UNIVERSITY OF NATIONAL AND WORLD ECONOMY
CENTER ON SUSTAINABLE DEVELOPMENT

# SUSTAINABLE DEVELOPMENT

## International Conference

UNWE - Ravda, Bulgaria,
June 10-11, 2011

PUBLISHING COMPLEX
Sofia, 2012

Публикацията съдържа резултати от изследване, финансирано със средства от фонд "НИД на УНСС", Договор № НП-11/2011.



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УНИВЕРСИТЕТ ЗА НАЦИОНАЛНО И СВЕТОВНО СТОПАНСТВО
София, Студентски град "Христо Ботев"

# Contents

# EMPIRICAL ESTIMATES OF SOCIAL DISCOUNT RATE USING SOCIAL RATE OF TIME PREFERENCE APPROACH, AND SOME TENTATIVE/PRELIMINARY FINDINGS FOR BULGARIA

**Atanas P. Atanasov**[1]

As theorized, the Social Rate of Time Preference (SRTP) is the rate at which society is willing to postpone a unit of current consumption in exchange for a greater amount of future consumption. This approach is considered feasible on several grounds: relatively clear theoretical and methodological aspects; attention paid to it by a lot of researchers; simple additive composition of its discount rate and easiness of its calculation; empirical studies and calculations already done; and, last but not least, available information data. There are many unsolved problems within the frames of this approach too. Some of them researchers are unwilling to deal with, as is the case with the research on elasticity of the marginal utility of consumption, but as a whole, by now this approach seems to be more exploited than others. The Social Rate of Time Preference (SRTP) is based on the argument that public projects crowd out current consumption, and so cost flows and benefit flows which are discounted are in their essence flows of consumption goods either postponed or acquired.

Without going well back into history, the most valuable formulation of this approach that deserves mentioning can be found in Brent (1993)[2], where there is a comparison between this kind of analysis alternatively done with the unit of *time* and with the unit of *consumption*. Contributions in this field, discussed in Juzhong Zhuang et al. (2007)[3], are Amartya Sen (1961)[4], Marglin (1963a; 1963b)[5], Diamond (1968)[6], Kay (1972)[7] and many others.[8]

## 1. Estimating procedures and estimates within the SRTP approach: preliminary and introductory notes

There are two methods proposed for the empirical estimation of SRTP.

With the *first*, SRTP is being approximated to the *after-tax rate of return of government bonds or other low risk government securities*. The main objection against this method is that individuals may not reveal all their preferences concerning the future on the market, and if they do so their preferences as individuals *separate* from society may not coincide with their preferences as individuals as *part* of society. As argued, for example in Dasgupta and Pearce (1972)[9] (and in many other studies), the observed market returns may reflect myopic behavior (shortsightedness) of private individuals, implying *higher* discount rates, versus the *lower* discount rate of society reflecting collective attitude[10].

The *second* method for empirical estimation of SRTP uses a formula, known as *Ramsey's equation*, after the name of the British mathematical economist Frank P. Ramsey, who has made fundamental path-

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[2] Brent, Robert J. (1993), "Country Estimates of Social Discount Rates Based on Changes in Life Expectancies", *Kyklos*, Vol 46, 1993, Fasc 3, pp. 399-409.

[3] Juzhong Zhuang, Zhihong Liang, Tun Lin, and Franklin De Guzman (May 2007), Theory and Practice in the Choice of Social Discount Rate for Cost-benefit Analysis: A Survey, Asian Development Bank, Economics and Research Department, *ERD Working Paper Series* No. 94.

[4] Sen, A. (1961), "On optimizing the rate of saving", *Economic* Journal 71, pp. 479-496.

[5] Marglin, S. (1963a),"The opportunity cost of public investment", *The Quarterly Journal of Economics* 77(2), pp. 274-289; Marglin, S. (1963b), "The social rate of discount and optimal rate of investment", *The Quarterly Journal of Economics* 77(1), pp. 95-111.

[6] Diamond, P. (1968), "Opportunity cost of public investment: Comment", *The Quarterly Journal of Economics* 84, pp. 682-688.

[7] Kay, J. (1972), "Social Discount rates", *Journal of Public Economics* 1, pp. 359-378.

[8] See Zhuang et al. (2007), p. 4, pp. 26-28.

[9] Dasgupta, A. and D. Pearce (1972), *Cost-Benefit Analysis*, UK: Palgrave Macmillan; cited through Zhuang et al. (2007), p. 4, p. 26.

[10] See Zhuang et al. (2007), p. 4.

breaking contributions in this direction in the late 1920s. Ramsey's SRTP formula is derived from a growth model and is the sum of two components (the letters used to denote the components in this formula basically follow Zhuang et al., 2007, p. 4 etc.). In *Frank P. Ramsey's formula*:

$$SRTP = \rho + \theta.g, \text{ where}$$

- ($\rho$) is the utility discount rate, connected with and representing the *Pure Time Preference, PTP*;
- ($\theta.g$) is the product of two parameters:
  - ($\theta$) is the elasticity of marginal utility of consumption; "marginal utility of consumption" refers to "the percentage change in marginal utility of individuals, corresponding to 1 percent change in consumption" [1]; and
  - ($g$) is the annual rate of growth of consumption per capita (following Ramsey, 1928); ($g$) is used to represent the fact that when individuals expect consumption to grow in the future they will be less inclined to save currently in order to get more in the future, because of the diminishing marginal utility of consumption.

This (Ramsey's) formula has to do with the models of individual behavior and saving, where individuals intertemporally maximize utility or welfare[2].

While using ($g$) is neither theoretically, nor practically difficult, the choice of ($\rho$) [=PTPR] and ($\theta$) [=elasticity of marginal utility of consumption] is difficult.

It is claimed that ($\rho$) consists of 2 components:

- one associated with the *impatience* of the individuals; and
- one associated with the *life risk* or the *extinction of humankind*.

Basically, PTP is subject to great discussion. Some of the researchers associate the first component with Pure Time Preference (PTP); i.e. they *reduce ($\rho$) to PTP*. But the prevailing number suggest that (ρ) consists of *two components*. As is well known, one of the main questions is whether, on ethical grounds, ($\rho$), or PTP, be 0; and the second main question is what should be the measure of risk.

- ($\rho$) = 0 is maintained by many researchers, like E. Kula (1984, 1987, 2004)[3], Cline (1992)[4], Stern (2006)[5].
- Counterargument, exploited in the literature, is provided by Arrow (1995)[6] who states that the assumption ($\rho$) = 0 is totally unrealistic. ($\rho$) > 0 is maintained by OXERA (2002) (between 0 and 0.5%), by Scott (1977, 1989)[7] who suggests that long-run saving behavior in United Kingdom is consistent with a value of this component between 0.3 до 0.5%, and by others[8].

It is accepted that ($\rho$) is in the interval between 1 и 3%[9] .

As far as the second component of ($\rho$) [$\rho$ = PTPR], - i.e. as far as the component for *risk*, - is concerned, it is asserted that there is no discussion that such a component exists; it is discussed *how to meas-*

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[1] Zhuang et al. (2007), p. 4: note 5.

[2] See OXERA (17th December 2002), "A Social Time Preference Rate for Use in Long-Term Discounting", The Office of Deputy Prime Minister, Department for Transport and Department of the Environment, Food and Rural Affairs, OXERA Consulting Ltd, pp. 14-17; p. 14.

[3] Kula, E. (1984), "Derivation of Social Time Preference Rates for the United States and Canada", *The Quarterly Journal of Economics*, November 1984, pp. 873-882; Kula, E. (1987), "Social interest rate for public sector project appraisal in the UK, USA, and Canada", *Project Appraisal* 2, pp. 169-174; Kula, E. (2004), "Estimation of a social rate of interest for India", *Journal of Agricultural Economics* 55(1), pp. 91-99; these sources are cited through Zhuang et al. (2007), p. 4, p. 27.

[4] Cline, W. (1992), *The* Economics *of Global Warming*, Institute for International Economics, Washington, DC; cited through Zhuang et al. (2007), p. 4, p. 26.

[5] Stern, N. (2006), *The Economics of Climate Change: The Stern Review*, Cambridge, UK: Cambridge University Press; cited through Zhuang et al. (2007), p. 4, p. 29.

[6] Arrow, K. (1995), "Intergenerational Equity and the Rate of Discount in Long-Term Social Investment", Paper presented at the IEA World Congress, December, Tunis, Tunisia; cited through Zhuang et al. (2007), p. 5, p. 26.

[7] Scott, M. (1977),"The Test Rate of Discount and Changes in Base Level Income in the United Kingdom", *The Economic Journal* 87(346), pp. 219-241; Scott, M. (1989), *A New View of Economic Growth*, Oxford, UK: Clarendon Press; both cited through Zhuang et al. (2007), p. 4, p. 29.

[8] See in Zhang et al. (2007), p. 6: Table 1, for empirical estimates of utility discount rate including estimates of the component for risk.

[9] See Zhang et al. (2007), p. 4.

*ure* this component. Some suggest *death risk* and the *probability of survival*, using statistic data (average death rates, etc.), as in Kula (1984, 1987, 2004), in Evans and Sezer (2004)[1] and so on. According to others, death risk is not relevant in the derivation of the estimation of Social Time Preference (STP); they claim that *changing life chance of the generations* should be applied (this is maintained mainly by Pearce and Ulph, 1999[2], with respect to the projects in the very long run).

Brent (1993) approximates the *Social Discount Rate (SDR)* with the *rate of growth of life expectancy*. In Emelianov (2007)[3] and Emelianov and Sheluntsova (2007)[4] *the death rate due to the so called external causes* is applied as a measure of *life risk*. The theoretical arguments and suggestions here could be continued[5].

Let me focus on a point of no less importance, related to the estimation of *Social Discount Rates (SDRs) using the SRTP approach*. It concerns the estimation of the elasticity of marginal utility of consumption ($\theta$), before we go on and consider three referent empirical estimations of SDR. As noted in Evans (2006), although we have to be careful or actually we have to doubt whether we operate with the appropriate ρ [=utility discount rate, i.e. PTP] and long-run rate of consumption growth per capita (g), *most problematic remains the value of the elasticity of marginal utility of consumption ($\theta$)*[6]. There are different methods for estimating this parameter but I will not focus on them per se; for a review see for example Evans (2005)[7].

