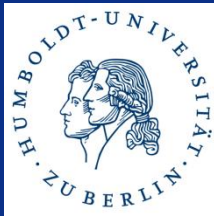


The virtual 'land grabbing' of EU agriculture in a changing international environment



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Outline

1. The changing international environment of EU agriculture

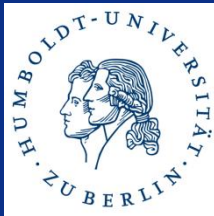
- The end of the Agricultural Treadmill
- Prospects for world food security

2. EU virtual land imports

- Theoretical and methodological framework
- Empirical evidence

3. Conclusions

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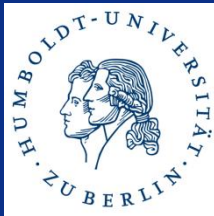
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The end of the Agricultural Treadmill

- The Agricultural Treadmill: 1870-2000.
- Rapid growth of global food demand:
 - Population growth;
 - Growth in per capita food consumption.

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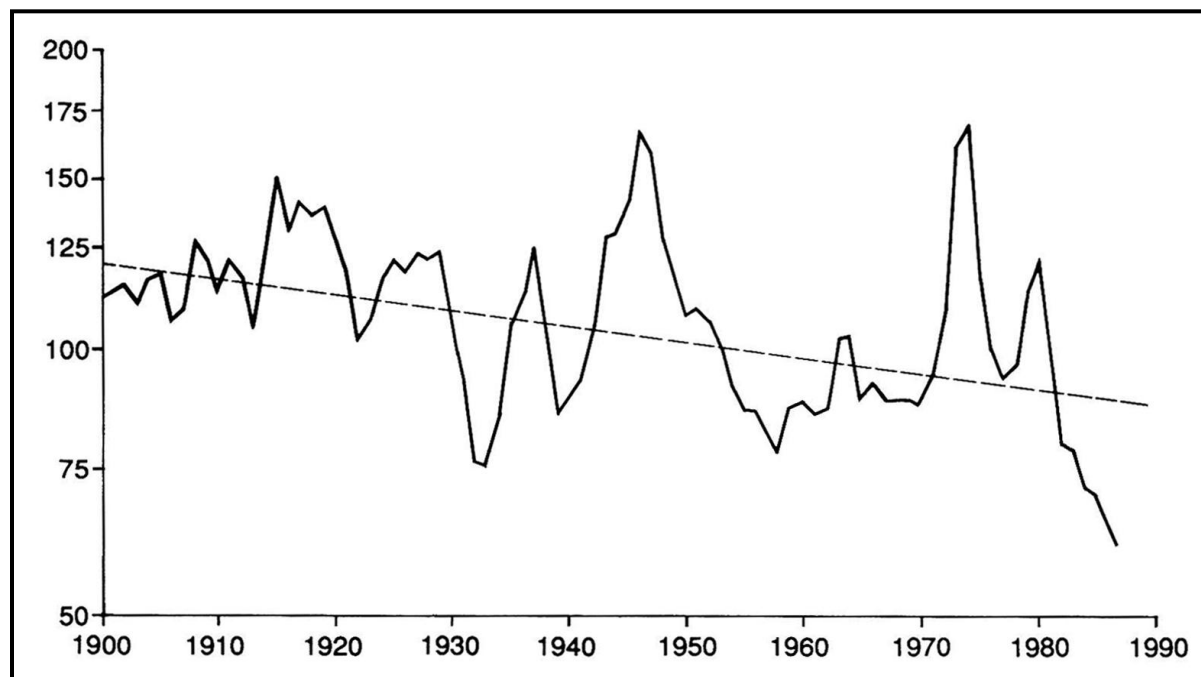
The end of the Agricultural Treadmill

- Even faster growth in global food supply:
 - Expansion of the acreage;
 - Productivity growth.
- Economic consequences:
 - Agricultural income disparity;
 - Declining work force;
 - Negative long-term trend in real food prices.

