



VYTAUTAS MAGNUS  
UNIVERSITY  
MCMXXII

*Sustainability of catching-up growth in the extended European Union*  
*Romualdas Juknys and Genovaitė Liobikienė, Rio+20*

# *Sustainability of catching-up growth in the extended European Union*

*Romualdas Juknys and Genovaitė Liobikienė*

*Vytautas Magnus University  
Lithuania*

*GRF on Sustainable Consumption and Production  
Rio de Janeiro, 2012*



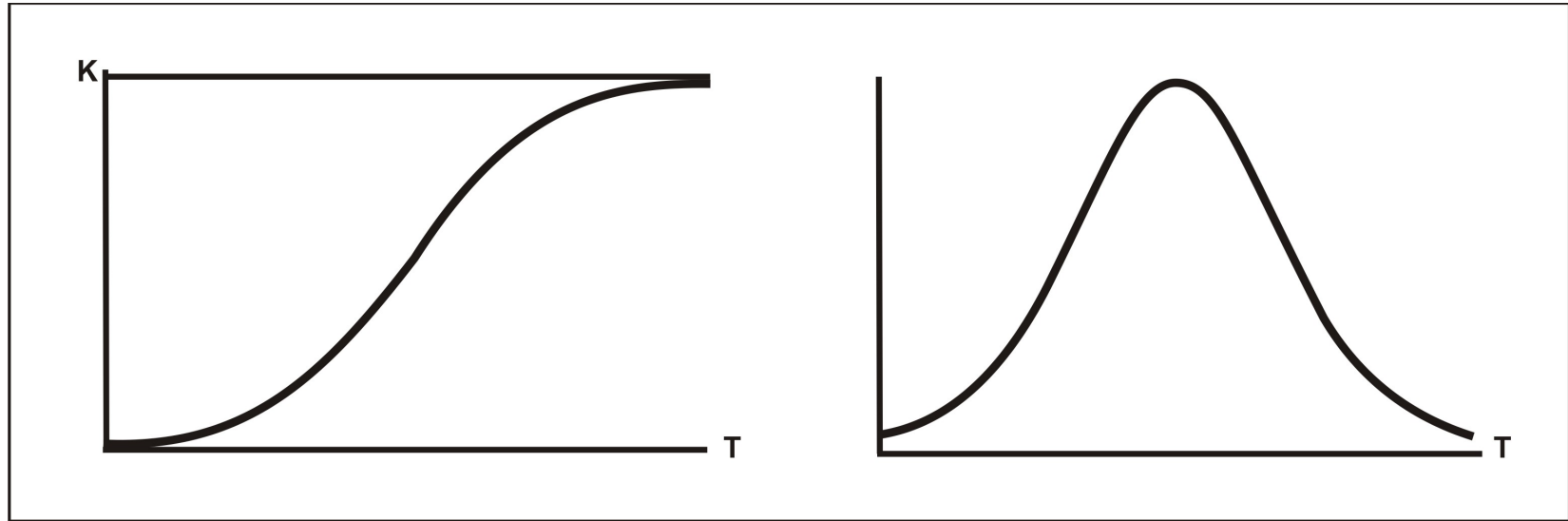
***The main aim of study - to analyze a compatibility of an economic growth with the sustainability concept.***

***Three closely interrelated topics are briefly presented:***

- general regularities of growth;***
- specific features in the development of new EU member states from the former Soviet block;***
- green decelerating growth versus radical de-growth (Evolution versus Revolution).***



