

On the Relationship between Eco-efficiency of Consumption and Income

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Hyun-Hoon Lee
(Kangwon National University, Korea)



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Introduction

Purposes of Presentation

1. What are “environmental sustainability” and “eco-efficiency of consumption”?
2. Is the current form of economic growth environmentally sustainable?
3. What is the pattern of eco-efficiency of consumption in the Asia-Pacific countries?
4. What is the empirical relation between eco-efficiency of consumption and income?
5. Policy Implications?

slide 1

1. What are environmental sustainability and eco-efficiency of consumption?

Environmental sustainability

- **Environmental sustainability:** the continuity of the ecological carrying capacity more or less infinitely into the future.
 - To ensure growth environmentally sustainable, **environmental pressure** should remain within the limit of ecological carrying capacity.
- **Environmental Pressure:** The actual load that is imposed on the environment by people.
 - It changes with (1) population (2) per capita consumption (amount and pattern), and (3) the energy and resource efficiency with which goods and services are produced.

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1. What are environmental sustainability and eco-efficiency of consumption?

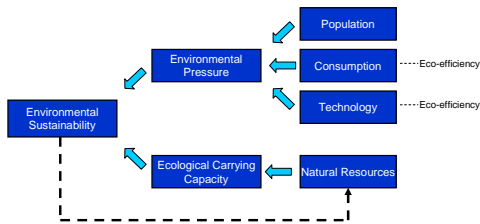
Environmental sustainability (continued)

- **Environmental carrying capacity:** the "maximum load" (the maximum rates of resource harvesting and waste generation) that can safely be imposed on the environment by people so that it can be sustained indefinitely.
 - it is largely determined by the natural resource endowment and hence tends to remain constant over time.
 - However, it can be increased by protecting, conserving, and restoring ecosystems and biodiversity.

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1. What are environmental sustainability and eco-efficiency of consumption?

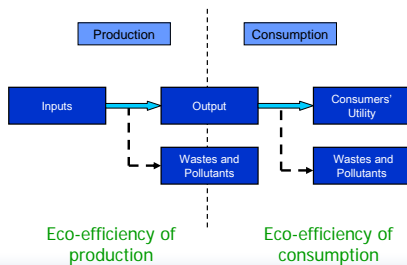
Figure 1. Determinants of Environmental Sustainability



slide 4

1. What are environmental sustainability and eco-efficiency of consumption?

Figure 2. Flows of Production and Consumption



slide 5

1. What are environmental sustainability and eco-efficiency of consumption?

Eco-efficiency and Green Growth

- **Green Growth** is concerned with increasing eco-efficiency of production and consumption:
- **Increasing eco-efficiency of production:** Creating more value added with less use of raw materials and energy and with reduced emissions of wastes and pollutants.
- **Increasing eco-efficiency of consumption:** Achieving high-quality lives with less consumption of goods and services and with reduced emissions of wastes and pollutants.

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1. What are environmental sustainability and eco-efficiency of consumption?

Decoupling:

- **Relative Decoupling:** A decrease in resource inputs or waste outputs relative to GDP.
- **Absolute Decoupling:** An absolute decrease in resource inputs or waste outputs, when GDP increases.

Green Growth paradigm aims to achieve "Absolute Decoupling".

Relative Decoupling is misleading

Why?

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1. What are environmental sustainability and eco-efficiency of consumption?

Growth can be achieved by:

- Technology progress
- Increase in inputs of material, labor and capital

Faster growing economies tend to yield greater relative decoupling than slower growing economies, because their technology progress is also faster, but

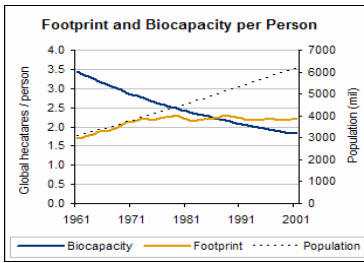
They also tend to use greater resource inputs and produce greater waste outputs.

Therefore, the use of relative decoupling is cautious.

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2. Is the current form of economic growth environmentally sustainable in Asia and the Pacific?

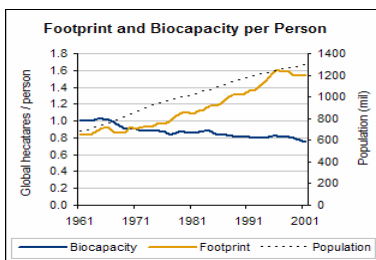
Global Footprint and Biocapacity per person



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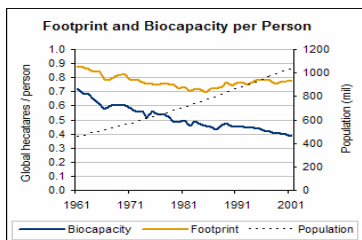
China's Footprint and Biocapacity per person



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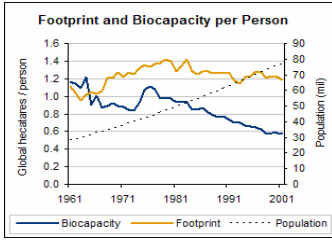
India's Footprint and Biocapacity per person



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2. Is the current form of economic growth environmentally sustainable in Asia and the Pacific?