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The end of the Agricultural Treadmill

Real international food prices, 1900-1990



Source: TYERS and ANDERSON (1992)

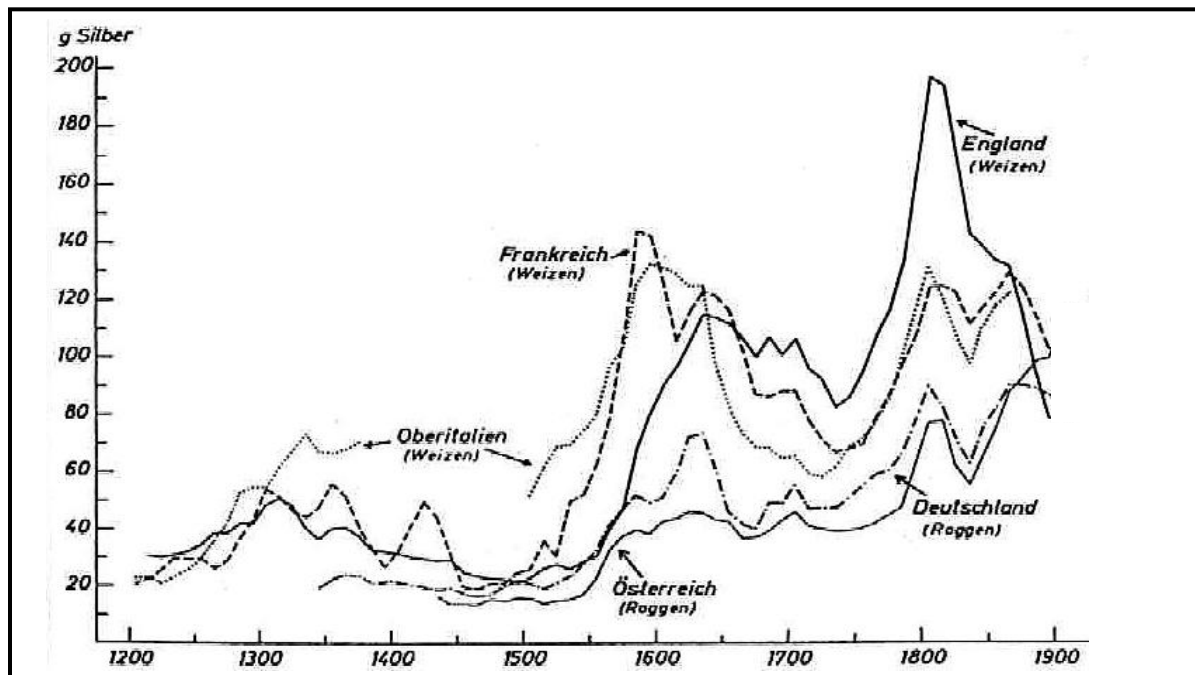
An index of export prices in US\$ for cereals, meals, dairy products and sugar, deflated by the US producer price index (primarily for industrial products), with weights based on the importance of each product in global exports, 1977-79.

Source: Authors calculations based mainly on price series made available by the World Bank's Economic Analysis and Projections Department (see Grilli and Yang 1988)

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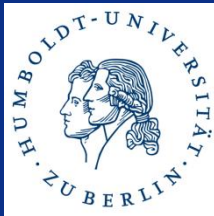
The end of the Agricultural Treadmill

Grain prices in Europe, 1200-1900



Source: ABEL (1978)

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Prospects for world food security

- Continued rapid growth in global food demand:
 - 100 percent between 2000 and 2050;
 - Population growth;
 - Per capita income growth in developing countries.

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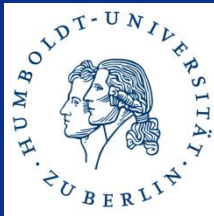
Prospects for world food security

- Limited growth in global food supply:
 - Limited growth in agricultural acreage (arable land: +5 percent between 2000 and 2020)

Region	Change in arable land, 2000-2020 (million ha)
EU-27	4
Russia, Ukraine	13
USA	15
Canada	2
Latin America	45
South Africa	6
Asia, Australia	- 4

Source: Own figure based on VON WITZKE et al. (2008).

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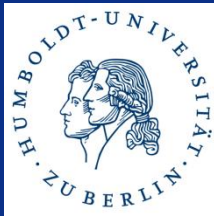
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Prospects for world food security

- Limited growth in global food supply:
 - Production growth predominantly through productivity growth;
 - But: Declining annual productivity growth:
 - 1961-1989: 4 percent;
 - 1990-2000: 2 percent;
 - presently: 1 percent.