Evans (2006) following contemporary microeconomic modelling points to the closeness of (θ) to 1. He applies alternative calculating procedures, assuming independence of food in consumption, meaning assuming that food enters the utility function of consumption *additively and separably* (if otherwise the procedure is rejected), and finds that the values of (θ) [=the elasticity of marginal utility of consumption] is close to 1.5. No matter what doubts exist concerning the technical accuracy and the *statistical rejection of this assumption*, such estimates are provided, inter alia, by Evans and Sezer (2002)[8], Evans (2004a; 2004b)[9], Kula (2004)[10], Evans, Kula and Sezer (2005)[11], Percoco (2006)[12], and by some studies applying econometric co-integration analysis[13]. This kind of calculation applies Frisch's (1959) formula, equation 64[14]; the legitimacy of this calculation is supported by Fellner (1967)[1].

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[1] Evans, D. and H. Sezer (2004), "Social Discount Rates for Six Major Countries", *Applied Economics Letters* 11, pp. 557-560; cited through Zhuang et al. (2007), p. 5, p. 27.

[2] Pearce, D. and D. Ulph (1999), "A Social Discount Rate for the United Kingdom", in Pearce, D., ed., *Environmental Economics: Essays in Ecological Economics and Sustainable Development*, Cheltenham: Edward Elgar Publishing; cited through Zhuang et al. (2007), p. 5, p. 28.

[3] Емельянов, А. М. (2007), "Оценка значения социальной ставки дисконтирования для России и приведение межстрановых сравнений", *Журнал "Финансы и кредит"*, № 46, 2007; see p. 10.

[4] Емельянов, А. М. и М. А. Шелунцова (2007), "Использование подхода ставки межвременных предпочтений для оценки социальной ставки дисконтирования", *Журнал "Корпоративные финансы"*, № 1, 2007, с. 9-21; see p. 13: formula 7.

[5] On the problems discussed so far see, among others, Evans, David J. (Oct. 2006), "Social Discount Rates for the European Union", Milan European Economy Workshops, *Working Paper* n. 2006-20, http://www.economia.unimi.it/uploads/wp/EVANS-2006_20.pdf, pp. 1-5 and the following pages.

[6] See Evans, David J. (Oct. 2006), "Social Discount Rates for the European Union", p. 12.

[7] Evans, D. (2005), "The Elasticity of Marginal Utility of Consumption: Estimates for 20 OECD Countries", *Fiscal Studies* 26(2), pp. 197-224; cited through Zhuang et al. (2007), p. 5, p. 27.

[8] Evans, D. and H. Sezer (2002), "A time preference measure of the social discount rate for the UK", *Applied Economics*, 34, pp. 1925-1934; cited through Evans, D. (2006), p. 8, p. 13.

[9] Evans, D. (2004a), "The elevated status of the elasticity of marginal utility of consumption", *Applied Economics Letters*, 11, pp. 443-447; Evans, D. (2004b), "A social discount rate for France", *Applied Economics Letters*, 11, pp. 803-808; both cited through Evans, D. (2006), p. 8, p. 13.

[10] Kula, E. (2004), "Estimation of social rate of interest for India", *Journal of Agricultural Economics*, 55(1), pp. 91-99; cited through Evans, D. (2006), p. 8, p. 14.

[11] Evans, D., E. Kula, and H. Sezer (2005), "Regional welfare weights for the UK: England, Scotland, Wales and Northern Ireland", *Regional Studies*, 39, pp. 923-937; cited through Evans, D. (2006), p. 8, p. 13.

[12] Percoco, M. (2006), "A social discount rate for Italy", *Applied Economics Letters*, forthcoming; цит. по Evans, D. (2006), p. 8, p. 14.

[13] See Evans, David J (Oct. 2006) "Social Discount Rates for the European Union", p. 8.

[14] Frisch, R. (1959), "A complete system for computing all direct and cross demand elasticity in a model with many sectors", *Econometrica*, 27, pp. 177-196; cited through Evans, D. (2006), p. 8, p. 13.

The equation for the estimation of the *elasticity of the marginal utility of consumption*, or - in our notation- $\theta$, is:

$$\theta = (1 - w.Y)/Y/P, \text{ where}$$

- w is an adjustment for the budget share of food;
- Y is the income elasticity of demand for food;
- P is the compensated own-price elasticity of demand for food[2].

This approach, let me mention again, implies 'preference independence' in that food enters the consumer's utility function as an additively separable element, an assumption *opposed* by Stern (1977), Deaton and Muellbauer (1980), and others. As Evans (2006) states: "If preference independence is rejected, then [the above equation] does not apply and [elasticity of marginal utility of consumption] cannot be sensibly measured"[3]. The findings also show wide confidence intervals for this parameter[4].

A similar procedure – using relative price elasticity of food consumption with respect to non-food consumption, and using income elasticity of food consumption, following Kula (2004) [his research on India], is applied by Sheluntsova (2009). She mentions the assumption for the *complementarity restriction* between food and non-food. This is Kula's (2004) approach, with his well-known method of elasticity calculation, where he assumes that food and non-food are considered to be complementary with a homogeneity restriction.

Sheluntsova (2009) uses the formula:

$$e = b*( y/p^{*}), \text{ where}$$

- $e$ is the elasticity of marginal utility of consumption;
- $b$ is the average propensity to spend money on non-food;
- $p^{*}$ is the relative price elasticity of food relative to all other goods;
- $y$ is the income elasticity of food consumption.

Following Kula's (2004):

$$S = a(Y)^{y}( P_1/P_2 )^{p^{*}},$$

where

- $S$ is the spending on food per capita;
- $a$ is a constant;
- $Y$ is the per capita income;
- $P_1$ is the price of food;
- $P_2$ is the price of non-food; and
- $p^{*}$ is the relative price elasticity for food (relative to non-food).

The specification is easily estimated in logarithms, giving direct estimates of the elasticity parameters (coefficients $y$ и $p^{*}$ in front of the logarithms):

The resulting formula for determining elasticity is:

$Ln(S) = ln(a) + yln(Y) + p^{*}ln( P_1/P_2 ) + \varepsilon$, and is estimated with the method of least squares to find unknown parameters (y) and ($p^{*}$).

The value of ($b$) is calculated using actual data and is substituted in the formula: $e = b*(y/p^{*})$, in order to finally (numerically) derive the elasticity of marginal utility of consumption.

Sheluntsova (2009) applies a formula, which is more general than the well-known Frank P. Ramsey's formula, though reducible to it; her formula is:

$$SRTP = (1 + g)^{\mu}(1 + \delta) - 1,$$

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[1] Fellner W. (1967), "Operational utility: the theoretical background and a measurement", in *Ten Economic Studies in the Tradition of Irving Fisher*, (Ed.) Fellner, W., John Wiley and Sons, New York, pp. 39-75; cited through Evans, D. (2006), p. 8, p. 13. The assertion is in Evans (2006), p. 8.

[2] See Evans (2006), p. 8.

[3] Evans, David J. (Oct. 2006), p. 8.

[4] Ibid., p. 9.

where

- *SRTP* is the social rate of time preference;
- *g* is the rate of growth of consumption;
- $\mu$ is the elasticity of marginal utility of consumption] (we apply the Greek letter (θ); $\mu$ [= θ] is estimated according to the abovementioned formula for θ, θ = (1 – w.Y)/Y/P;
- $\delta$ is (according to Sheluntsova, 2009, p. 717) an individual discount rate (in our notation, $\rho$).

She, and Emelianov too, following Pearce and Ulph (1995)[1], are using

$$SRTP = \delta + \mu.g,$$

where

- $\delta = PTPR + L$,

*where*

- *PTPR* [the Pure Time Preference Rate] *is zero* (which means intergenerational equality);
- and *L* is *the rate of life chances,* estimated as *an average death rate.*

Or: $SRTP = PTPR + L + \mu.g$.

In Emelianov and Sheluntsova (2007), another formula for calculating elasticity of the marginal public utility is applied, based on Stern (1977) and Pearce and Ulph (1995). Suggesting that income grows in time, Stern, using analysis of saving, defines an intertemporal utility function, which leads to a formula for the calculation of the elasticity of marginal utility of consumption.

Emelianov and Sheluntsova's (2007) estimating formula, according to Emelianov and Sheluntsova (2007, p. 13), is as follows:

$$\mu = [APC- \delta]/[APS(APC-y)+y)],$$

where

- $\mu$ [=this is our θ] stands for *the elasticity of marginal utility of consumption*;
- $\delta$ is the rate of Pure Time Preference;
- APC is for Alternative Price of Capital;
- y is the rate of growth of wage income;
- APS is for the Average Rate of Saving.

Evans (2006) gives evidence for wide confidence intervals when estimating elasticity of marginal utility of consumption[2]. Zhuang et al. (2007) note that these empirical results are very sensitive to "the specification of the model, the level of data aggregation, the choice of the estimator, the sample size, and the sample period"[3], and find that the estimate of (θ) is in the interval between 1 and 2[4]. According to Evans (2006), value of (θ) which is close to 1 is appropriate[5].

It should be noted that in estimating SDR on the basis of the SRTP approach, *arbitrary averaged parameter values* are used very often. For example, in Zhuang et al. (2007), following Evans and Sezer (2004), as such values are taken: ρ = 1.5%; θ = 1.3; and (g) - the average rate of consumption growth per capita, is approximated by the average annual rate of growth of Gross Domestic Product per capita, using world statistic data. Evans (2006) accepts as appropriate for finding SRTP the following values of the components: ρ = 1%; θ = 1; g = 2%; so according to him the estimation of public projects in the European Union should use a rate of 3%[6].

[1] Pearce, David and Ulph, David (1995), A Social Discount Rate for the United Kingdom, *SCERGE Working Paper* 95-01, Centre for Social and Economic Research on the Global Environment, University of East Anglia, UK.

[2] See Evans (2006), p. 9.

[3] See Zhuang et al. (2007), pp. 5-6.

[4] See Zhuang et al. (2007), p. 5; see p. 7: Table 2 "Empirical estimates of the elasticity of marginal utility of consumption".

[5] See Evans (2006), p. 11.

[6] See ibid.

## 2. Three referent empirical estimations of SDR, and the corresponding country estimates for Bulgaria

### 2.1. Estimates of SDRs using Brent's (1993) approach

Brent (1993) claims, that "the appropriate SDR is based on the rate of change of life expectancy"[1]. He refers to Eckstein (1961), who gives "one of the first derivations" of the formula, according to which: CRI [=Consumption Rate of Interest, or Alternative Return of Consumption] = PTPR + g.[2] PTPR in Eckstein's work is based on the fact that individuals may not survive in the future; in Brent's construction this aspect is automatically imbedded through the operative use of *life expectancy*. According to Brent, if the dimension of the analysis is *consumption*, then (*g*), *the rate of consumption growth*, should be used; but if, instead, the dimension is *time* – then *life expectancy should be used*. Brent (1993) defines SDR in the context in this *second dimension* and therefore refers to this rate as "Life Expectancy Discount Rate" (*LEDR*). The definition of LEDR is: *rate of decrease of the value of life expectancy in time*. This derivation of SDR takes into account the *inequality aversion* of society with respect to *life expectancy of the different generations*. Brent calls this version of SDR "*egalitarian*", because inequality aversion means that all generations have equal and common interest and contribution to social welfare in time[3].

