, AND ENVIRONMENTAL POLICY

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BETTER POLICIES FOR BETTER LIVES

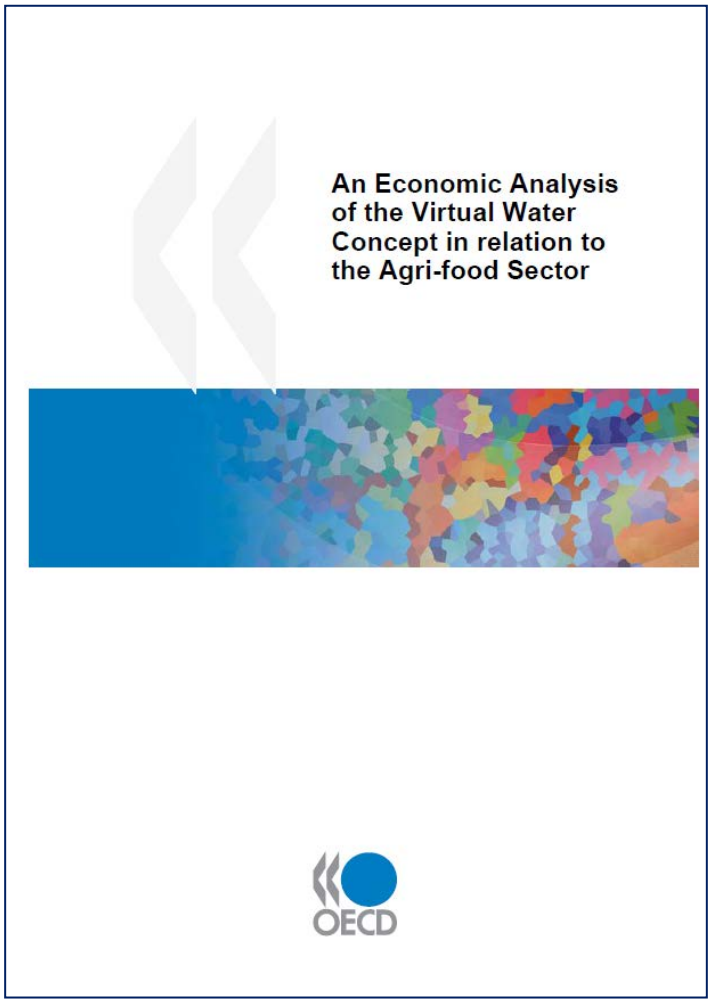
From concept to application

- **Virtual water:** "water contained in the food that the region imports" (Allan 1998)
- Linked to the concept of **water footprint**
- Subject of a **growing number of papers**

Two questions:

1. Does virtual water trade make economic sense ?
2. Usefulness of the concept in policy?

Method



- Largely based on Wichelns (2010) http://dx.doi.org/10.1787/9789264083578-8-en

- Additional recent articles and papers from the literature

1.A. Trade economics' perspective

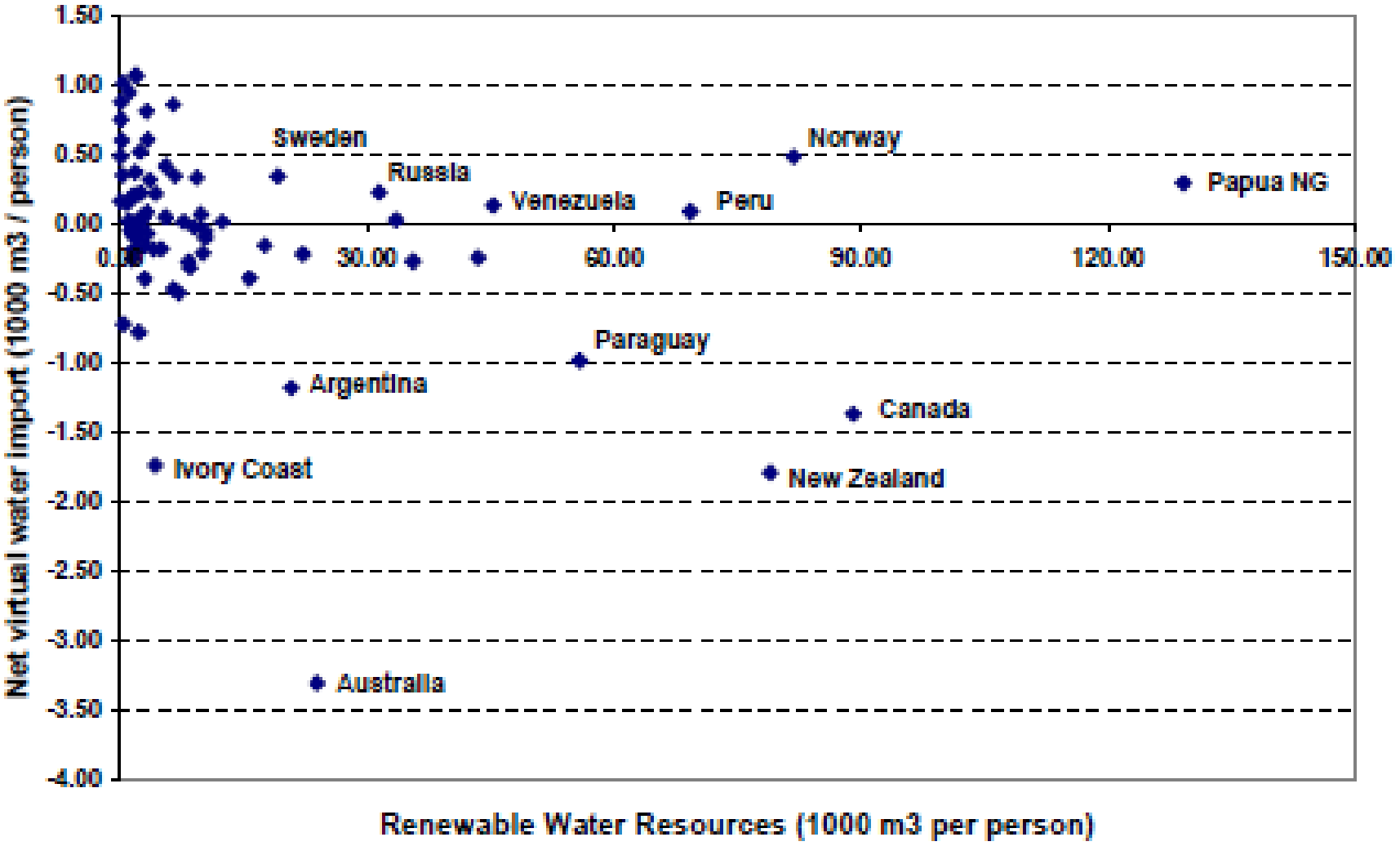
Positive aspect: Is virtual water trade linked to water resources?

- **Ongoing theoretical discussions**
  - **Ricardo model**: technology differences
    - Wichelns (2010): absolute not comparative advantage vs. Reimer (2012)
  - **Hecksher-Ohlin models:** endowment differences
    - HOS: not valid as such (Ansink 2010;Lenzen et al. 2012)
    - HOV : hypothesis verified (Reimer 2012)
  - **Ricardo-Viner model :** specific factor model
    - With land fixed, hypothesis confirmed (Coussin 2012).