## *Logistic curve as an universal model of growth*

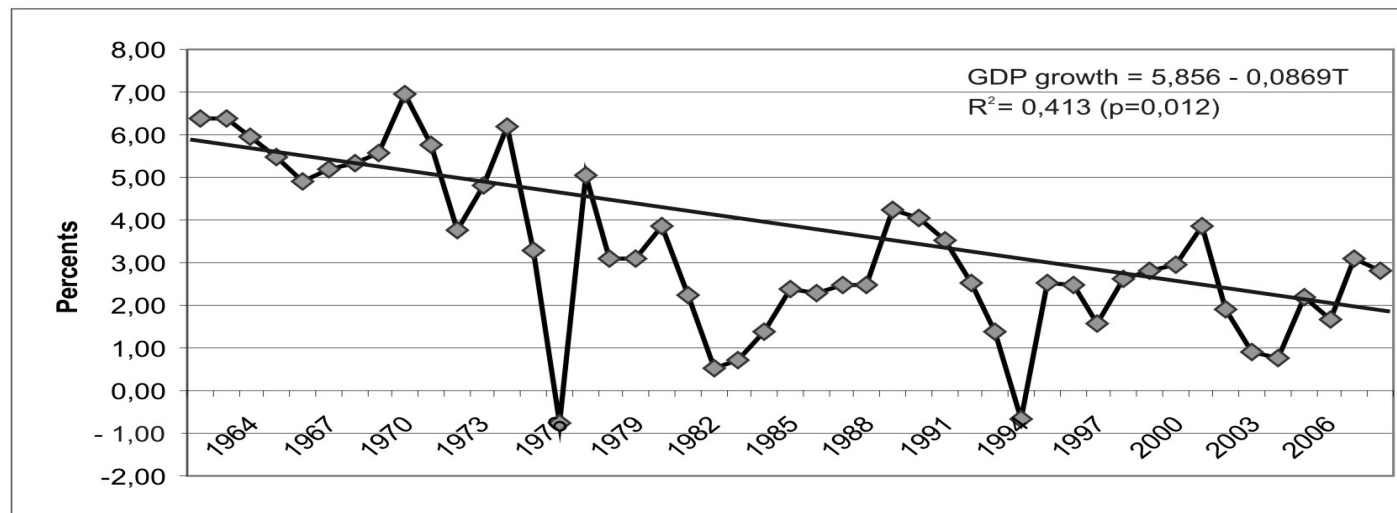


- *A logistic curve is often used to approximate dynamics of natural and social systems including economic growth.*
- *The neoclassical growth model (R.Sollow) covers the right wing of logistic growth function i.e phase of "mature" economy.*
- *The countries of mature economy undergo a decelerating rate of growth because of diminishing returns and should inevitably reach the phase of steady state ("zero growth").*
- *The technological progress is only able to reduce the rate of economic growth deceleration and delay the phase of "zero growth".*