Brent (1993) uses annual rate of growth of life expectancy in the period from 1965 through 1989, calculated from smooth exponential increase in life expectancy, and makes, with World Development Report/World Bank (1991) data[4], calculations for three groups of countries – countries with low income; countries with income below middle and middle income; and countries with income above the middle income and with high income (a total of 120 countries). The estimates lie in the interval from 0.0591% for Hungary to1.6258 for Oman[5].

As valuable features of LEDR Brent points out: 1) that LEDR always assumes positive values, i.e. that the measure is more consistent, as an unit today is more valuable than an unit tomorrow; 2) It is usually expected that countries with low income will have high SDRs. LEDR possesses this property, as it is significantly negatively correlated with per capita income. Brent shows it is not the same with CRI, which is positively correlated; 3) Consumption Rate of Interest (CRI) [=Alternative Return of Consumption] and LEDR are uncorrelated (the correlation between them is 0). So, if CRI is subject to distortions due to the use of market prices for the calculation of income per capita in a given country and these distortions vary in time, SDR based on LEDR will have values different from CRI[6].

The estimates of Brent's (1993) empirical analysis are as follows (see in the Applications at the end of this article the *adapted table* after Brent, 1993).

- The countries with low per capita income are characterized by high values of LEDR, with the exception of Uganda (0.263)[7];
- The countries with middle per capita income have relatively high, and some of them – very high, values of LEDR, with the exception of *Bulgaria (0.1749)* and Poland (0.1191)[8];
- Among the countries of the third group – with relatively high per capita income, out of 42 countries ahead of Bulgaria are only: Hungary (0.0591); Czechoslovakia (0.01177); Denmark (0.1126); and Ireland (0.1724)[9].

Brent's (1993) model takes into consideration the intergenerational equality.

### 2.2. Estimates of SDRs using the SRTP approach in Emelianov (2007)

A. M. Emelianov (2007) uses the already discussed formula:

$$SRTP = \delta + L + \mu g,$$

where

[1] Brent (1993), p. 399.
[2] See Brent (1993), p. 400.
[3] See Brent (1993), p. 403.
[4] See Brent (1993), p. 404: note 7.
[5] See Brent (1993), p. 403.
[6] See Brent (1993), p. 404.
[7] See ibid., p. 405: Table 1.
[8] See ibid., p. 406: Table 2.
[9] See ibid., p. 407: Table 3.

- $\delta$ is the PTPR;
- $L$ is the level of life risk, measured by the death rate due the so called external causes;
- $\mu$ is the elasticity of marginal utility of consumption - our ($\theta$); and
- $g$ is the rate of growth of consumption per capita of the population.

Using Russian Federation data for the period from 2000 to 2006, the *estimated SRTP* for Russia in this study is 9.9%[1]. And using government bond rate of return data for 2004-2007, and following *Social Opportunity Cost (SOC) approach*, the *SOC estimate* for Russia is 4.5% (the European SOC estimate is 5.7%)[2]. Emelianov finds *Shadow Price of Capital (SPC)*, applying appropriate operative formulae, as follows:

$$SPC = (w\text{-}s.w)/(SRTP+\delta\text{-}s.w),$$

where

- $w$ is the pre-tax rate of return of private capital;
- $\delta$ is the rate of depreciation;
- $s$ is the rate of gross investment;
- SRTP is the already calculated Social Rate of Time Preference[3].

Applying the already mentioned "formula 4" gives a SPC estimate of 0.98, which means that when we invest a unit of capital we receive 0.98 units of consumption[4]. SPC << 1 is interpreted as a sign of reinvesting in the process of investment[5].

Having calculated the SRTP and, now, the SPC, here is the formula used in Emelianov (2007) for the derivation of the Social Discount Rate (SDR) for the economy:

$$SDR = SRTP.SPC.w_i + SRTP.w_c,$$

where

- SDR is for Social Discount Rate;
- SRTP is for Social Rate of Time Preference;
- SPC is for Shadow Price of Capital;
- $w_i$ is the relative share of *investments in capital stock* in the economy; and
- $w_c$ is the relative share of *consumption* in the economy (these relative shares are estimated using official statistic data),

With SPC = 0.89, the calculated SDR is 7%, and with SPC = 0.98, it is 8.4%[6].

Using the World Development Indicators/World Bank data, in Emelianov (2007) are published his SRTP and SDR estimates for the following groups of countries: selected Asian countries; OPEC member countries; Scandinavian countries; G-8 countries, including Russia but excepting the USA; Eastern European countries, including *Bulgaria*; other European countries; other countries in the world. The estimates are for 2006 and are in nominal figures; see in the end of this article the applied diagrams with Emelianov's (2007) results. The comparative analysis shows the following:

- The SDRs for developed countries like France, Italy, Great Britain and others and for some Asian countries are *lower* than the SDRs for the developing countries[7];

[1] See Емельянов, А. М. (2007), "Оценка значения социальной ставки дисконтирования для России и приведение межстрановых сравнений", *Журнал "Финансы и кредит"*, № 46, 2007, с. 10: Таблица 1.

[2] See ibid., с. 10.

[3] See ibid., с. 8: Формула 4. In Emelianov (2007), a second formula for finding Shadow Price of Capital (SPC) is used, applying the Social Rate of Time Preference (SRTP), the Social Opportunity Cost (SOC) and the planning horizon (see ibid., с. 7: Формула 3). As no further multicountry comparison analysis applying different SOCs is appropriate, because of the differences in the exchange courses, the calculation of SDRs applies the SRTP approach and the above mentioned formula 4.

[4] See ibid., с. 12.

[5] See ibid., с. 17.

[6] See ibid., с. 13: Таблица 3.

[7] See ibid., с. 15 ( for SDR estimates for the Scandinavian countries), and с. 16 (for SDR estimates for 7 of 8 countries of G-8).

- The SDRs for the Western European countries calculated directly by using the SRTP approach or indirectly with the SPC approach are in the range of 2 to 4%, a level of social discount rate, according to Emelianov, *recommended* by the World Bank[1];
- For the Eastern European countries, without Poland and Slovenia, but *including Bulgaria*, the SDRs are *relatively low – below 4% in nominal figures*[2]; for *Bulgaria, Estonia and Latvia SDR > SRTP*, and for Czech Republic, Slovak Republic and Poland SDR < SRTP; for Singapore, the Scandinavian countries and for the 7 of the 8 countries of G-8, again, *SDR < SRTP*, but this relation between SDR and SRTP is not subject to further investigation and analysis in the present study.

The calculated SRTP measure of the SDR for *China* in Emelianov (2007) is not higher than 2 % in nominal figures, while the *Weighted Average Cost of Capital (WACC) SDR estimate* for China in many other research studies is substantially higher.

### 2.3. SDR estimates using the SRTP approach, with a component estimate for Relative Risk Aversion (RRA)

A third variant of calculating a SRTP measure of the SDR estimate is proposed in Valentim and Prado (2008)[3]. They note the lack of consensus in the literature on how to discount the social investments, while, at the same time, according to them, the *SRTP approach*, also called *ethical*, compared to the *Social Opportunity Cost (SOC) approach*, also called *prescriptive*, is the most recommended and most widely used. They refer to the contributions of Feldstein (1964, 1965)[4], Spackman (1991, 2004)[5], Pearce and Ulph (1995)[6], OXERA (2002), Evans (2005)[7]. They accept and follow Feldstein's (1965) SRTP methodology and, using the World Development Indicators/World Bank (2007) data, apply an estimating methodology to produce SDR estimates for 167 countries. They take into account the difficulties in the field of SDR estimation, noting that recommending the SRTP approach does not mean achieving unified analytic theory and even quote Feldstein's saying that searching for the perfect formula to specify SRTP is futile[8]. Their attitude towards Cowen's (2008)[9] view of SRTP determination and towards Spackman's (2004)[10] view of the elasticity of marginal utility of income manifests their endeavor to develop and apply Feldstein's conception of SRTP.

Cowen (2008), for example, asserts that the proper discount rate is context-dependent[11]. Focusing on that, they note the application of a *variety of methodologies* for estimating the elasticity of marginal utility of income, emphasizing, inter alia, Spackman's (2004) conception for the determination of that parameter (of elasticity of marginal utility of income) by factors like moral dimension, personal saving behavior, risk aversion, income and price elasticities, (the distorting) impact of taxes[12]. They do not support the notion of zero-rate Pure Time Preference. Instead, they follow Arrow's (1995)[13] proposal for 1% tentative rate,

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[1] See ibid., c. 17.

[2] See ibid., c. 16.

[3] Valentim, Joice and Jose Mauricio Prado (May 6, 2008), "Social Discount Rates", available as pdf.

[4] Feldstein, Martin S. (1964), "The Social Time Preference Discount Rate in Cost Benefit Analysis", *The Economic Journal* 74, pp. 360-379; Feldstein, Martin S. (1965), "The derivation of social time preference rates", *Kyklos* 18, pp. 277-287; both cited through Valentim and Prado (2008, p. 2, p. 14.

[5] Spackman, Michael (1991), "Discount Rates and Rates of Return in the Public Sector: Economic Issues", *Government Economic Service Working Paper* № 112 (*Treasury Working Paper* № 58); Spackman, Michael (2004), "Time discounting and the cost of capital in government", *Fiscal Studies*, 25, pp. 467-518; both cited through Valentim and Prado (2008, p. 2, p. 15.

[6] Pearce, David and David Ulph (1995), "A social discount rate for the United Kingdom", *CSERGE Working Paper* GES 95-01; cited through Valentim and Prado (2008), p. 2, p. 15.

[7] Evans, David J. (2005), "The Elasticity of Marginal Utility of Consumption: Estimation for 20 OECD Countries", *Fiscal Studies*, 26, pp. 197-224; cited through Valentim and Prado (2008), p. 2, p. 13.

[8] See Valentim and Prado (2008), p. 3.

[9] Cowen, Tyler (2008), "Social Discount Rate", In: Steven Durlauf and Lawrence Blume (Eds). *The New Palgrave Dictionary of Economics*, 2nd edition. London: Palgrave Macmillan; cited through Valentim and Prado (2008), p. 3, p. 13.