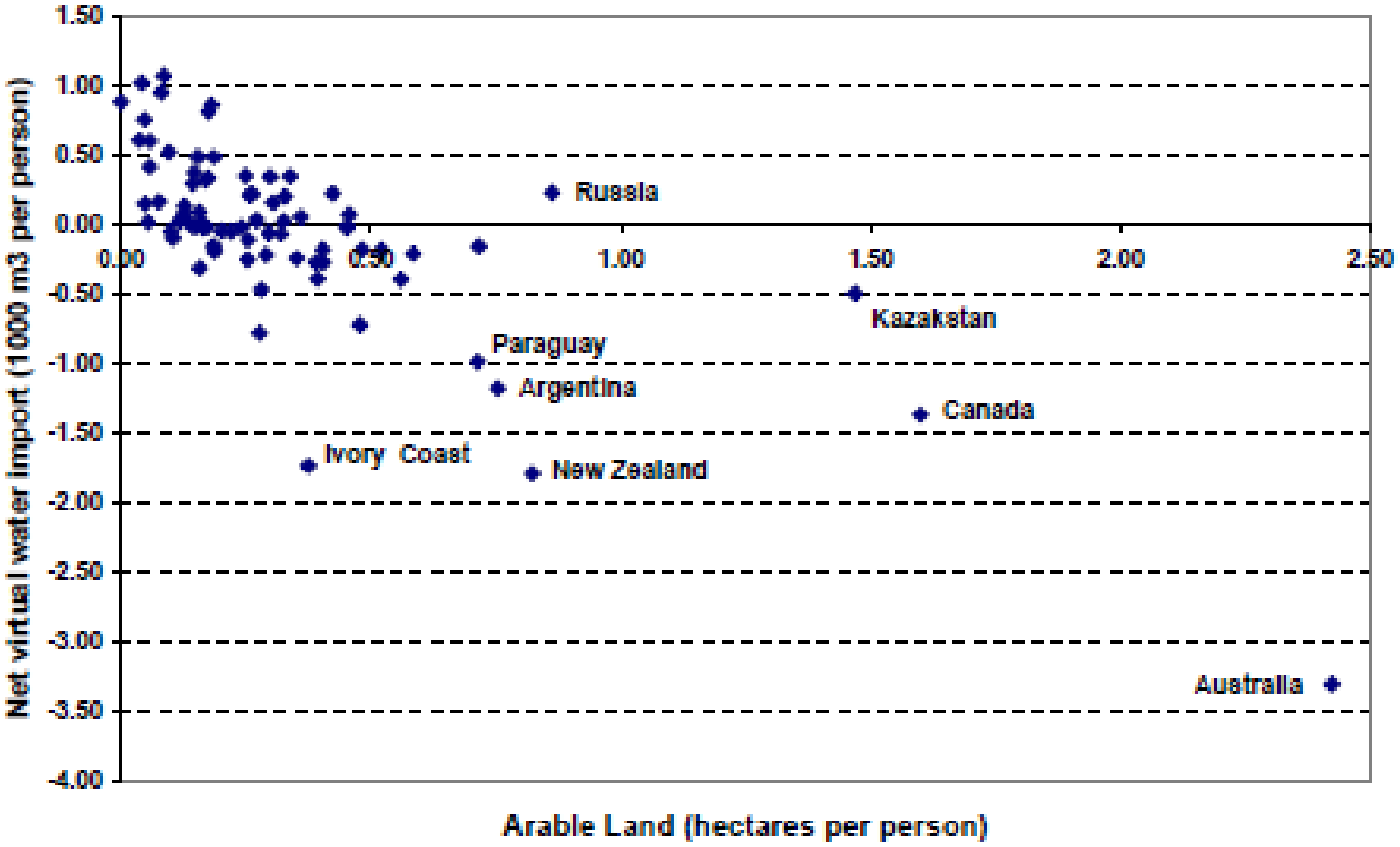
Empirical evidence

- **Not supportive of link**
  - **Except when considering other factors**
    - Capital, arable land, scarcity (Ansink 2010, Coussin 2012, Kumar and Singh 2005)
  - **Or specific goods and countries**
    - Grain imports for water scarce countries (Yang et al. 2003)

Water endowment not a good explanatory factor for net virtual water import (Wichelns 2010)