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Prospects for world food security

- Additional challenges:
 - Water is becoming ever scarcer and more expensive;
 - Growing demand for natural resource protection as well as for other quality components;
 - Growing bio-energy production;
 - Increasing energy price.

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Prospects for world food security

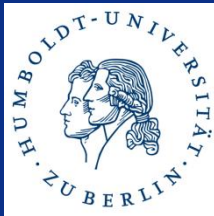
- Climate change and agriculture:
 - Deforestation and grassland conversion are major causes of global warming;
 - Climate effect is higher than of manufacturing and transportation.

Global GHG emissions

Sector	Share (%)
Energy	25
Land use change	18
Agriculture	14
Transport	14
Industry	14
Buildings	8
Other sectors	7
Total	100

Source: von Witzke and Noleppa (2007).

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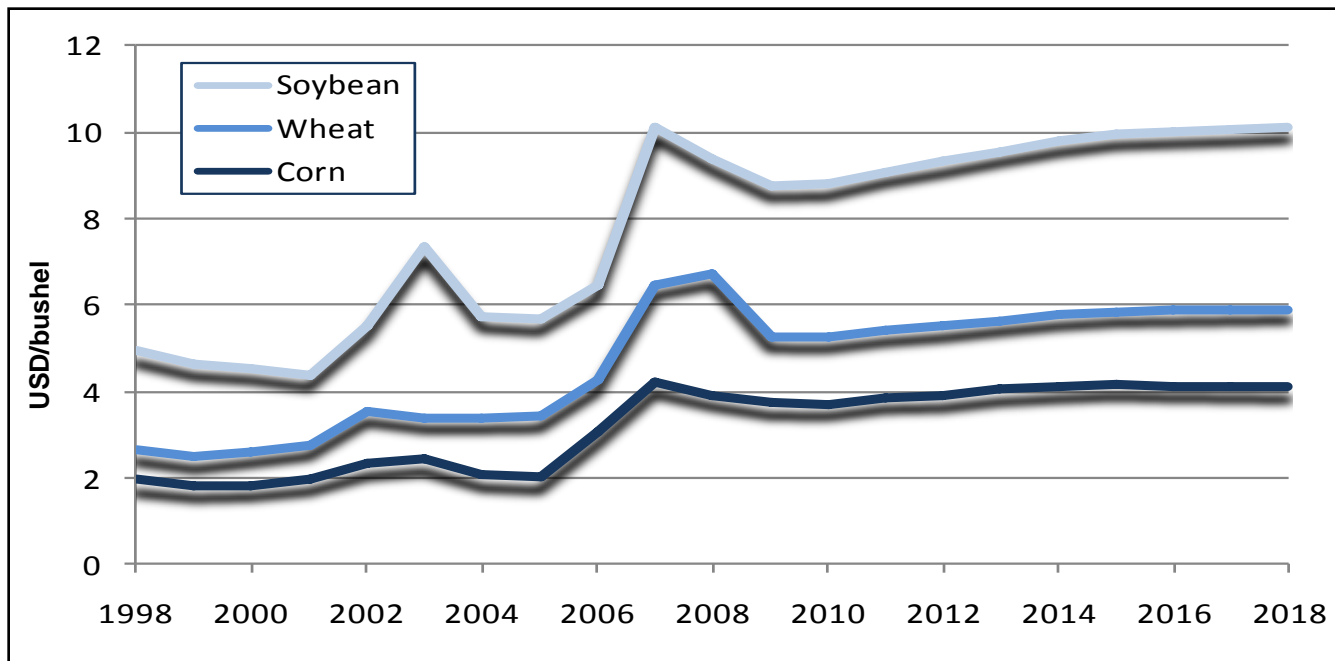
Prospects for world food security

- Economic and political implications:
 - Increasing food prices;
 - Good news:
generate new employment and income opportunities;
 - Bad news:
create additional incentives for deforestation;
contribute to world food security becoming
a significant political issue (civil unrest, migration).