[10] Spackman, Michael (2004), "Time discounting and the cost of capital in government", *Fiscal Studies*, 25, pp. 467-518; both cited through Valentim and Prado (2008), p. 2, p. 15.

[11] See Valentim and Prado (2008), p. 3.

[12] See ibid.

[13] Arrow, Kenneth J. (1995), "Intergenerational equity and the role of discount in long-term social investment", IEA World Congress, cited through Valentim and Prado (2008, p. 10, p. 13.

Nordhaus' (2007)[1] proposal for time discount rate of 1.5%, and similar proposals of other researchers, and orientate towards accepting an average value of Pure Time Preference Rate (PTPR) of 1%.[2]

Noting the wide application of Ramsey's equation[3], the two authors follow Feldstein (1965), where Feldstein develops *SRTP model based on microeconomic foundations, with the direct use of demographic variables*. After some rearrangements, the applicable estimation equation (formula) they reach is:

$$SRTP = (1 + \pi)^{1 - \alpha} (1 + \gamma)^{\sigma} (1 + r) - 1,$$

where

- *SRTP* is the Social Rate of Time Preference;
- $\pi$ is the rate of population growth between period t-1 and period t; it has positive effect on SRTP;
- $\alpha$ is the weight of the size of the population on the public utility; this parameter has negative effect on SRTP (the greater in value this parameter, the more SRTP decreases);
- $\gamma$ is the rate of growth of per capita income between periods t-1 and t; it has positive effect on SRTP;
- $\sigma$ is the coefficient of Relative Risk Aversion (RRA); it has clear positive effect on SRTP; it is said it is difficult to estimate RRA; for practical purposes it is accepted that the empirical value of the coefficient is between 1 and 4 (this quantitative assertion is according to estimates produced by research using macroeconomic models with standard preferences);
- *r* is the Pure Time Preference Rate (PTPR); it is intuitively accepted it has positive effect on SRTP (as is noted by Valentim and Prado, there is no consensus value of this parameter)[4].

As the authors write, the SRTP depends on several parameters: the weight of population, the population growth, the growth of per capita income, *the marginal utility of income, which they explicitly identify as being equal to the coefficient of relative risk aversion (RRA)*, and pure time preference rate (PTPR)[5]. Discussing Ramsey's additive formula, they explain $\mu$ [=*the elasticity of marginal utility of consumption*] identifying it as *the income elasticity of the marginal utility of income, also often described as relative risk aversion (RRA)*[6]. The elasticity of marginal utility of consumption is equal to RRA also in Spackman (2008, p. 20), where Spackman refers to Cowell and Gardiner (2000)[7] and to the well-known research on RRA of Barsky et al. (1997)[8]. It could be accepted as acknowledged that *the coefficient of RRA* (which, under certain restrictive conditions, could be derived as the reciprocal value of the coefficient of the elasticity of intertemporal substitution of consumption) *is seen as the empirical measure of the elasticity of marginal utility of consumption* (a systematized review of the derivation of this elasticity of marginal utility of consumption one could see in Spackman, 2008, pp. 19-22). The discussion of RRA parameter is of practical importance in Valentim and Prado's (2008) applied model of SRTP.

Feldstein (1965) notes that high values of $\sigma$ [=RRA] seem less relevant for the purposes of economic policy and proposes values for RRA between 1 and 2[9]. Stern (1977) [10] and Pearce and Ulph (1995)[11] are widely cited for estimates of the value of $\sigma$ [=RRA] in the range of 1 to 10, on the basis of three approaches: complete demand system analysis, von Neumann – Morgenstern utility functions, and saving behavior[12]. Valentim and Prado (2008) continue by noting that the RRA estimates based on choice under risk

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[1] Nordhaus, William (2007), "A Review of the Stern Review on Economics of Global Warming", *Journal of Economic Literature*, cited through Valentim and Prado (2008), p. 10-11, p. 15.

[2] See Valentim and Prado (2008), pp. 10-11.

[3] See Valentim and Prado (2008), p. 3.

[4] See Valentim and Prado (2008), pp. 5-7.

[5] See ibid., p. 7.

[6] See Valentim and Prado (2008), p. 3.

[7] Cowell, F. A. and K. Gardiner (2000), "Welfare Weights", *Economic Research Paper* 20 (oft282.pdf), London, Office of Fair Trading; cited through Spackman, M. (2008), p. 20, p. 24.

[8] Barsky, R. B., F. T. Juster, M. S. Kimbal, and M. D. Shapiro (1997), "Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in Health and Retirement Study", *The Quarterly Journal of Economics*, 112.2 (In memory of Amos Tversky), pp. 537-579; cited through Spackman, M. (2008), p. 20, p. 24.

[9] See Valentim and Prado (2008), p. 10.

[10] Stern, Nicholas (1977), "The marginal valuation of income", in Michael J. Artis and Robert Nobay (eds), *Studies in Modern Economic Analysis*, Oxford: Blackwell, cited through Valentim and Prado (2008, p. 10, p. 15.

[11] Pearce, David and Ulph, David (1995), A Social Discount Rate for the United Kingdom, *SCERGE Working Paper* 95-01, Centre for Social and Economic Research on the Global Environment, University of East Anglia, UK.

[12] See Valentim and Prado (2008), p. 10.

and uncertainty vary between 0 and 10 and even higher, referring to Lanot et al. (2006)[1], while estimates based on intertemporal choice vary less, referring to the authoritative Blundell et al. (1994)[2]. Through a reference to Evans (2005), they note that a research on 20 OECD countries, based on the structure of the personal income taxes, shows that, on average, $\sigma$ [=RRA] is close to 1.4[3]. Recently a new direction of research, having its own branches, strives after estimating utility of income by direct measurement of the satisfaction of life (see Layard et al., 2008; and for a reaction see Spackman, 2008, p. 21, and Valentim and Prado, 2008, p. 10). In Layard et al. (2008) the summarized estimate of the elasticity of marginal utility of consumption for 6 countries is 1.26 and is in a narrow interval of 1.19 to 1.34. This estimate of 1.26 is applied by Valentim and Prado (2008) for all 167 countries in their study (see one part of these SRTP estimates using this method in the Applications we offer at the end of this article).

Now, the calculated SRTP estimate for *Bulgaria* is 9.3%, while the calculated Emelianov's (2007) SRTP estimate for Bulgaria was below 4%. Valentim and Prado's (2008) estimate for Russia is 10% and coincides with Emelianov's (2007) estimate; and so on.

The use of one and the same value of the elasticity of the marginal utility of consumption, or RRA, for 167 countries, of course, is a drawback of the study. This is because the estimated coefficients of the elasticity of marginal utility of consumption and the other parameter estimates for such a large number of countries undoubtedly differ. Other RRA estimates, taken as empirical measures of this elasticity, according to the formula applied, will practically lead to other SRTP estimates of the Social Discount Rate (SDR).

For Bulgaria, analysis and the derived econometric estimates of RRA, achieved by direct and indirect methods for the period 1994-2000, show that before the introduction of the Currency Board in Bulgaria the more reliable direct RRA estimates are between 1.0 and 1.19, and after introducing it they fall below 0.5 and even below 0.3 (see Atanasov, 2005)[4].

Empirical estimations covering recent years for Bulgaria and extending SDR analysis and estimation within the frames of this approach is the next step of the present study.

## APPLICATIONS

*APPLICATION 1 [after Brent, 1993]*

**Table 1.** Estimates of Social Discount Rates (SDRs), based on life expectancy [after Brent, 1993, excerpt from Brent's *Country Estimates of Social Discount Rates*: Table 1. SDR Estimates Based on Life Expectancies, pp. 405-407]

| Country | Income per capita 1989, US $'s | Growth rate (g) 1965-1989 | Life Expectancy, 1965 | Life Expectancy, 1989 | Life Expectancy Discount Rate (LEDR) (□) |
|---|---|---|---|---|---|
| Turkey | 1 370 | 2,6 | 54 | 67 | 0,8988 |
| Poland | 1 790 | na | 69 | 71 | 0,1191 |
| Bulgaria | 2 320 | na | 70 | 73 | 0,1749 |
| Hungary | 2 590 | na | 70 | 71 | 0,0591 |
| Uruguay | 2 620 | 1,2 | 69 | 73 | 0,2348 |
| Yugoslavia | 2 920 | 3,2 | 66 | 72 | 0,3625 |
| Czechoslovakia | 3 450 | na | 70 | 72 | 0,1174 |
| Portugal | 4 250 | 3,0 | 65 | 75 | 0,5963 |
| Greece | 5 350 | 2,9 | 71 | 77 | 0,3380 |

[1] Lanot, Gauthier, Roger Hartley, and Ian Walker (2006), "Who really wants to be a millionaire: estimates of risk aversion from game show data", *Warwick Economic Research Paper* № 719; cited through Valentim and Prado (2008, p. 10, p. 14.

[2] Blundell, R., M. Browning, and C. Meghir (1994), "Consumer Demand and the Life-Cycle Allocation of Expenditure", *Review of Economic Studies* 61, pp. 57-80; cited through Valentim and Prado (2008, p. 10, p. 13.

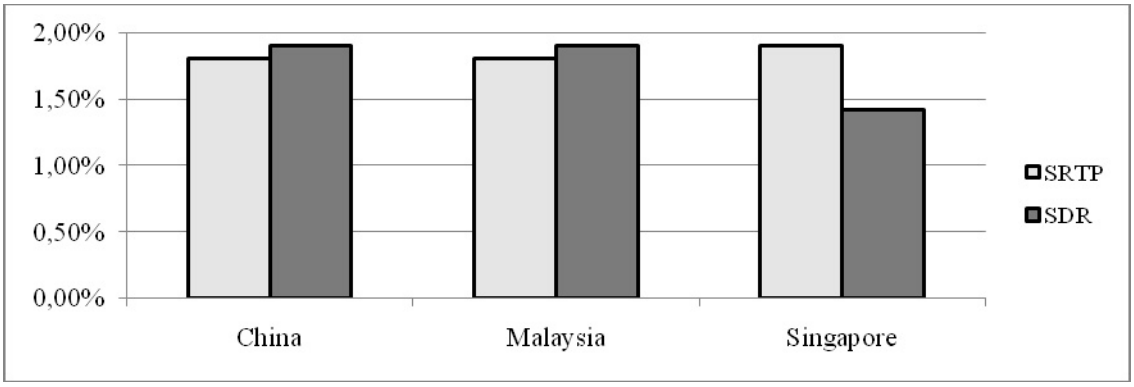
[3] See Valentim and Prado (2008), p. 10.