Arable land is a better pick



Normative aspects

- Can trade create water savings?
  - 5% "saved" (Hoekstra 2010)?
  - Will not redress inequalities (Seekell et al. 2011)
  - Concept is "vague, inconsistent and paternalistic" (Gawel and Bernsen 2011)
- Water quantity is not a good proxy for the opportunity cost of water resources
  - Reverse examples South Africa/SADC (Dabrowski et al. 2008)
  - Policy differences matter: irrigation subsidies (Wichelns 2010)

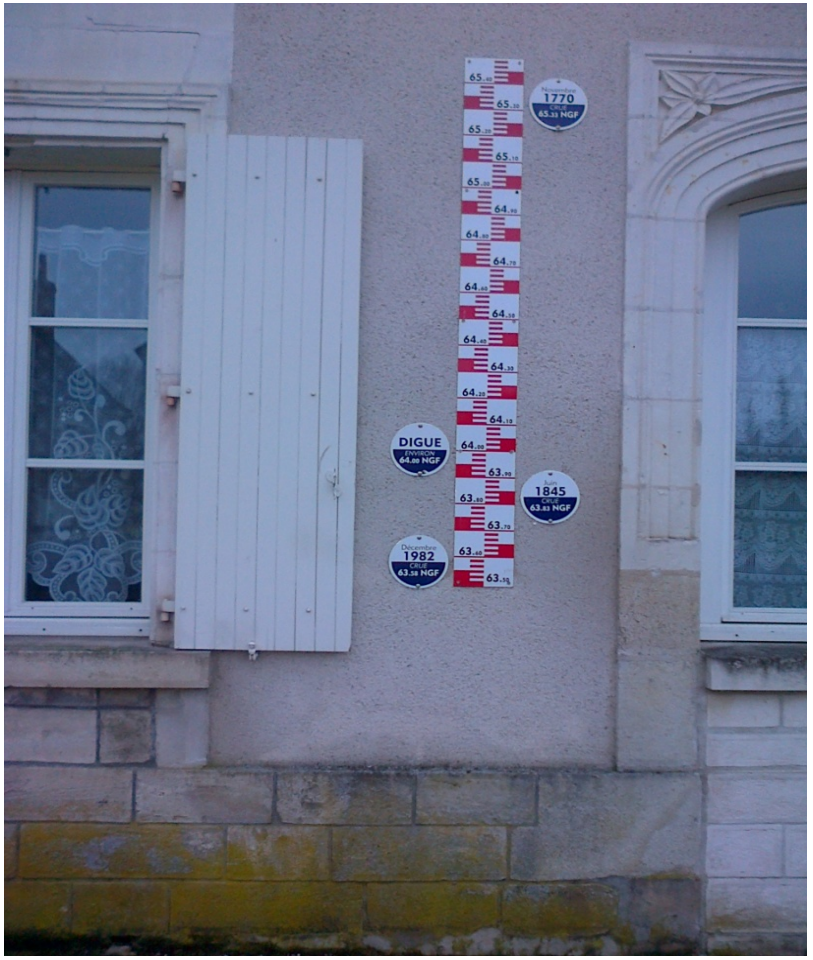
1.B. Environmental economics' perspective

- **Looking for first-best solutions**
  - Subsidiarity (WWF-SDC 2010, Wichelns 2010)
- **Finding the right value for the resource**
  - Pricing water is essential as a market signal
- **Embedded water quantity is not a good signal for water resource valuation and management**

2. Moving towards policy?

- **A useful concept to raise the issue of water use**
  - Good for communicating imbalances, hotspots and management tool (Rulli et al 2013, WWF-SDC 2012)
- **But not a valid environmental policy indicator**
  - Not based on a legitimate conceptual framework (Wichelns 2010)
- **Limited role to play in policy**
  - “Leads to inefficient and ineffective policy” suggestions (Gawel and Bernsen 2011): labels, tax, quotas hard to justify.

Opportunity costs and variations do matter



Thank you for your attention!

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