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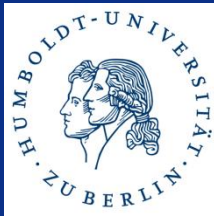
Prospects for world food security

Market prices for agricultural commodities (1998-2018)



Source: Own figure based on FAPRI (2010).

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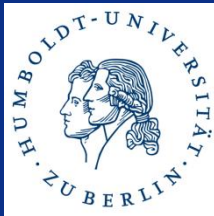
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Prospects for world food security

- UN objective of cutting in half by 2015 the number of malnourished humans in 1995 is out of reach.
- To the contrary:
The number of malnourished people is increasing.

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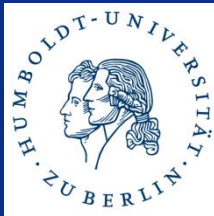
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Prospects for world food security

- Poor countries once were net food exporters.
- Today they are net food importers.
- Food import gap of poor countries is expected to quintuple between 2000 and 2030.
- It can only be closed if rich countries produce and export more (or import less) food!

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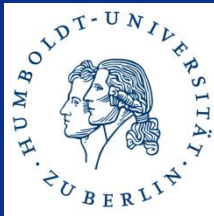
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Theoretical framework: Trade in virtual agricultural land

- Agricultural production requires land.
- When agricultural commodities are traded, the inputs used in their production are traded virtually.
- Concept of virtual input trade developed by ALLAN (1993) for water.

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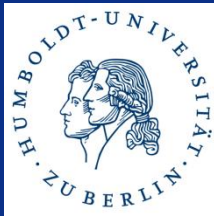
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Theoretical framework: Trade in virtual agricultural land

- Relevance of virtual land trade:
 - Quantification of economic externalities (side effects) and market distortions through expansion of land: loss of natural habitat, green house gas emissions.

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Methodological framework: Coverage of the study

- 240 tradable products are converted into commodities.
- SITC:
 - Food and live animals;
 - Beverages and tobacco;
 - Oilseeds and oleaginous fruits;
 - Cotton and wool;
 - Animal and vegetable oils.
- More than 40 commodities are included for the EU-27 and the time period 1999-2008.

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Empirical evidence

- The EU together with China is the world's leading agricultural (net) importer:
 - EU net imports: 45.5 billion USD
 - China net imports: 44.5 billion USD

Leading agricultural exporters and importers, 2008 (in billion USD)

Exporters		Importers	
Country	Value	Country	Value
United States	134.0	Extra EU-27	173.1
Extra EU-27	127.6	United States	115.9
Brazil	61.4	China	86.8
Canada	54.1	Japan	80.6
China	42.3	Russia	34.3

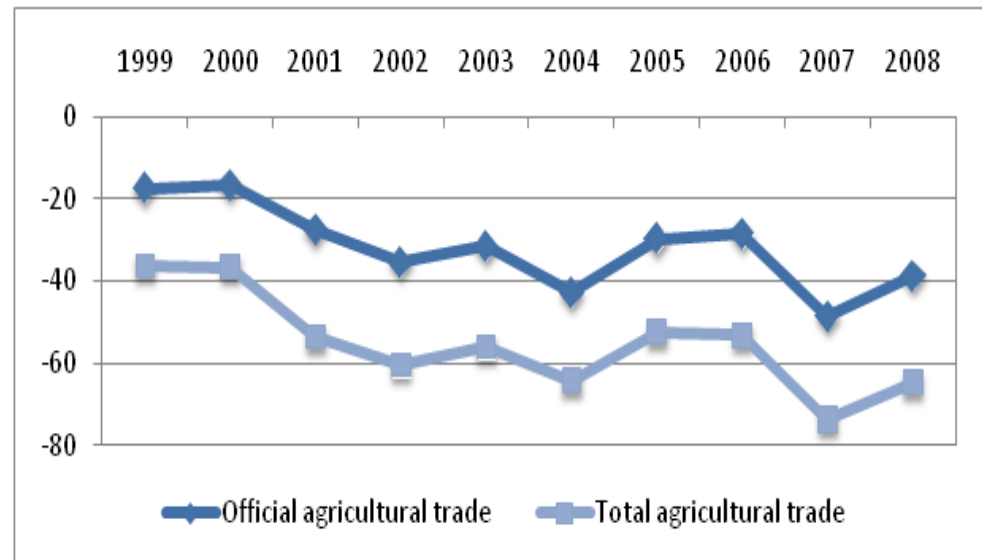
Source: Own figure based on WTO (2009).