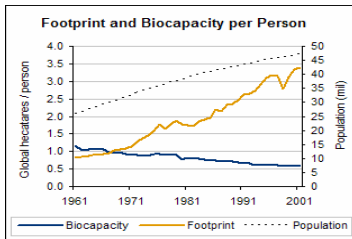
Philippines's Footprint and Biocapacity per person



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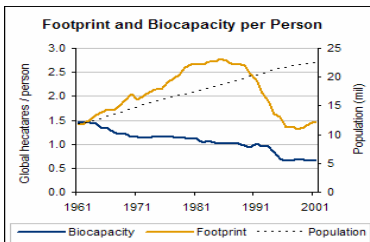
Republic of Korea's Footprint and Biocapacity per person



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2. Is the current form of economic growth environmentally sustainable in Asia and the Pacific?

DPR Korea's Footprint and Biocapacity per person



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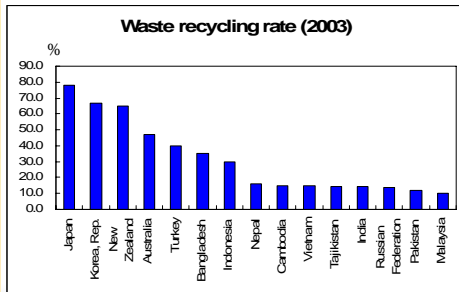
2. Is the current form of economic growth environmentally sustainable in Asia and the Pacific?

Answers

- We no longer live within the ecological limits of the earth.
- In particular, the Asia-Pacific region has a relatively more limited carrying capacity.
- Data suggests that relative decoupling is evident, but not absolute decoupling.
- This suggests that the region is likely to run higher ecological deficits if it continues the current form of its economic growth.
- i.e., The region's ecosystems which are already suffering from overuse, will be suffering even harder if the region continues down the path of unsustainable exploitation and consumption.

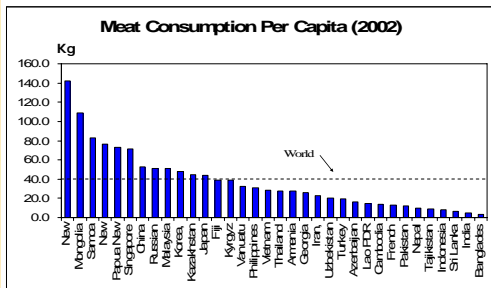
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3. What is the pattern of eco-efficiency of consumption in the Asia-Pacific countries?



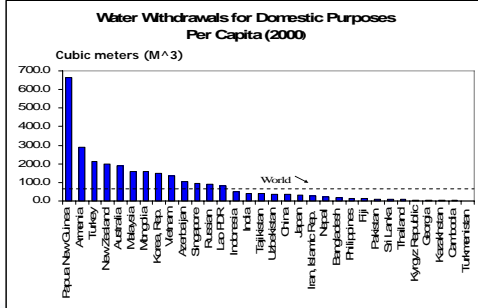
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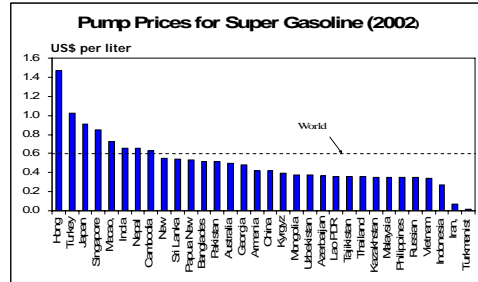
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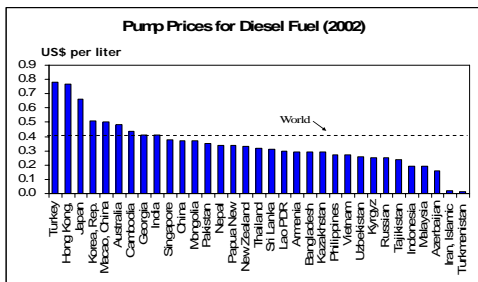
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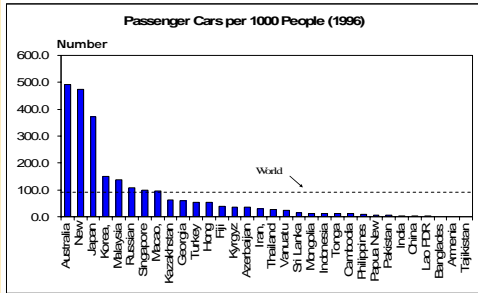
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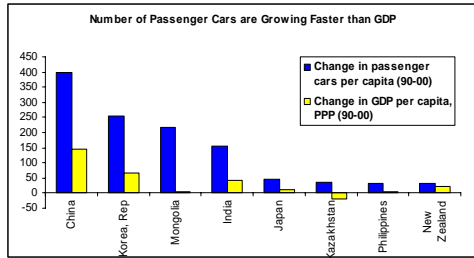
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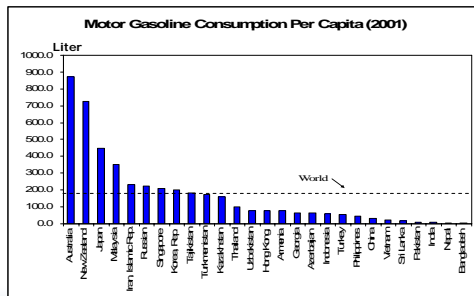
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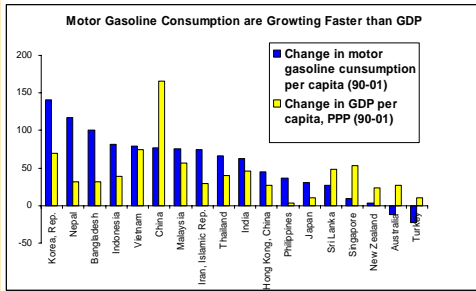
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3. What is the pattern of eco-efficiency of consumption in the Asia-Pacific countries?