[4] Атанасов, Атанас П. (2005) Потребление и спестяване в България (интертемпорално заместване, 1994-2000). Автореферат на дисертационен труд за присъждане на образователна и научна степен "доктор". Университет за национално и световно стопанство, София.

| | | | | | |
|---|---|---|---|---|---|
| Romania | na | na | 68 | 71 | 0,1799 |
| Ireland | 8 710 | 2,1 | 71 | 74 | 0,1724 |
| Spain | 9 330 | 2,4 | 72 | 77 | 0,2797 |
| Israel | 9 790 | 2,7 | 73 | 76 | 0,1678 |
| New Zealand | 12 070 | 0,8 | 71 | 75 | 0,2284 |
| Australia | 14 360 | 1,7 | 71 | 77 | 0,3380 |
| United Kingdom | 14 610 | 2,0 | 71 | 76 | 0,2836 |
| Italy | 15 120 | 3,0 | 71 | 77 | 0,3380 |
| Netherlands | 15 920 | 1,8 | 74 | 78 | 0,2193 |
| Belgium | 16 220 | na | 71 | 77 | 0,3380 |
| Austria | 17 300 | 2,9 | 70 | 76 | 0,3427 |
| France | 17 820 | 2,3 | 72 | 77 | 0,2797 |
| Canada | 19 030 | 4,0 | 72 | 78 | 0,3335 |
| Germany | 20 440 | 2,4 | 70 | 76 | 0,3427 |
| Denmark | 20 450 | 1,8 | 73 | 75 | 0,1126 |
| United States | 20 910 | 1,6 | 71 | 76 | 0,2836 |
| Sweden | 21 570 | 1,8 | 74 | 78 | 0,2193 |
| Finland | 22 120 | 3,2 | 70 | 76 | 0,3427 |
| Norway | 22 290 | 3,4 | 74 | 78 | 0,2193 |
| Japan | 23 810 | 4,3 | 71 | 79 | 0,4449 |
| Switzerland* | 29 880 | 1,4 | 72 | 78 | 0,3351 |

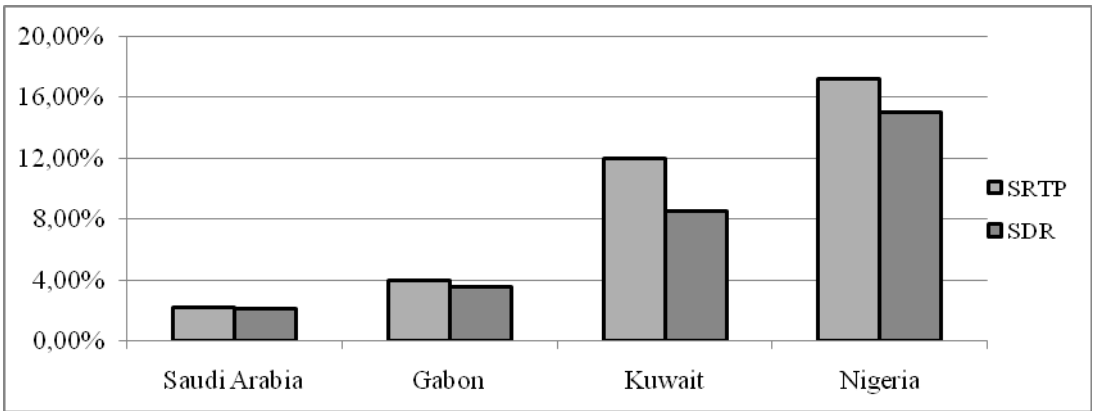
* Robert J. Brent' s note: The growth rate for Switzerland was wrongly recorded as 4,6% in the 1991 World Bank Development Report. The 1,4% figure in the table corresponds to previous report estimates (Brent thanks a referee of *Kyklos* for this correction).

***APPLICATION 2 [after Emelianov, 2007]***



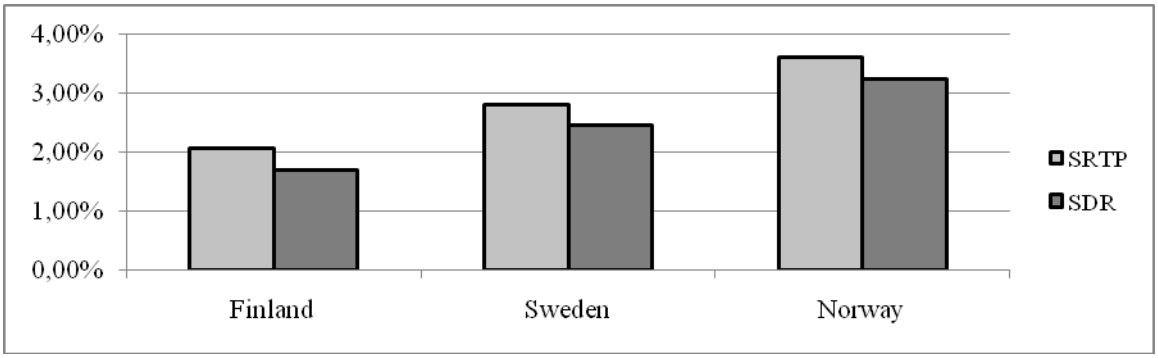

**Source:** Емельянов, А. М. (2007) "Оценка значения социальной ставки дисконтирования для России и проведение межстрановых сравнений", *Финансы и кредит*, № 46, 2007, http://www.hse.perm.ru/upload/files/public_005.pdf, с. 15: Диаграма 2.1. Социальная ставка дисконтирования для азиатских стран, 2006 г.

**Diagram 1.** Social Discount Rates (SDRs) and Social Rates of Time Preference (SRTP): Asian countries



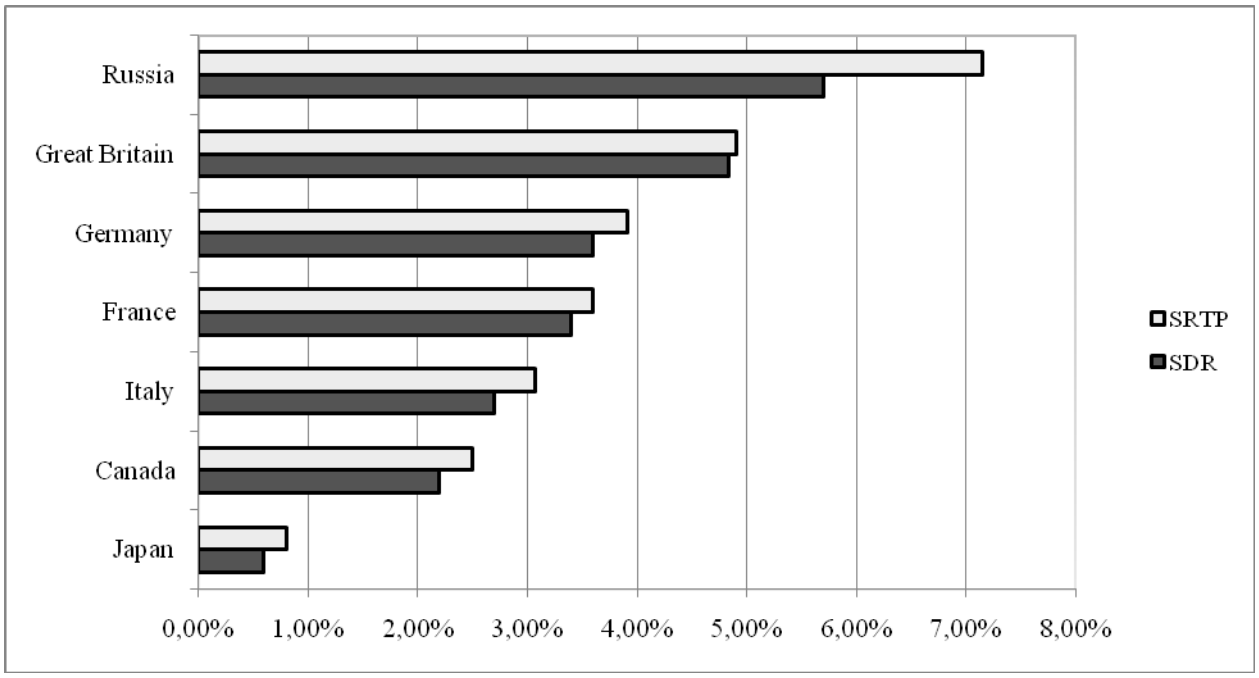

**Source:** Емельянов, А. М. (2007) "Оценка значения социальной ставки дисконтирования для России и проведение межстрановых сравнений", *Финансы и кредит*, № 46, 2007, http://www.hse.perm.ru/upload/files/public_005.pdf, с. 15: Диаграма 2.2. Социальная ставка дисконтирования для стран ОПЕК, 2006 г.

**Diagram 2.** Social Discount Rates (SDRs) and Social Rates of Time Preference (SRTP): OPEC countries



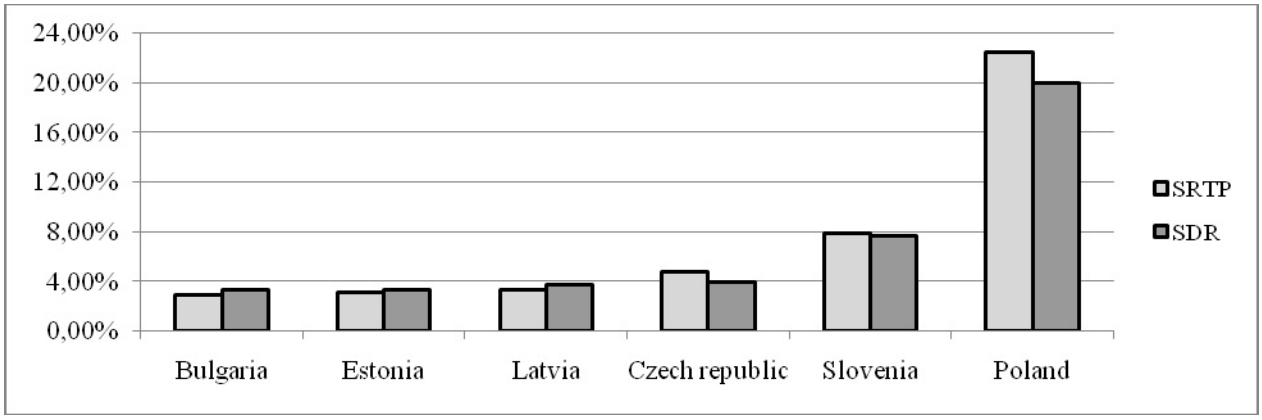

**Source:** Емельянов, А. М. (2007) "Оценка значения социальной ставки дисконтирования для России и проведение межстрановых сравнений", *Финансы и кредит*, № 46, 2007, http://www.hse.perm.ru/upload/files/public_005.pdf, с. 15-16: Диаграма 2.3. Социальная ставка дисконтирования для скандинавских стран, 2006 г.