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Empirical evidence

- Agricultural exports slightly decreased (-3 million tons)
- Agricultural imports have grown considerably (+25 million tons).
- Net imports have increased significantly.

Net trade quantities, EU-27, 1999-2008 (in million tons)



Source: Own figure based on EUROSTAT (2010).

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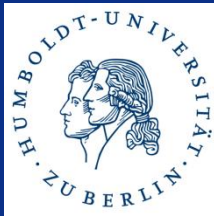
Empirical evidence

Agricultural net trade of the EU-27 for key commodities (in million tons)

	1990/2000	2007/2008	Change
Wheat	9.24	6.67	-2.56
Corn	-1.64	-9.29	-7.66
Other grains	10.55	0.90	-9.65
Vegetable oils	-1.54	-8.03	-6.49
Dairy products	2.30	2.09	-0.20
Sugar	0.76	-4.04	-4.79

Source: Own calculations.

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Empirical evidence

- EU virtual available land net imports have increased between 1999/2000 and 2007/2008:
 - Virtual arable land export: Decline to 14 million ha.
 - Virtual arable land import: Increase to 49 million ha.
 - Virtual arable land net import:
Up by 40 percent or almost 10 million ha.
 - Portugal: 9.2 million ha; Hungary: 9.3 million ha.

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Empirical evidence

- EU virtual arable land net trade by selected crops 2007/2008 (in million ha):

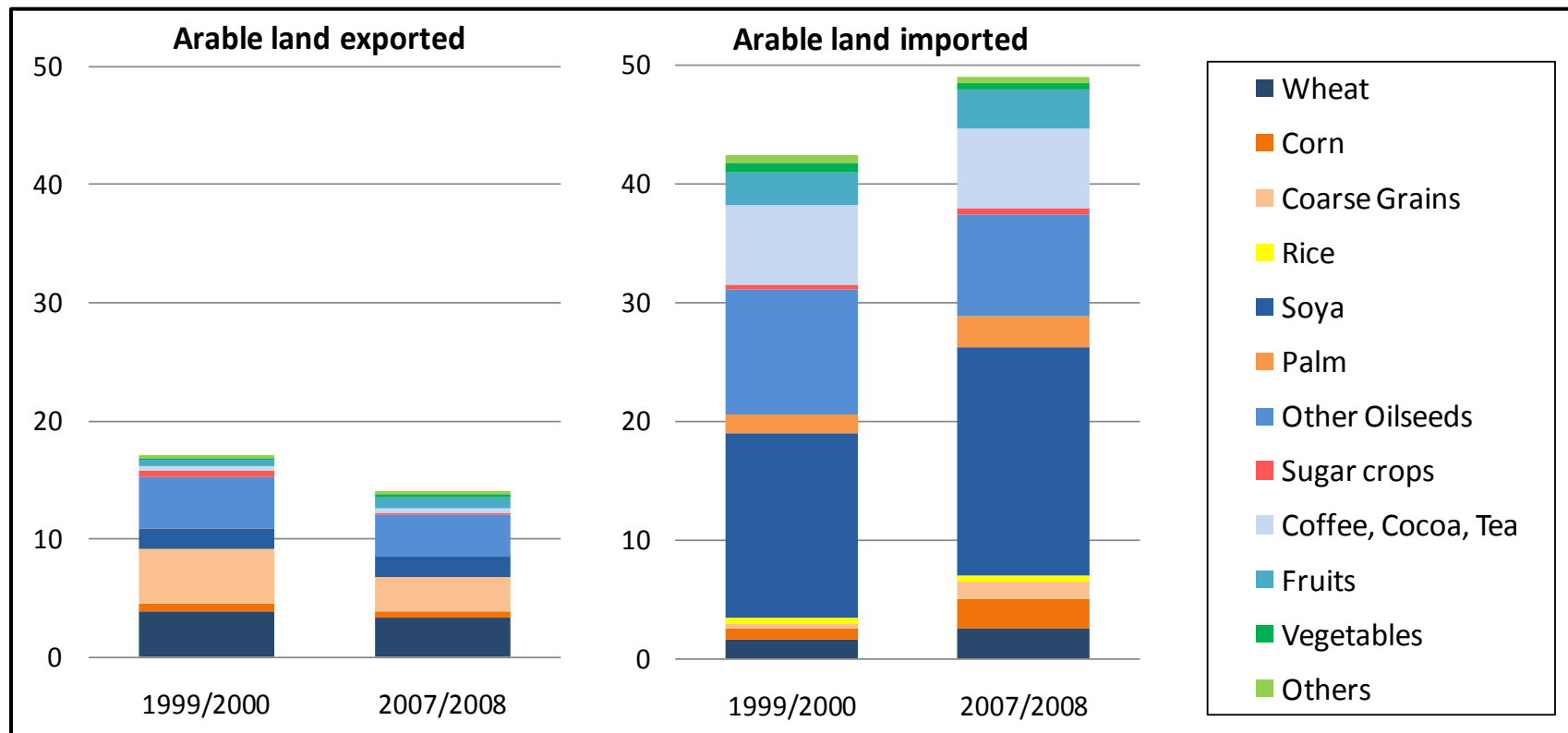
- In total, 34.9 million ha were virtually net imported.
- German territory: 35.7 million ha.