slide 32

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3. What is the pattern of eco-efficiency of consumption in the Asia-Pacific countries?

Answers

- There are not many reliable indicators for eco-efficiency of consumption.
- Need to develop more reliable indicators for eco-efficiency of consumption.
- Some countries are doing better than others.
- This implies that there is room for improvement in eco-efficiency of consumption.
- Need to learn from neighbouring countries.
- What else?

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4. What is the empirical relation between eco-efficiency of consumption and income?

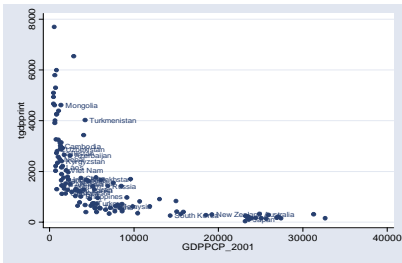
Background

- Will eco-efficiency of consumption improve as income rises?
- One may argue that eco-efficiency of consumption (and production) will eventually improve as the region's economy keeps growing.
- We will examine first the relationship between income and ecological footprints.
- We will then examine the relationship between income and various measures of environmental eco-efficiency of consumption.

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4. What is the empirical relation between eco-efficiency of consumption and income?

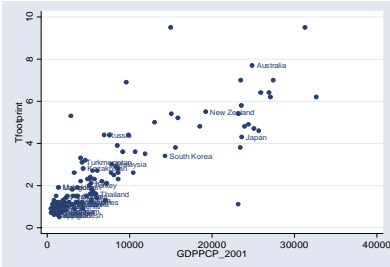
Total Ecological Footprints per US\$ 1 GDP vs GDP per capita



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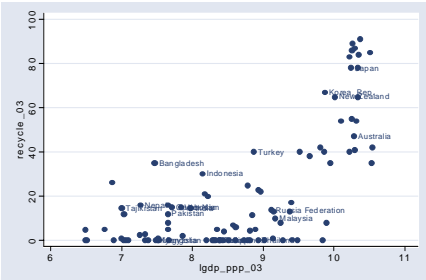
Ecological Footprints per capita vs GDP per capita



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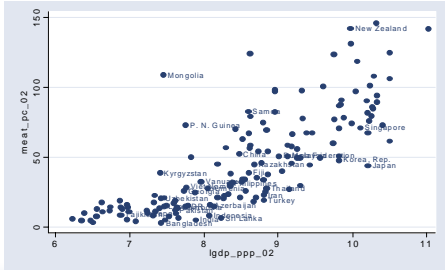
Recycle Rate vs GDP per capita, PPP



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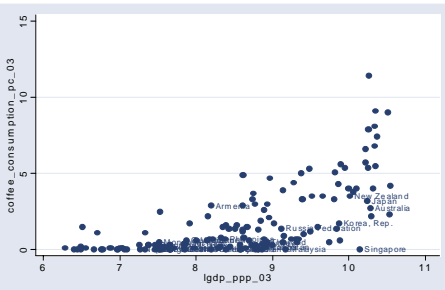
Meat consumption per capita vs GDP per capita, PPP



