THE ENVIRONMENTAL KUZNETS CURVE HYPOTHESIS AS THEORETICAL APPROACH IN RENEWABLE ENERGY PROMOTION IN LATVIA

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The Environmental Kuznets Curve (EKC) hypothesis is still a controversial conception of scientific thought which, nevertheless, does not make economic and environmental researchers indifferent. A similarity exists between the EKC hypothesis and the EU sustainable development policy. Latvia as an EU member state has accepted the strategic goals requiring a reduction in the emission of greenhouse gases (GHG). Owing to the base year selected for the Kyoto Protocol, Latvia faces no difficulties in achieving these goals. However, Latvia might face difficulties due to the ambitions goal to increase its consumption of renewable energy, taking into account the synergy of climate change and energy sectors in EU policy. Difficulties can be caused by the financial inability of the demand side and the political indecision to promote the inclusion of costs of negative externalities in the economic system and to sharply increase the proportion of consumption of renewable energy.

Key words: greenhouse gas, economies in transition, household expenditure structure.
JEL: E640, D190, Q280, Q530.

Scientific discussion on the Environmental Kuznets Curve hypothesis

Since the middle of the 20th century, economists were inspired by the Kuznets hypothesis, i.e. with an increase in incomes of population, income inequality rises, but it declines after a certain point is reached, which is graphically illustrated as a U-shaped curve. Economists have tried to prove or deny the hypothesis for 50 years. Yet the logical and hopeful hypothesis is supported by new interpretations from both researchers of human capital and innovations and economists who are interested in studying interaction between environment and economy (Glomm, 1998; Stern, 2004). The Environmental Kuznets Curve, which is known in economics, was a hopeful conception in the 1990s that allowed us to believe that just like with income inequality, environmental deterioration will decrease along with economic growth owing to education of the public and technological innovations. Economic growth would lead the society from the relatively clean agricultural economy through the polluting industrial economy to a clean service economy (Dinda, 2004).

If the Environmental Kuznets Curve proved to be true, it would be a blow to the advocates of Malthusianism, starting with Meadow and his report Limit to Grow in which he warned the society of scarcity of resources and environmental deterioration. If the Environmental Kuznets Curve proved to be true, capitalistic economies would reduce their negative impact on environment themselves. Yet in reality economies incorporate the negative environmental externalities into their systems very slowly; therefore, there are actually no prerequisites for proving the EKC hypothesis. Economic growth is not a cause, but a prerequisite for reducing the negative
environmental impact, thus increasing demand for developing the economic sectors deteriorating environment in poor countries (Mills, 2009).

Elisabetta Magnani says that it can be theoretically assumed that along with an increase in incomes, the demand elasticity for the quality of environment rises; a positive correlation between economic growth and the quality of environment will emerge. Yet empirical studies do not allow us to explicitly state that economic growth is automatically related to GDP and improvements in the quality of environment, pointing that the role of policy makers is significant – it influences consumer behaviours and demand for environmental improvements (Magnani, 2001). Kijima et al present, several logic to explain the EKC relationship in the literature. First, after income reaches a particular level, the willingness to pay for clean environment rises by a greater proportion than income. Second, environmental degradation tends to increase as structure of economy changes from rural to urban or from agricultural to industrial, but it start falling with another structural change from energy intensive industry to services and knowledge-based technology intensive industry. Third, as a wealthy can afford to spend more on R&D, technologies are replaced by upgraded new and cleaner technology, which improves environmental quality eventually. Fourth, the features of the political system or some cultural values play an important role in the implementation of environmental-friendly policies. Such policies are more likely adopted after economy reaches a sufficiently high level (Kijima, 2010). Author agrees with first logic. According to Pigou, externalities (GHG emission) internalise depend on compromising between society and pollutant. Mostly it determines wealth of society and willingness to pay for environmental harm.

The research aim is to analyse the conditions in Latvia to prove the Environmental Kuznets Curve hypothesis, stressing the demand-side aspects. The research tasks are as follows:

- to discuss a theoretical aspects on the evolution of scientific thought regarding the Environmental Kuznets Curve hypothesis;
- to analyse the changes in the emission of greenhouse gases impacted by Latvia’s economic growth;
Changes in the emission of greenhouse gases in Latvia

The European Union has set ambitious goals in its environmental and energy sectors, which resulted in passing the third energy package, comprising a part of the strategy “Europe 2020”. The strategy continues and activates the EU policy; its purpose is to reduce the emission of greenhouse gases by 20% compared to 1990, to increase the proportion of renewable energy in final energy consumption to 20%, and to promote an increase in the efficiency of using energy at least by 20%. The EU spent approximately 5 billion euros of budget funds and employed almost 2000 people in the fields of energy, transport, and environment in 2009 and 2010 (EU General ..., 2010). The integrity and synergy of environmental and energy sectors is one of the cornerstones of EU development policy. It is justified by the large impact of its energy sector on environment. Without reducing the energy sector, it is not possible to substantially decrease its deteriorative impact on environment and to reduce climate change.

The energy policy of the Republic of Latvia was responsive to the EU goals in promoting renewable energy. Latvia undertook to increase the use of renewable energy sources to 40% of its primary energy consumption. An opposite situation exists regarding reducing the emission of greenhouse gases. The Kyoto Protocol’s base year of 1990 was the beginning of the collapse of Soviet industrialisation. The Soviet Union’s industry was very energy and GHG emission intensive. The collapse of industry in Latvia reduced the amount of emissions more than twice as much; in 1995, the emissions accounted for only 47% of the base year amount, and only 38% in the year 2000. The economic recovery, which followed the industrial collapse, led to a slow increase in the amount of GHG emissions.

