

# **Is the economy (de)materializing?**

**A comparison of Germany, China and Spain**



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# DEMATERIALIZATION

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Reduction in the amount of materials needed for the economic process, or a reduction in the quantity of material used per unit of economic output -  
also called “intensity of material use”

**Dematerialization debate mainly onset by *Limits to Growth***

(Meadows and Club of Rome, 1972)

concerns about

- the exhaustion of both material and energy **supply**
- the assimilative capacity of the environment (**sinks**)

# Hypothesis

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**Economic and material/energy growth can be delinked**

**vs.**

**Economic and material growth are two sides of the same coin**

# Measures of economic growth

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## GDP

Economic growth as measured conventionally with GDP at constant prices is problematic in several ways.

GDP excludes non monetary transactions and negative externalities

Hedonist psychology shows that correlation between GDP and happiness in the western world no longer holds

→ societal happiness has been declining for the past thirty years

# ALTERNATIVE measures of economic growth

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## ALTERNATIVES:

- **Index of Sustainable Economic Welfare** (Daly *et al.* 1989)
- **Genuine Progress Indicator** (Redefining Progress 1995)
- **Green GDP** (El Serafy *et al.* 1989)

$$SI = GDP - 2Ca - 1Cu + 1Bu$$

## HAPPINESS

Bhutan's "Gross National Happiness"

$$I = (HLY) / (GHG) \quad (\text{Common, 2005})$$

# PHYSICAL measures of the economic process

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## ALTERNATIVES - Intensity of material use :

- Ecological Footprint
- Ecological Rucksack
- Material Input per Unit Service (MIPS)
- Material and Energy Flow Analysis (MEFA)
- Domestic Material Consumption (DMC)
- Life Cycle Inventory (LCI)

How calculated ?

Boundaries ?

Minimization of such indicators always equivalent to environmental improvement ?

# Dematerialization: an Industrial Ecology's dream

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**“conservation” principle replaces “throw-away” culture:  
durable products treated as capital assets rather than consumables**

Doing more with Less:

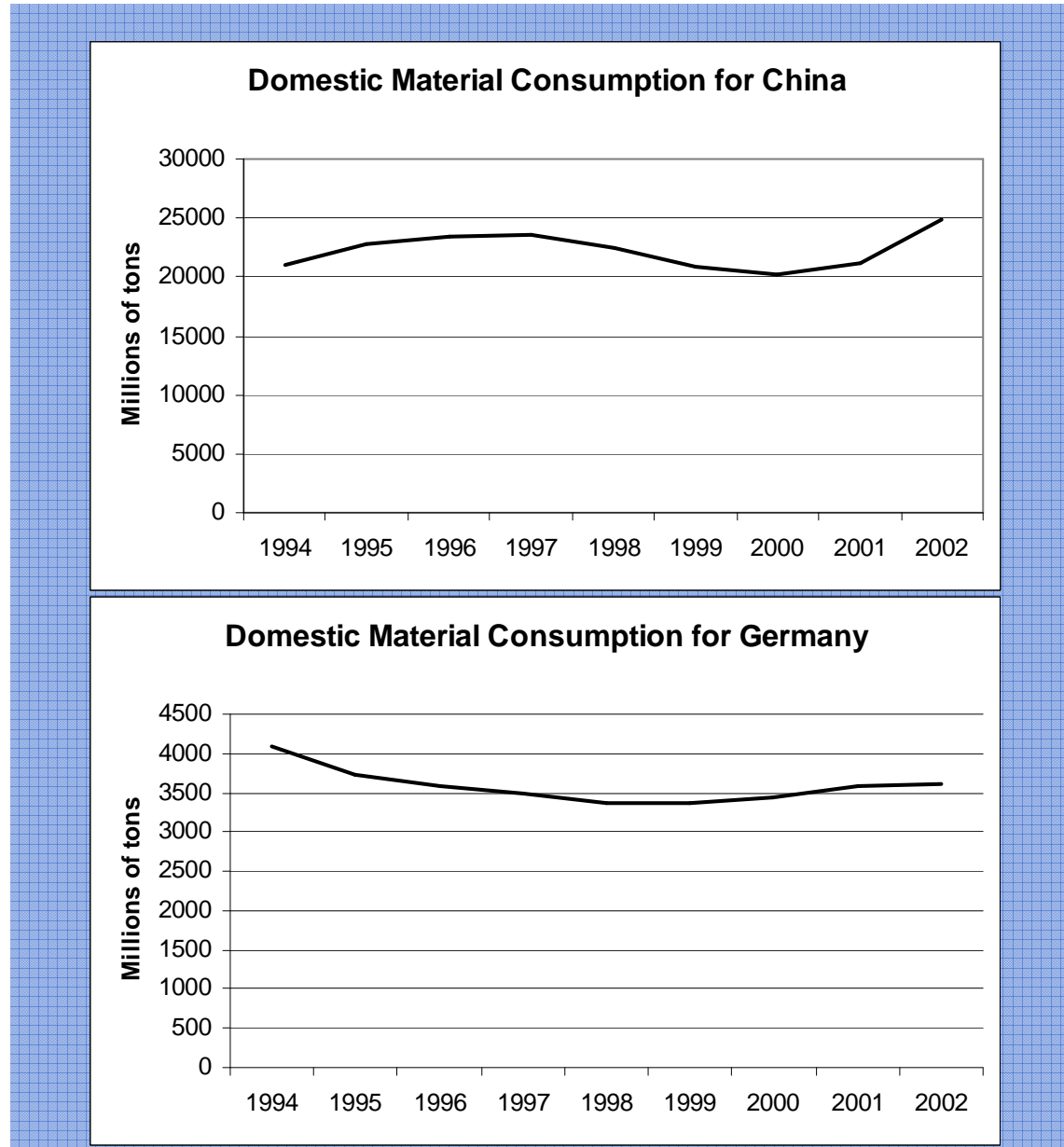
**Factor 4**

**Factor 10**

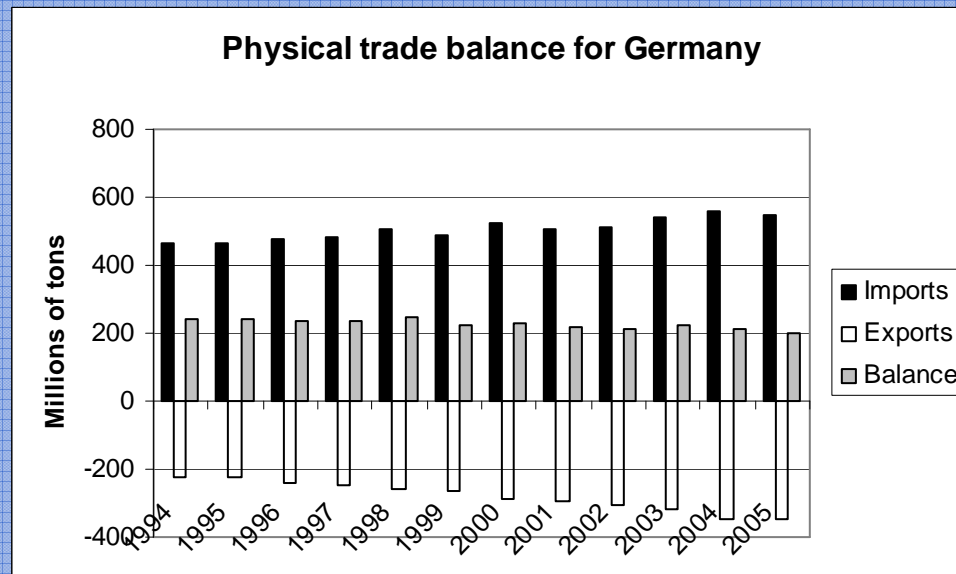
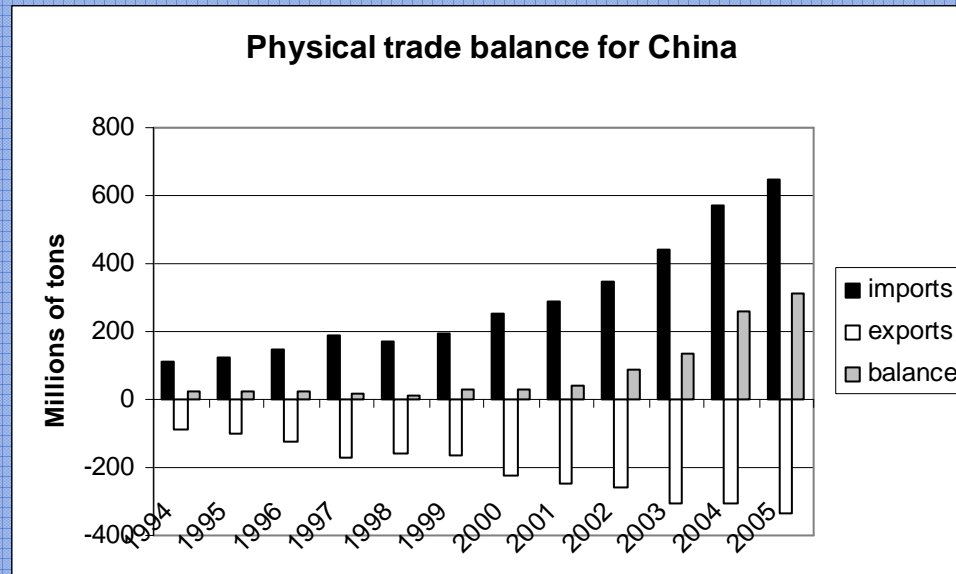
**Reasonable... but daunting**

**Gospel of efficiency & Jevons' paradox**

# RESULTS: evidence from Germany and China



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# Absolute vs. Relative Dematerialization

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	<b>DMC</b> (%)	<b>GDP</b> (% constant 1995 prices)	<b>PTB</b> (% - 1994 to 2005)	
<b>Spain</b> (1980-2000)	78.5	74	110	<b>Materialization</b>
<b>China</b>	17.6	70.2	1175	<b><u>Relative</u></b> <b>dematerialization</b>
<b>Germany</b>	-11.8	12.1	-17.3	<b><u>Absolute</u></b> <b>dematerialization</b>

**Dematerialization should be differentiated in two ways.**

# Basic needs and material wants

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**“conspicuous consumption”** (Veblen 1899)

**“Positional goods”** (Hirsch 1976)

**Basic needs are shared by everyone and are finite and few**

(Max-Neef *et al.* 1991)

**The good news ecologically:**

**seems possible to actually have more satisfaction with less stuff**

**Quality of life and happiness tricky to measure and still have no political value compared to GDP growth**

## CONCLUSION

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- **absolute dematerialization of the economy is largely a red herring**
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- **new satisfactors of needs must be less material and energy intensive.**

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- ...meaning less use of materials and energy while sustaining and maintaining happiness.
- economic degrowth remains, however, a political taboo