Soybeans	-17.53
Other oilseeds	-7.68
Coffee, cocoa, tea	-6.28
Fruits	-2.36
Corn	-1.92
...	
Wheat, coarse grains	2.23

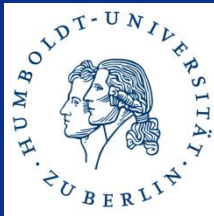
Source: Own calculations.

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Empirical evidence: Summary on EU arable land trade



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Empirical evidence: Technology and policy scenarios

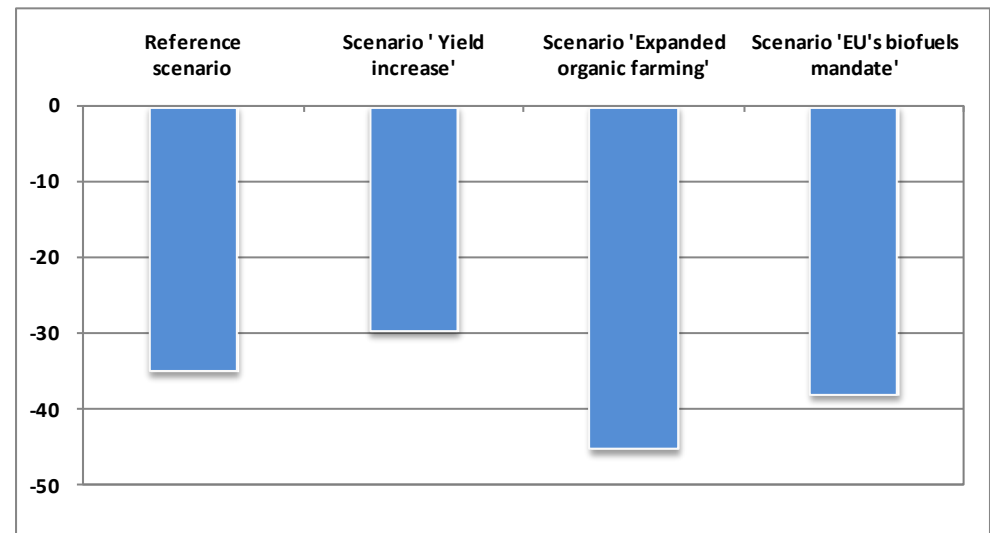
- Scenario 'productivity growth':
Increased annual yield growth of about 0.3 percentage points per year.
- Scenario 'Expanded organic farming':
Organic farming on 20 percent of land.
- Scenario 'EU's biofuels mandate':
10 percent renewable energy.