The energy intensity decreased significantly – by more than 20% in the period 2004–2008 (see Fig. 2). Along with it, the size of Latvia’s GDP increased, and its GDP per capita rose from EUR 4800 in 2004 to EUR 10200 in 2008. The economic growth was the leading factor causing a decrease in the energy intensity. An opposite situation is observed for GHG emissions. In 2007 compared to 2004, the amount of emissions per capita increased by 12% just like in the energy sector. Thus, the proportion of energy sector in the total GHG emissions remained stable, accounting for 73.1% of their total amount.

The situation in Latvia corresponds to the development of economies in transition, i.e. a sharp decrease in GHG emissions is followed by a period of stability, and then it is followed by an increase in GHG emissions (Huang, 2008).

It is forecasted that an increase in energy consumption and a related increase in GHG emissions will correspond to the amount set by the Kyoto Protocol if the so called scenario “with measures” is implemented. Yet it has to be taken into account...
that there are energy deficits in Lithuania and Estonia, which might significantly impact GHG emissions or energy imports from neighbouring countries, depending on the type of energy source for baseload power supply (Streimikiene, 2009).

The Latvian economy is a transitional economy and is not forced to take emergency measures for reducing GHG emissions within the EU emissions trading system owing to the generous allocation of GHG emission quotas for it.

**Changes in the demand side and its impact on reduction possibilities for GHG emissions**

According to Environmental Policy guidelines 2009–2015 the carbon emission reduction can by implement with three measures, reduction energy consumption, rising proportion of renewable energy in final consumption and promoting energy efficiency in production and consumption.

The reductions in GHG emissions do not force Latvia to significantly change energy policy to impact the demand side. Yet changes will be caused by an increase in the use of renewable energy sources, which is a topical part of the common policy of the EU and Latvia. Irrespective of the source of financing for this policy – taxes, duties, or the government budget – it will have unavoidably effect on households as final consumers. Latvia’s policy makers have to balance these two goals with opposite effects. On the one hand, the externalities caused by fossil resources have to be internalised. At the same time, the use of renewable energy sources has to be pro-
moted by partially subsidising them for a short period, thus energy prices will raise and the demand for it will decrease. On the other hand, care has to be taken for households, so that the incorporation of energy externalities does not burden the budget of households too much, which could cause negative externalities in other sectors, for instance, health care in terms of delayed prevention of diseases.

Latvia’s current energy policy tries to stabilize prices of energy as much as possible. The second-lowest taxes on energy in the EU are in Latvia. While the national economy develops, income of the population increase and the proportion of food expenditure in the budget of households decrease, at the same time the household expenditure on housing and energy slightly increased. The largest part of household expenditure on housing consists of bills on energy consumption. If the household consumption patterns in Latvia and the EU-15 states are compared, households in Latvia pay slightly less on housing and energy, but a significantly higher proportion of household income is spent on food. For instance, in Germany, the proportion of food is slightly above 10%, which is significantly less than in Latvia, whereas the household expenditure on housing is significantly above 20%, which is more than in Latvia.

According to the Environmental Kuznets Curve, with the national economy developing, the size of compensations for externalities has to increase. In absolute figures, costs of fossil energy for final consumers have to continuously increase, irrespective of market situations. An increase in costs of energy will change consumer
behaviours and technological development. Figure 4 shows income elasticity of electricity demand to satisfy normal good until 2008, when average income rises slower than electricity demand. This period must be rising energy taxes for fossil resources, but it will be done only in this year. Also electricity prices not to be a serious factor to change energy consumption behaviour.

![Figure 4: Income and price elasticity of electricity demand](image)

Source: Author calculation according to CSB of Latvia data

Conclusions

1. The Environmental Kuznets Curve can be true if a policy of reducing GHG emission is implemented along with economic growth.
2. Statistic shows that, the amount of emissions per capita increased by 12% just like in the energy sector. This increase corresponds to the development trends of economies in transition; an additional effect of reduction in GHG emissions can be...
achieved by raising the energy taxes on fossil fuels, thus increasing the cost of energy resources.

3. Latvia’s policy makers have to balance two goals with opposite effects. On the one hand, the externalities caused by fossil resources have to be internalised. At the same time, the use of renewable energy sources has to be promoted by partially subsidising. On the other hand, the incorporation of energy externalities should not over burden budgets of households. Therefore, with increases in the country’s GDP and the household incomes, too, the rates of taxes on fossil energy have to be raised, thus creating a continuous interest in the efficiency of using energy and in exploiting renewable energy sources.

4. During the economic crisis, Latvia’s government has limited possibilities to significantly increase government support for renewable energy sources and to compensate for the externalities of fossil energy, as these costs have to be covered by households.

References

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Summary

The Environmental Kuznets Curve (EKC) hypothesis is still a controversial conception of scientific thought which, nevertheless, does not make economic and environmental researchers indifferent. No explicit empirical evidence confirming the EKC hypothesis is obtained. At the same time, the EKC is perceived as a sustainable development model. A similarity exists between the EKC hypothesis and the EU sustainable development policy. Latvia as an EU member state has accepted the strategic goals requiring a reduction in the emission of greenhouse gases (GHG). Owing to the base year selected for the Kyoto Protocol, Latvia faces no difficulties in achieving these goals. However, Latvia might face difficulties due to the ambitions goal to increase its consumption of renewable energy, taking into account the synergy of climate change and energy sectors in EU policy. Difficulties can be caused by the financial inability of the demand side and the political indecision to promote the inclusion of costs of negative externalities in the economic system and to sharply increase the proportion of consumption of renewable energy.

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