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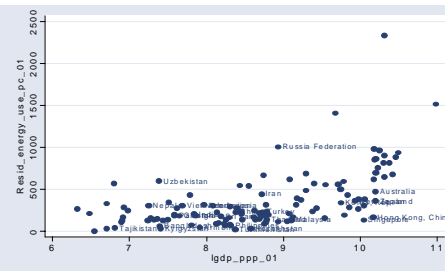
Coffee consumption per capita vs GDP per capita, PPP



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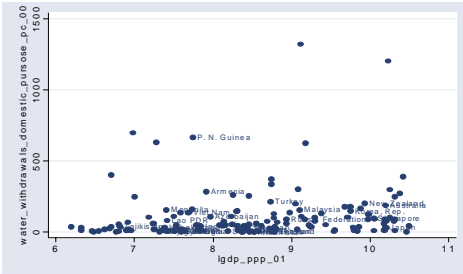
Residential energy use per capita vs GDP per capita, PPP



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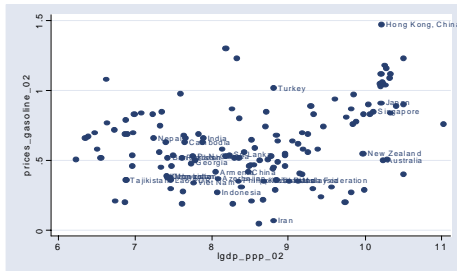
Water for domestic use per capita vs GDP per capita, PPP



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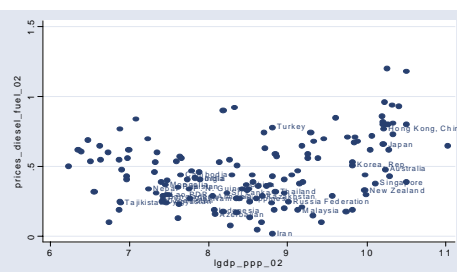
Pump prices for super gasoline vs GDP per capita, PPP



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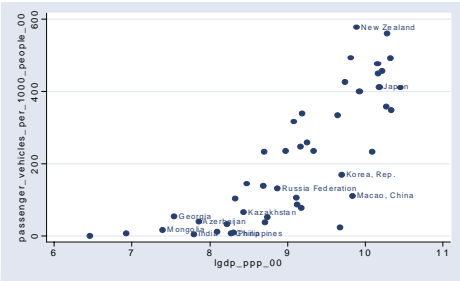
Pump prices for diesel fuel vs GDP per capita, PPP



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4. What is the empirical relation between eco-efficiency of consumption and income?

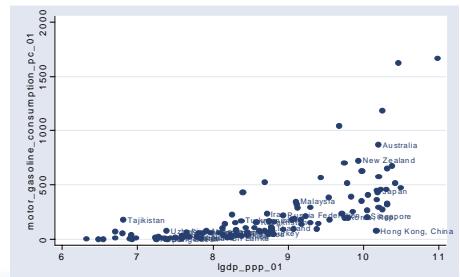
Passenger cars per 1000 people vs GDP per capita, PPP



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4. What is the empirical relation between eco-efficiency of consumption and income?

Motor gasoline consumption per capita vs GDP per capita, PPP



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4. What is the empirical relation between eco-efficiency of consumption and income?

Answers

- Ecological footprints per one unit of GDP may decrease as income rises, but....
- Ecological footprints per person increases as income rises.
- i.e. Relative decoupling from economic growth may be achieved, but absolute decoupling may not be achieved.
- Countries need to change their development paradigm.
- There are many variations among the countries.
- Need to learn from neighbouring countries.

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5. Summary and Policy Implications?

1. To ensure growth environmentally sustainable, environmental pressure should remain within the limit of ecological carrying capacity.
2. Most countries in Asia and the Pacific are now running ecological deficits (i.e., environmental pressure is greater than ecological carrying capacity.)
3. Relative decoupling from economic growth may be achieved, but absolute decoupling may not be achieved, unless the countries change their development paradigm.
4. New Growth Paradigm is needed. What New Growth Paradigm?

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5. Summary and Policy Implications?

5. Countries need to move toward **Green Growth** paradigm which aims to increase both eco-efficiency of production and consumption.
6. To increase eco-efficiency of production, countries need to create more value added with less use of raw materials and energy and with reduced emissions of wastes and pollutants.
7. To increase eco-efficiency of consumption, countries need to achieve high-quality lives with less consumption of goods and services and with reduced emissions of wastes and pollutants.
8. In particular, public policies and active roles of NGO's to promote sustainable consumption patterns are urgently in need.

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Beijing, China

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