# **Annual GDP growth in the Euro zone countries**

## **World Bank national accounts data**



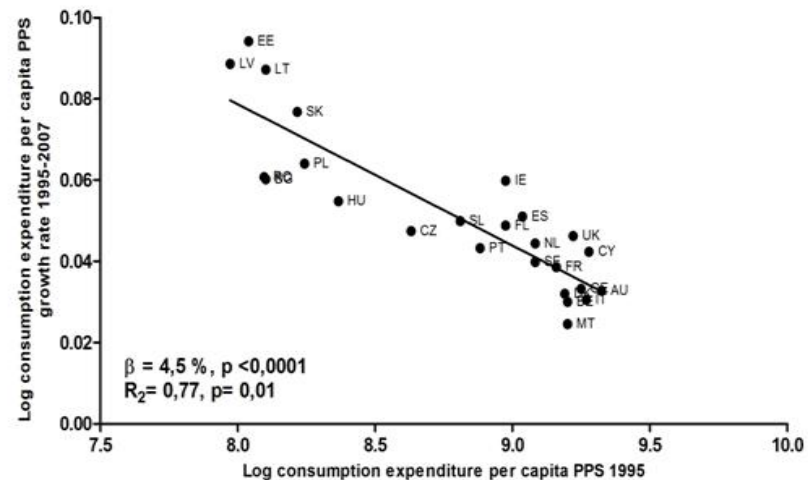
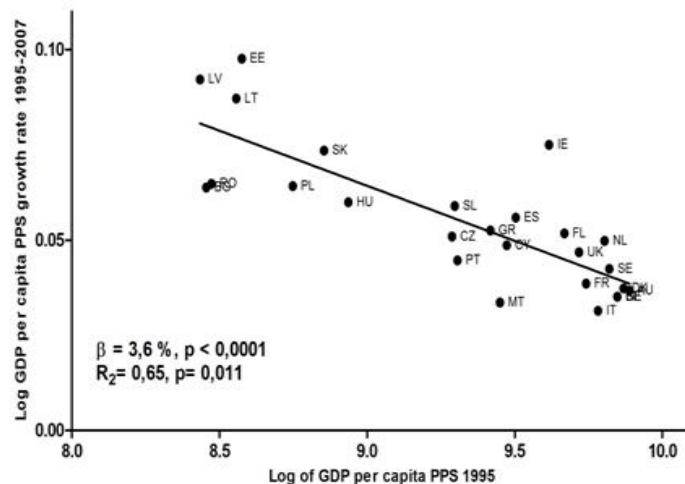
- **Despite of an essential fluctuations, a deceleration trend of economic growth is evident and the **GDP growth rate** has decreased approximately 3 times during the 50 year period.**
- **Similar trends are characteristic for other developed countries as well.**



- **Besides decelerating rate of growth, an other important regularity of economic growth is related to the issues of convergence between poorer and wealthier countries and regions of matured economies.**
- **-The most widely used and best theoretically grounded is beta-convergence approach (Barro and Sala-i-Martin, 1992). which is based on the neoclassical growth model and shows the speed of convergence to a hypothetical steady state i.e. "zero growth" phase (Rapacki and Prochniak, 2009).**
- **- Since according to beta-convergence concept all countries narrow their distance towards the steady state in the same percentage, less developed countries have to cover longer distance and to grow faster (catching –up growth).**
- **- Further investigations have shown that beta-convergence approach can successfully be applied to investigate the trends of different socio-economic and environmental indicators**



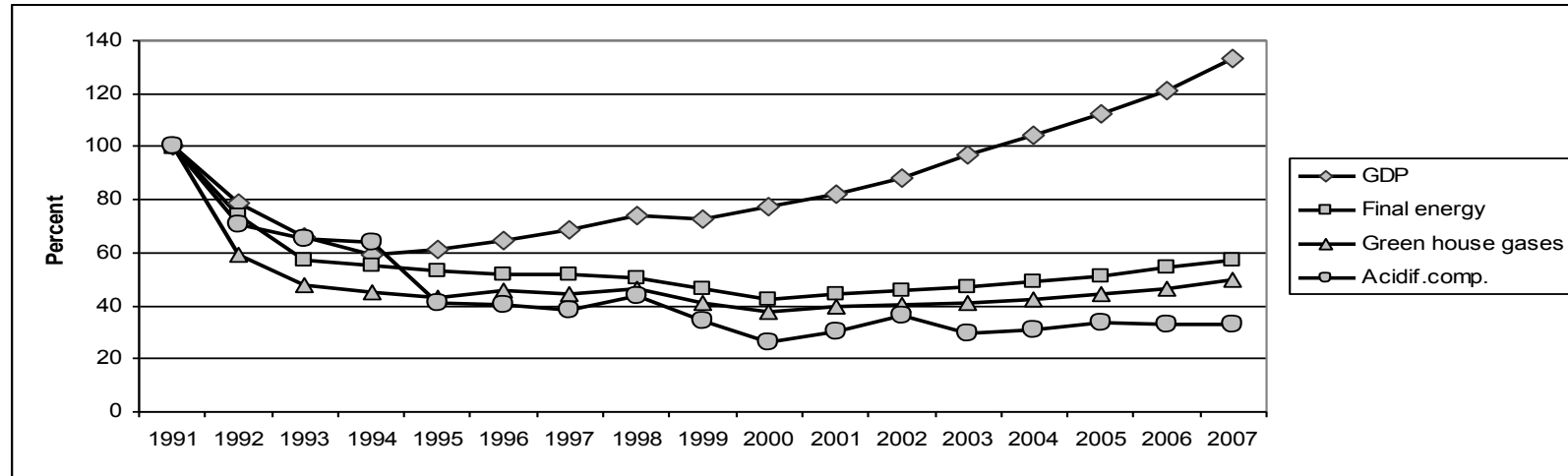
## **Regression of growth rate on initial level of GDP (left) and Consumption expenditure (right) in the extended EU**