**Diagram 3.** Social Discount Rates (SDRs) and Social Rates of Time Preference (SRTP): Scandinavian countries



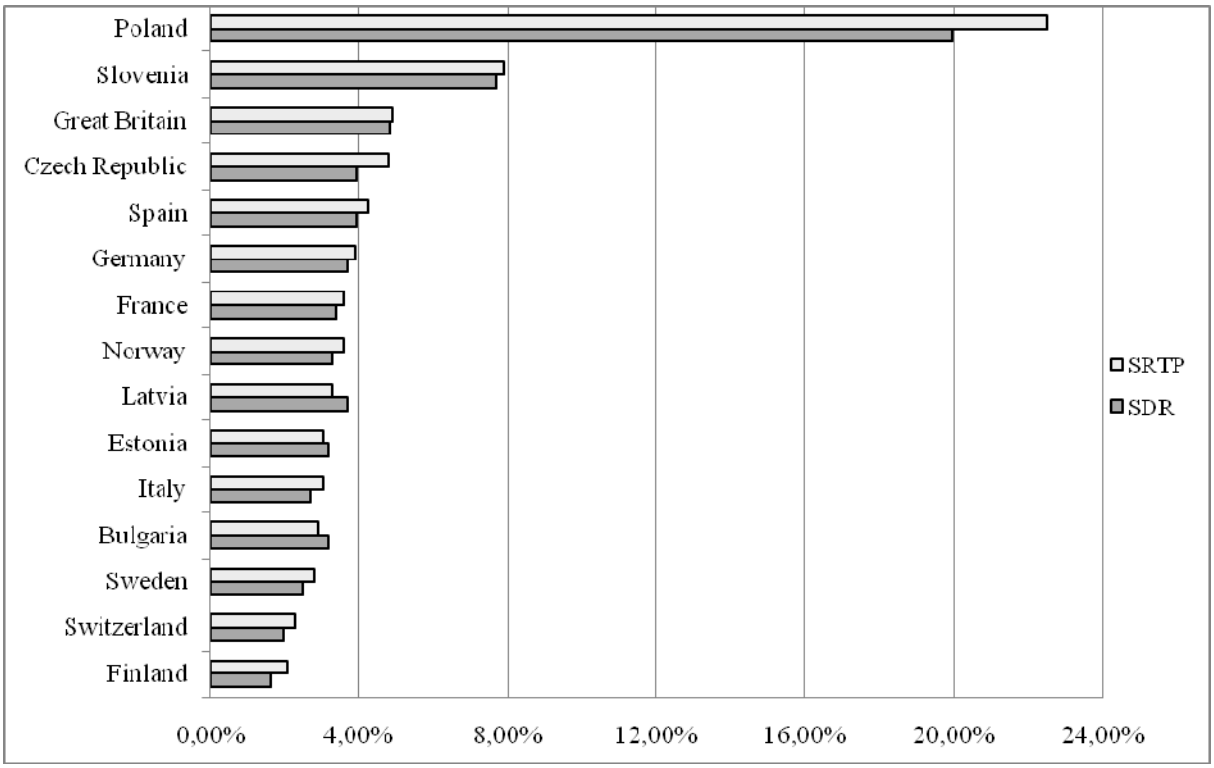

**Source:** Емельянов, А. М. (2007) "Оценка значения социальной ставки дисконтирования для России и проведение межстрановых сравнений", *Финансы и кредит*, № 46, 2007, http://www.hse.perm.ru/upload/files/public_005.pdf, с. 16: Диаграма 2.4. Социальная ставка дисконтирования для стран, входящих в Большую Восьмерку, 2006 г.

**Diagram 4.** *Social Discount Rates* (SDRs) and Social rates of Time Preference (SRTP): G-8 countries




**Source:** Емельянов, А. М. (2007) "Оценка значения социальной ставки дисконтирования для России и проведение межстрановых сравнений", *Финансы и кредит*, № 46, 2007, http://www.hse.perm.ru/upload/files/public_005.pdf, с. 16: Диаграма 2.5. Социальная ставка дисконтирования для стран Восточной Европы, 2006 г.

**Diagram 5.** Social Discount Rates (SDRs) and Social Rates of Time Preference (SRTP): Countries from Eastern Europe (EECs)




**Source:** Емельянов, А. М. (2007) "Оценка значения социальной ставки дисконтирования для России и проведение межстрановых сравнений", *Финансы и кредит*, № 46, 2007, http://www.hse.perm.ru/upload/files/public_005.pdf (19 pp.), с. 17, рис. 2.6. Социальная ставка дисконтирования для стран Европы, 2006 г.

**Diagram 6.** Social Discount Rates (SDRs) and Social Rates of Time Preference (SRTP): European countries

### *APPLICATION 3 [after Valentim and Prado, 2008]*

**Table 1.** Social Rates of Time Preference (SRTP) for different countries, 2006, in alphabetical order

Note: ***d*** is used for Social Rate of Time Preference (SRTP); in the columns to the left of ***d*** are the SRTP model parameters, as in Valentim and Prado (2008)

| Country | $\pi$ | $\gamma$ | $\alpha$ | $\sigma$ | $r$ | $d$ | min $d$ | max $d$ |
|---|---|---|---|---|---|---|---|---|
| Albania | 0,25 | 4,7 | 0,5 | 1,26 | 1,0 | 7,2 | 7,1 | 7,3 |
| Armenia | -0,30 | 13,7 | 0,5 | 1,26 | 1,0 | 18,6 | 18,8 | 18,4 |
| Australia | 0,94 | 1,4 | 0,5 | 1,26 | 1,0 | 3,3 | 2,8 | 3,8 |
| Austria | 0,08 | 3,0 | 0,5 | 1,26 | 1,0 | 4,9 | 4,9 | 4,9 |
| Belgium | 0,07 | 3,1 | 0,5 | 1,26 | 1,0 | 5,0 | 5,0 | 5,1 |
| Belarus | -0,61 | 10,8 | 0,5 | 1,26 | 1,0 | 14,6 | 15,0 | 14,2 |
| Bosnia and Herzegovina | 0,04 | 5,7 | 0,5 | 1,26 | 1,0 | 8,3 | 8,3 | 8,3 |
| Bulgaria | -0,53 | 6,7 | 0,5 | 1,26 | 1,0 | 9,3 | 9,5 | 9,0 |
| Canada | 0,80 | 2,0 | 0,5 | 1,26 | 1,0 | 3,9 | 3,5 | 4,4 |
| Croatia | -0,13 | 4,7 | 0,5 | 1,26 | 1,0 | 7,0 | 7,1 | 6,9 |
| Czech Republic | -0,15 | 6,2 | 0,5 | 1,26 | 1,0 | 8,9 | 9,0 | 8,8 |
| Denmark | 0,23 | 3,0 | 0,5 | 1,26 | 1,0 | 4,9 | 4,8 | 5,0 |
| Finland | 0,17 | 5,3 | 0,5 | 1,26 | 1,0 | 7,9 | 7,8 | 8,0 |
| France | 0,27 | 1,7 | 0,5 | 1,26 | 1,0 | 3,3 | 3,2 | 3,5 |
| Georgia | -0,85 | 10,3 | 0,5 | 1,26 | 1,0 | 13,8 | 14,3 | 13,4 |
| Germany | -0,07 | 2,9 | 0,5 | 1,26 | 1,0 | 4,6 | 4,7 | 4,6 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Greece | 0,08 | 4,2 | 0,5 | 1,26 | 1,0 | 6,4 | 6,4 | 6,5 |
| Hungary | -0,31 | 4,2 | 0,5 | 1,26 | 1,0 | 6,2 | 6,4 | 6,1 |
| Iceland | 0,75 | 1,8 | 0,5 | 1,26 | 1,0 | 3,7 | 3,3 | 4,1 |
| India | 1,39 | 7,7 | 0,5 | 1,26 | 1,0 | 11,7 | 10,9 | 12,4 |
| Iran | 1,32 | 4,4 | 0,5 | 1,26 | 1,0 | 7,4 | 6,7 | 8,1 |
| Ireland | 1,21 | 4,7 | 0,5 | 1,26 | 1,0 | 7,7 | 7,1 | 8,4 |
| Italy | -0,06 | 2,0 | 0,5 | 1,26 | 1,0 | 3,5 | 3,5 | 3,4 |
| Japan | -0,16 | 2,4 | 0,5 | 1,26 | 1,0 | 3,9 | 4,0 | 3,9 |
| Kazakhstan | 1,06 | 9,4 | 0,5 | 1,26 | 1,0 | 13,8 | 13,2 | 14,4 |
| Latvia | -0,60 | 12,6 | 0,5 | 1,26 | 1,0 | 16,9 | 17,3 | 16,6 |
| Lithuania | -0,51 | 8,1 | 0,5 | 1,26 | 1,0 | 11,1 | 11,4 | 10,8 |
| Macedonia, FYR | 0,19 | 2,9 | 0,5 | 1,26 | 1,0 | 4,8 | 4,7 | 4,9 |
| Moldova | -0,87 | 4,9 | 0,5 | 1,26 | 1,0 | 6,8 | 7,3 | 6,4 |
| Montenegro | -0,32 | 6,8 | 0,5 | 1,26 | 1,0 | 9,6 | 9,8 | 9,4 |
| New Zealand | 0,65 | 1,0 | 0,5 | 1,26 | 1,0 | 2,7 | 2,3 | 3,0 |
| Norway | 0,44 | 2,4 | 0,5 | 1,26 | 1,0 | 4,4 | 4,1 | 4,6 |
| People's republic of China | 0,56 | 10,1 | 0,5 | 1,26 | 1,0 | 14,3 | 14,0 | 14,6 |
| Poland | -0,14 | 5,9 | 0,5 | 1,26 | 1,0 | 8,5 | 8,6 | 8,4 |
| Portugal | 0,38 | 0,9 | 0,5 | 1,26 | 1,0 | 2,4 | 2,2 | 2,6 |
| Romania | -0,43 | 8,2 | 0,5 | 1,26 | 1,0 | 11,3 | 11,5 | 11,0 |
| Russian Federation | -0,52 | 7,3 | 0,5 | 1,26 | 1,0 | 10,0 | 10,3 | 9,7 |
| Serbia | -0,02 | 5,8 | 0,5 | 1,26 | 1,0 | 8,5 | 8,5 | 8,4 |
| Serbia and Montenegro | -0,11 | 6,2 | 0,5 | 1,26 | 1,0 | 8,9 | 9,0 | 8,9 |
| Slovak Republic | -0,04 | 8,3 | 0,5 | 1,26 | 1,0 | 11,7 | 11,7 | 11,6 |
| Slovenia | -0,15 | 5,4 | 0,5 | 1,26 | 1,0 | 7,8 | 7,9 | 7,7 |
| Spain | 0,34 | 3,5 | 0,5 | 1,26 | 1,0 | 5,7 | 5,5 | 5,9 |
| Sweden | 0,24 | 4,1 | 0,5 | 1,26 | 1,0 | 6,4 | 6,3 | 6,6 |
| Switzerland | 0,06 | 2,6 | 0,5 | 1,26 | 1,0 | 4,4 | 4,4 | 4,4 |
| The Netherlands | 0,32 | 2,6 | 0,5 | 1,26 | 1,0 | 4,5 | 4,3 | 4,6 |
| Turkey | 1,21 | 4,8 | 0,5 | 1,26 | 1,0 | 7,8 | 7,2 | 8,5 |
| Ukraine | -1,07 | 8,3 | 0,5 | 1,26 | 1,0 | 11,0 | 11,6 | 10,4 |
| United Kingdom | 0,22 | 2,6 | 0,5 | 1,26 | 1,0 | 4,4 | 4,3 | 4,5 |
| United States | 0,87 | 2,4 | 0,5 | 1,26 | 1,0 | 4,5 | 4,1 | 5,0 |
| Uruguay | 0,22 | 6,8 | 0,5 | 1,26 | 1,0 | 9,9 | 9,8 | 10,0 |
| Uzbekistan | 1,43 | 5,8 | 0,5 | 1,26 | 1,0 | 9,2 | 8,4 | 10,0 |