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Empirical evidence: Results for the three scenarios

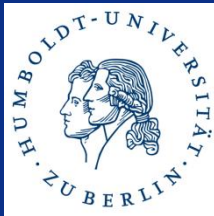
- Higher yields decrease land imports (-5.3 million ha)
- Organic farming (+10.2 million ha) and also biofuels (+3.2 million ha) increase land imports

Net land imports of the EU under changing technologies and policies (in million ha)



Source: Own calculations.

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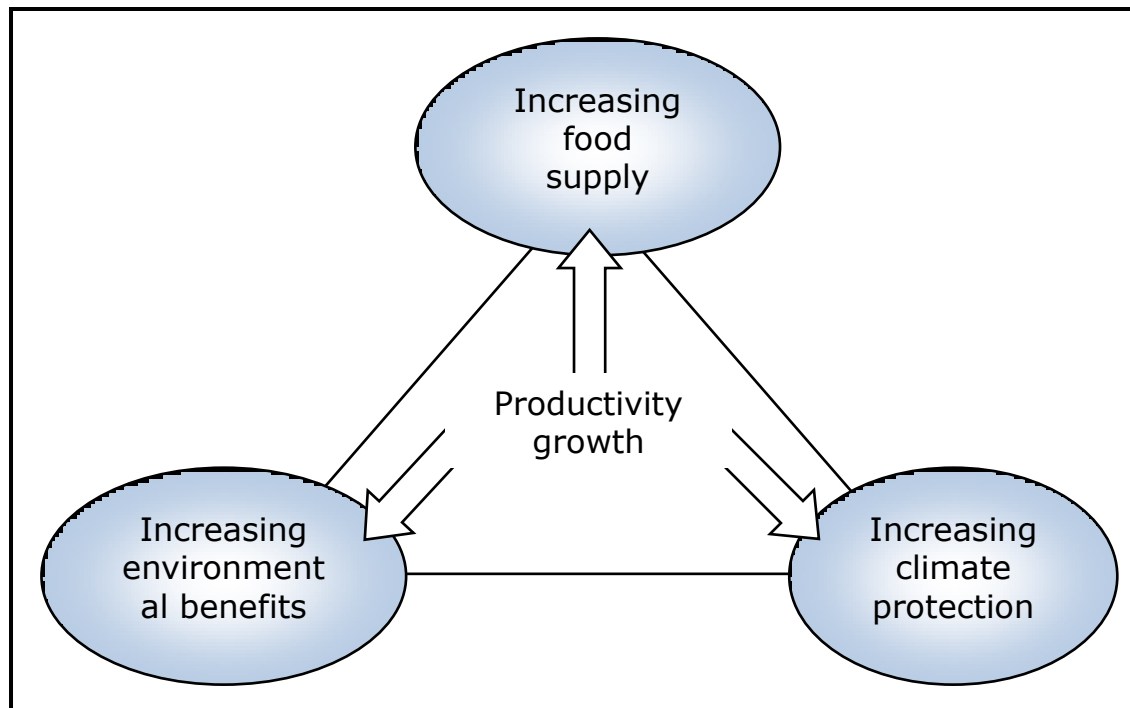
Conclusions

- Productivity growth is the key for agricultural growth.
- Productivity growth is also the key in the fight
 - against hunger and malnutrition,
 - against global warming, and
 - for the preservation of natural habitats.

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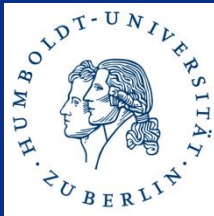
Conclusions

The 'golden' triangle of productivity growth



Source: Own figure.

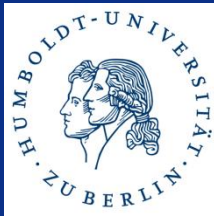
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Conclusions

- EU and world productivity growth have declined.
- EU agricultural net imports have increased.
- EU is the largest agricultural net importer (tied with China).
- EU is a large and increasing net importer of agricultural land.
- Reduction in EU virtual land imports requires productivity growth.

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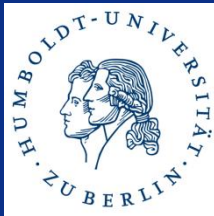
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Conclusions

- Source of productivity growth in EU agriculture:
Technological progress!
- Source of new technologies:
Investment in agricultural research!
- Around the globe:
Agricultural research (both, public and private)
socially very profitable!

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