- **The lowest initial level and the highest growth rate resulting in the convergence of new and old member states are characteristic of the Baltic states (Estonia, Latvia and Lithuania), followed by other states from the former Soviet block.**
- **For socio-economic indicators the highest rate of convergence in the extended EU is characteristic of prices (5.4%) and the lowest – of GDP and disposable incomes (3.5%).**
- **A high rate of convergence in energy efficiency (5.5%) is a very positive feature of EU integration. Energy efficiency in the EU10 amounted only 56.6% of the EU15 level in 1995 and caught up to 77.5% in 2007.**



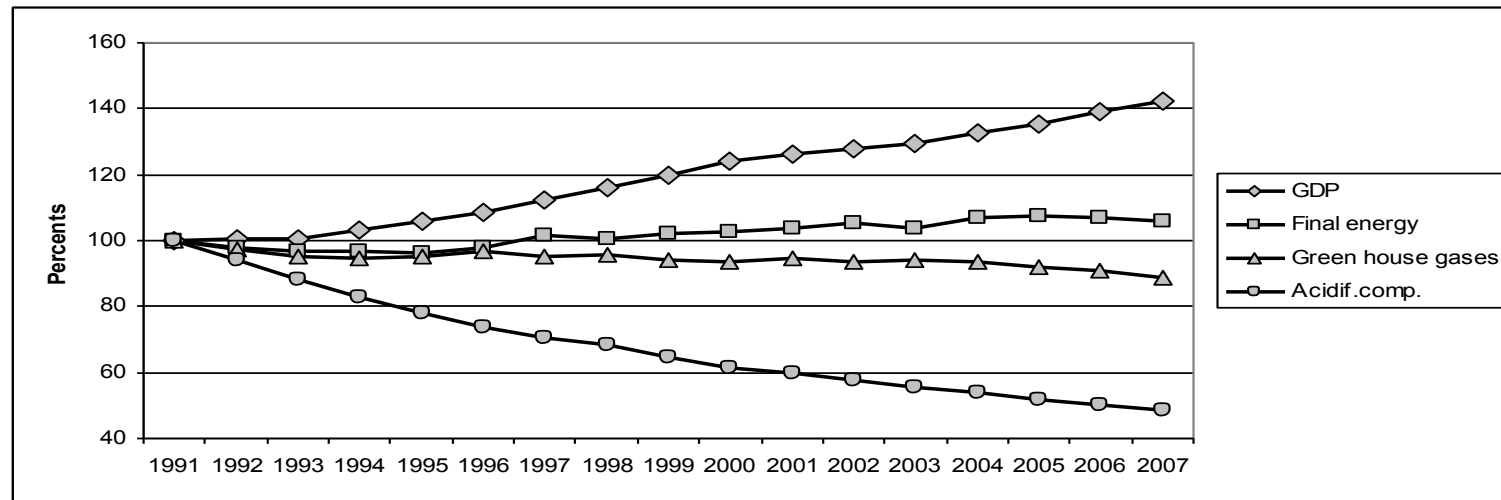
## ***Decoupling of economic growth from environmental impact in Lithuania***