**Table 2.** Social Rates of Time Preference (SRTP) for different countries, 2006, arranged according to the increase of the value of d (SRTP)

**Note:** ***d*** is used for Social rate of Time Preference (SRTP); in the columns to the left of ***d*** are the SRTP model parameters, as in Valentim and Prado (2008)

| **Country** | $\pi$ | $\gamma$ | $\alpha$ | $\sigma$ | ***r*** | ***d*** | ***min d*** | ***max d*** |
|---|---|---|---|---|---|---|---|---|
| Portugal | 0,38 | 0,9 | 0,5 | 1,26 | 1,0 | 2,4 | 2,2 | 2,6 |
| New Zealand | 0,65 | 1,0 | 0,5 | 1,26 | 1,0 | 2,7 | 2,3 | 3,0 |
| Australia | 0,94 | 1,4 | 0,5 | 1,26 | 1,0 | 3,3 | 2,8 | 3,8 |
| France | 0,27 | 1,7 | 0,5 | 1,26 | 1,0 | 3,3 | 3,2 | 3,5 |
| Italy | -0,06 | 2,0 | 0,5 | 1,26 | 1,0 | 3,5 | 3,5 | 3,4 |
| Iceland | 0,75 | 1,8 | 0,5 | 1,26 | 1,0 | 3,7 | 3,3 | 4,1 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Canada | 0,80 | 2,0 | 0,5 | 1,26 | 1,0 | 3,9 | 3,5 | 4,4 |
| Japan | -0,16 | 2,4 | 0,5 | 1,26 | 1,0 | 3,9 | 4,0 | 3,9 |
| Norway | 0,44 | 2,4 | 0,5 | 1,26 | 1,0 | 4,4 | 4,1 | 4,6 |
| Switzerland | 0,06 | 2,6 | 0,5 | 1,26 | 1,0 | 4,4 | 4,4 | 4,4 |
| United Kingdom | 0,22 | 2,6 | 0,5 | 1,26 | 1,0 | 4,4 | 4,3 | 4,5 |
| The Netherlands | 0,32 | 2,6 | 0,5 | 1,26 | 1,0 | 4,5 | 4,3 | 4,6 |
| United States | 0,87 | 2,4 | 0,5 | 1,26 | 1,0 | 4,5 | 4,1 | 5,0 |
| Germany | -0,07 | 2,9 | 0,5 | 1,26 | 1,0 | 4,6 | 4,7 | 4,6 |
| Macedonia, FYR | 0,19 | 2,9 | 0,5 | 1,26 | 1,0 | 4,8 | 4,7 | 4,9 |
| Austria | 0,08 | 3,0 | 0,5 | 1,26 | 1,0 | 4,9 | 4,9 | 4,9 |
| Denmark | 0,23 | 3,0 | 0,5 | 1,26 | 1,0 | 4,9 | 4,8 | 5,0 |
| Belgium | 0,07 | 3,1 | 0,5 | 1,26 | 1,0 | 5,0 | 5,0 | 5,1 |
| Spain | 0,34 | 3,5 | 0,5 | 1,26 | 1,0 | 5,7 | 5,5 | 5,9 |
| Hungary | -0,31 | 4,2 | 0,5 | 1,26 | 1,0 | 6,2 | 6,4 | 6,1 |
| Greece | 0,08 | 4,2 | 0,5 | 1,26 | 1,0 | 6,4 | 6,4 | 6,5 |
| Sweden | 0,24 | 4,1 | 0,5 | 1,26 | 1,0 | 6,4 | 6,3 | 6,6 |
| Moldova | -0,87 | 4,9 | 0,5 | 1,26 | 1,0 | 6,8 | 7,3 | 6,4 |
| Croatia | -0,13 | 4,7 | 0,5 | 1,26 | 1,0 | 7,0 | 7,1 | 6,9 |
| Albania | 0,25 | 4,7 | 0,5 | 1,26 | 1,0 | 7,2 | 7,1 | 7,3 |
| Iran | 1,32 | 4,4 | 0,5 | 1,26 | 1,0 | 7,4 | 6,7 | 8,1 |
| Ireland | 1,21 | 4,7 | 0,5 | 1,26 | 1,0 | 7,7 | 7,1 | 8,4 |
| Slovenia | -0,15 | 5,4 | 0,5 | 1,26 | 1,0 | 7,8 | 7,9 | 7,7 |
| Turkey | 1,21 | 4,8 | 0,5 | 1,26 | 1,0 | 7,8 | 7,2 | 8,5 |
| Finland | 0,17 | 5,3 | 0,5 | 1,26 | 1,0 | 7,9 | 7,8 | 8,0 |
| Bosnia and Herzegovina | 0,04 | 5,7 | 0,5 | 1,26 | 1,0 | 8,3 | 8,3 | 8,3 |
| Poland | -0,14 | 5,9 | 0,5 | 1,26 | 1,0 | 8,5 | 8,6 | 8,4 |
| Serbia | -0,02 | 5,8 | 0,5 | 1,26 | 1,0 | 8,5 | 8,5 | 8,4 |
| Czech Republic | -0,15 | 6,2 | 0,5 | 1,26 | 1,0 | 8,9 | 9,0 | 8,8 |
| Serbia and Montenegro | -0,11 | 6,2 | 0,5 | 1,26 | 1,0 | 8,9 | 9,0 | 8,9 |
| Uzbekistan | 1,43 | 5,8 | 0,5 | 1,26 | 1,0 | 9,2 | 8,4 | 10,0 |
| Bulgaria | -0,53 | 6,7 | 0,5 | 1,26 | 1,0 | 9,3 | 9,5 | 9,0 |
| Montenegro | -0,32 | 6,8 | 0,5 | 1,26 | 1,0 | 9,6 | 9,8 | 9,4 |
| Uruguay | 0,22 | 6,8 | 0,5 | 1,26 | 1,0 | 9,9 | 9,8 | 10,0 |
| Russian Federation | -0,52 | 7,3 | 0,5 | 1,26 | 1,0 | 10,0 | 10,3 | 9,7 |
| Ukraine | -1,07 | 8,3 | 0,5 | 1,26 | 1,0 | 11,0 | 11,6 | 10,4 |
| Lithuania | -0,51 | 8,1 | 0,5 | 1,26 | 1,0 | 11,1 | 11,4 | 10,8 |
| Romania | -0,43 | 8,2 | 0,5 | 1,26 | 1,0 | 11,3 | 11,5 | 11,0 |
| India | 1,39 | 7,7 | 0,5 | 1,26 | 1,0 | 11,7 | 10,9 | 12,4 |
| Slovak Republic | -0,04 | 8,3 | 0,5 | 1,26 | 1,0 | 11,7 | 11,7 | 11,6 |
| Georgia | -0,85 | 10,3 | 0,5 | 1,26 | 1,0 | 13,8 | 14,3 | 13,4 |
| Kazakhstan | 1,06 | 9,4 | 0,5 | 1,26 | 1,0 | 13,8 | 13,2 | 14,4 |
| People's republic of China | 0,56 | 10,1 | 0,5 | 1,26 | 1,0 | 14,3 | 14,0 | 14,6 |
| Belarus | -0,61 | 10,8 | 0,5 | 1,26 | 1,0 | 14,6 | 15,0 | 14,2 |
| Latvia | -0,60 | 12,6 | 0,5 | 1,26 | 1,0 | 16,9 | 17,3 | 16,6 |
| Armenia | -0,30 | 13,7 | 0,5 | 1,26 | 1,0 | 18,6 | 18,8 | 18,4 |

**Source:** Valentim, Joice and Jose Mauricio Prado (2008) “Social Discount Rates” (May 6, 2008), pdf (23 pp.), p. 17-21; excerpt from Table 7: Social time preference rates for various countries, 2006; Sources: World Bank (2007), Layard et al. (2008), and calculations done by the authors [Valentim and Prado, 2008].

# BETWEEN-COUNTRY INCOME INEQUALITY IN EUROPEAN UNION OVER THE LAST DECADE[1]

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**Abstract**

*The income inequality is important macroeconomic phenomenon which has nature of inexhaustible actuality both in length of time, and in geographic aspect.*

*This article deals with the between-country income inequality across the European Union countries. The author attempts to clarify how changes the between-country inequality over the last decade - time of staggering permutation and does it give the different response of the countries on the global changes. Income inequality is the internal threat of sustainable development as well. The certain income equality creates the necessary condition for sustainable long-term growth of the European Union overall.*

*The main finding shows that people's welfare characterized by GDP per capita has improved over the last decade (from 2000 till 2009) in European countries while between- country inequality has not changed significantly and is still relatively high. Analytical methods such as statistical data analysis, graphical methods are used.*

**Keywords:** income inequality, European Union, Gini, GDP per capita, I390

Income inequality is complicated and very conflicting phenomenon of socioeconomics. On this issue have paid attention not only economists but also politicians, socialists and scientists whose fields are related to criminology, health care, education. Wide range of scientists have interested in inequality and its connection with various phenomena in the different fields of science. The author analyses income inequality between European Union countries and attempts to show unequal hierarchy of incomes.