- **Primary decoupling (decoupling of energy consumption from the economic growth) was very strong and absolute decoupling up to the 2000 yr. was achieved. Despite some increase in energy consumption along with very fast economic growth (2001-2007) energy intensity has decreased approximately three times over the period from the reestablishment of independence up to the current economic crisis.**
- **Secondary decoupling (decoupling of environmental pollution from the energy use) was much weaker and pollution intensity (amount of green house gases and pollutants per unit of consumed energy) has decreased by 19 and 29 % over the same period.**
- **In general, along with the 33% increase in GDP (in constant prices), the final energy consumption was reduced by 45%, the emissions of green house gases halved and the emissions of acidifying compounds reduced three times during the period from the reestablishment of independence up to the current economic crisis.**



## ***Decoupling of economic growth from environmental impact in EU-15 countries***



- ***Rather weak primary decoupling is characteristic of EU-15 countries and energy intensity was reduced only by 25% over 1991-2007yr. period. However, no increase in energy consumption (no rebound) was registered over last four years before the current economic crisis.***
- ***Wide implementation of different air pollution mitigation measures resulted in absolute secondary decoupling. The emissions of acidifying compounds per unit of consumed energy were reduced approximately 2.2 times over the 1991-2007 yr. period.***
- ***Absolute, though much less expressed secondary decoupling is characteristic of green-house gases emissions. Amount of green house gases per unit of consumed energy has decrease by 16% during the same period.***





## ***Green decelerating growth versus radical de-growth***

***The financial and economic crisis has highlighted the main weaknesses of debt driven economy and stimulated a search for new ways of development.***

***Two opposite concepts are proposed most often:***

- Greening of current economy (evolution);***
- Radical de-growth (revolution).***

***Greening of economy is mostly oriented to considerable cut in greenhouse gases emissions, enhancement of energy efficiency, replacement of fossil fuels, reduction in air pollution, etc. However, further economic growth is considered as an obligatory component of further development.***

***According to the concept of radical de-growth an essential reduction of consumption and production is absolutely necessary in order to reduce ecological footprint of developed countries and to avoid ecological crisis. Social revolution is considered as the most acceptable possibility to solve complicated recent problems.***

***The main question would be – is it possible to reduce environmental impact (use of natural resources and environmental pollution), without radical reduction of consumption and production and without social revolutions, which usually lead to unpredictable consequences?***



## *The main possibilities to reduce ecological footprint of developed countries*

- *After the current economic crisis will be managed, return to normal track of decelerating economic growth rate could be expected and halving of growth rate should achieved up to the year 2050.*
- *Further increase in resource efficiency is very important and decrease in resource intensity at least by 2-3% annually, is necessary.*
- *Taking into account that materials can be recovered (reused and/or recycled), to achieve 60-70% of materials recovery inside 20-30 years and to reduce the demand for newly extracted materials 2-3 times seems realistic option.*
- *Almost two thirds of ecological footprint in developed countries are related to the use of traditional energy based on burning of fossil fuel. The de-fossilization of energy sector and fundamental acceleration in the use of renewable energy are the most promising options.*
- *The EU plan for a competitive low carbon economy looks very promising. If the ambitious commitment to reduce green house emissions by 80% up to the year 2050 were implemented, it would result in more than two times reduction of ecological footprint.*
- *Proper use of these possibilities would allow to return ecological footprint of developed countries back to their capacity limits and to avoid radical reduction in consumption and production, as well as, social revolutions, which, as a rule, lead to unpredictable and undesirable consequences.*



VYTAUTAS MAGNUS  
UNIVERSITY  
MCMXXII

*Sustainability of catching-up growth in the extended European Union*  
*Romualdas Juknys and Genovaite Liobikiene, Rio+20*

***Thank you for attention!***

[r.juknys@gmf.vdu.lt](mailto:r.juknys@gmf.vdu.lt)

[www.vdu.lt](http://www.vdu.lt)