The article is composed as follows firstly short description about some theoretical aspects such as income levels and effects of income inequality, factors which determine income inequality at international level are given. Then author analyses facts and figures to reflect income inequality between European Union countries over the last decade. The article ends with discussion and conclusions.

## Theoretical aspects of income inequality

Literature review shows that effects of income inequality mainly have negative character. Briefly noted several scientists argue the violence is more widespread in societies with bigger income differences [4; 6; 7; 9]. Wilkinson [14] shows that higher inequality deals with lower efficiency of health care. Less public participation, less reliant on each other is one more effect of income inequality [13; 12]. However the author of this paper focuses on income inequality in the economic aspect. Mostly scientists recognize that higher income inequality lead to slower economic growth [3; 11; 10]. For example high initial income inequality entails social tensions and political instability that cause increasing uncertainty, lower investment. And there is the result - lower investment lower economic growth.

Income inequality can be studied at three levels (or three inequality concepts as pointed out by Milanovic [8]):

- Within-Country Inequality - income inequality among population or groups of population within one nation or region. The most widely used measurement of the within-country inequality is Gini coefficient. This inequality deals with convergence and divergence of countries;

Between-Country or International Inequality - inequality among countries. The measurement of the between-country inequality is gross domestic product (GDP) per capita. International inequality tries to take into account countries unequal population size by weighting each country by its population;

[1] This work has been supported by the European Social Fund within the project «Support for Doctoral Studies at University of Latvia».

- Global Inequality - there are two methodological approaches to measuring global inequality. One assumes world as one huge country and calculate income inequality among the world's inhabitants obtained the Gini coefficient of the world. The second approach is (by definition of global inequality) composed of population-weighted international inequality and inequality due to income differences within countries.

There are some interesting facts about global inequality and these facts lead us to think:

- 40% of the world's population receives 5% of global income
- 10% (25%), the world's richest people receive 54% (75%) of world income
- 2.5 billion people live on less than $ 2 per day.

According to a lot of different studies can be said that about 55 - 82 % of income inequality at international level is determined by energy consumption, democracy level,

education level, agrarian sector, foreign investment, agricultural density, percentage of the population under the age of 15 years, state in the global hierarchy.

All three levels are interrelated the global inequality essentially embraces both between-country and within-country inequality. It should be pointed out that in this article the author analyses international inequality in definite region - inequality between European Union countries.

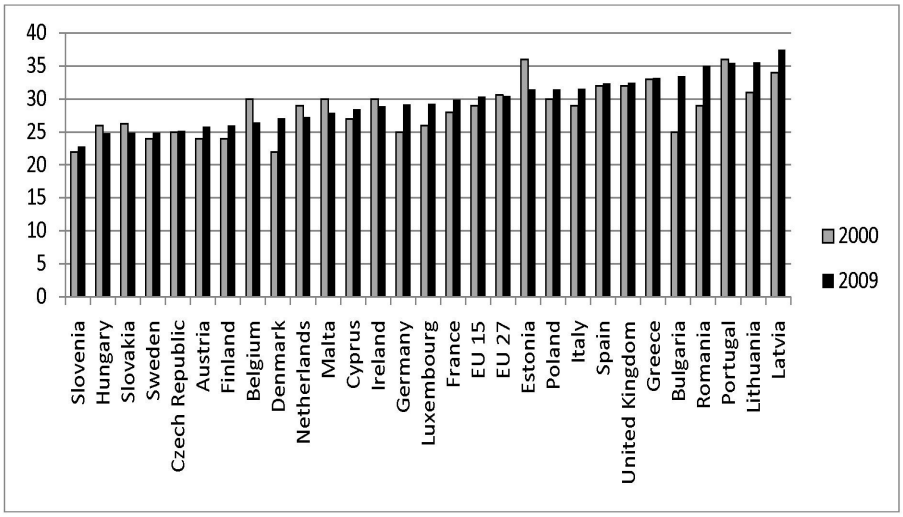
## Income inequality between European Union countries

Further author analyses numerical indicators of income inequality from 2000 to 2009 to show changes in between-country inequality in European Union during this period of time. The author used data from Statistical Bureau of European Commission Eurostat [15]. Recent data of these indicators for 2010 are not available yet. Data for 2000 are not available for all countries too. To compare data for some countries in different years are used: for Czech Republic, Sweden and Demark data from 2001, Cyprus - 2003, Slovakia and data for ES 27 - 2005. As there is no detailed analysis but rather evaluated the overall trend then the non- compliance of data after years has not so much sense.

In Figure 1 Gini coefficient is shown. Gini index or, if it is expressed as a percentage, Gini coefficient is widely used numerical indicator of inequality. At the absolute equality Gini is zero. The higher it is the more unequal is income distribution.

Over the last decade Gini coefficient in average in EU 27 and EU 15 did not change significantly. There was a slight increase in the coefficient in EU 15 from 29 % in 2000 to 30,3 % in 2009 and negligible decrease in EU 27 from 30,6 % in 2005 to 30,4 % in 2009. However we see (Figure 1) only two countries in which income inequality decreased significantly in a given period of time. We can note Belgium and Estonia where Gini coefficient decreased respectively from 30 % and 36 % in 2000 to 26,4 % and 31,4 % in 2009. A slight decrease of income inequality was observed in Hungary, Slovakia, Netherlands and Malta where Gini coefficient in 2009 decreased between 5 - 10 % against 2000. At the same time there were number of countries in which Gini coefficient increased significantly. There we can note both developed countries such as Denmark, Germany, Luxembourg and transition countries such as Bulgaria, Romania, Lithuania and Latvia. The largest rise of Gini coefficient in 2009 against 2000 was in Bulgaria by 33,6 % and in Denmark by 22,73 %. The most unequal income distribution in 2009 was in Latvia. It was 37,4 %. Then with high income inequality are Lithuania, Portugal and Romania. The most equal societies by incomes are in Slovenia, Hungary, Slovakia, Sweden and Czech Republic.

[2] Gini coefficient as inequality indicator has both advantages and disadvantages. More details are available at Allison [1]; Fossett and South [5]; Conceigao and Ferreira [2]



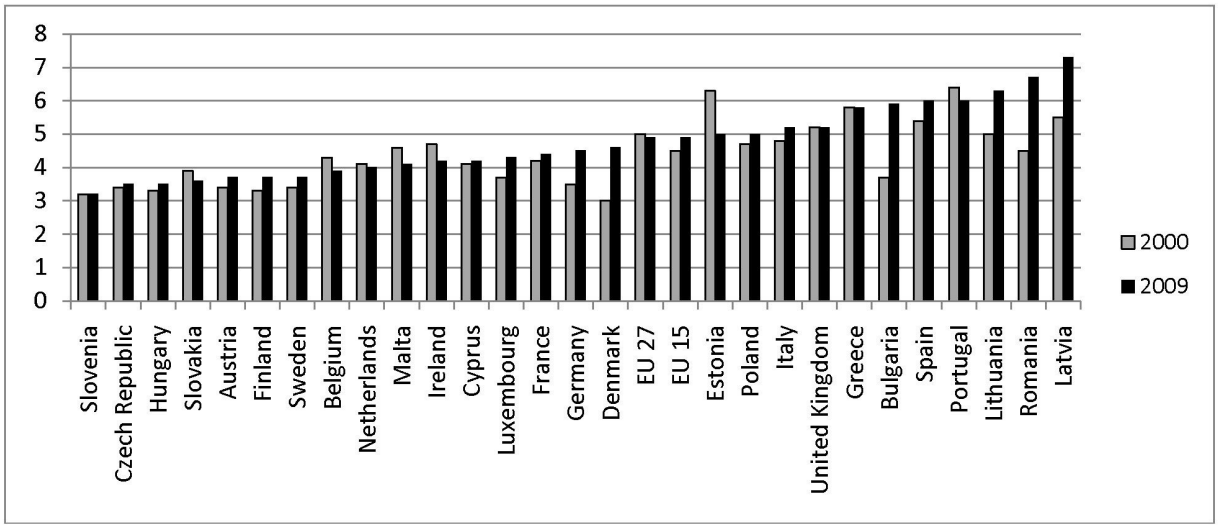

***Data source:*** Eurostat

**Note:** Data for 2000 are not available for all countries. Instead data in different years are used: for Czech Republic, Sweden and Demark data from 2001, Cyprus - 2003, Slovakia and data for ES 27 - 2005

**Figure 1.** Gini coefficient (%), (2000, 2009)

The same situation is observed by using other income inequality index - S80/S20 - income quintile share ratio or inequality of income distribution. It shows how much higher is 20 % richest people incomes than 20 % poorest incomes. In Figure 2 income quintile share ratio is shown for European Union countries in 2000 and 2009.

In average in EU 27 countries income quintile share ratio was 4,9 in 2009 and it is the same as in EU 15. Inequality of income distribution has increased in 15 EU from 4,5 in 2000 to 4,9 in 2009. In most countries income distribution did not change significantly. However there were substantial changes in income distribution in some countries by income quintile share ratio. In Estonia income inequality decreased from 6,3 in 2000 to 5,0 in 2009 reaching average for EU 27 and EU 15. It was the case with the largest equalization of income distribution in European Union. Income quintile share ratio slightly decreased over the last decade in Slovakia, Belgium, Netherlands, Malta, Ireland and Portugal. At the same time income inequality has increased significantly in several countries. In Latvia from 5,5 in 2000 to 7,3 in 2009, respectively in Romania from 4,5 to 6,7, in Lithuania from 5,0 to 6,3, in Bulgaria from 3,7 to 5,9, in Denmark from 3,0 to 4,6 and in Germany from 3,5 to 4,5. Also income quintile share ratio slightly increased in Austria, Finland, Sweden, Luxembourg, Poland, Italy and Spain.




**Note:** Data for 2000 are not available for all countries. Instead data in different years are used: for Czech Republic, Sweden and Demark data from 2001, Cyprus - 2003, Slovakia and data for ES 27 - 2005.

**Data source:** Eurostat

**Figure 2. Inequality of income distribution - S80/S20** (2000, 2009)

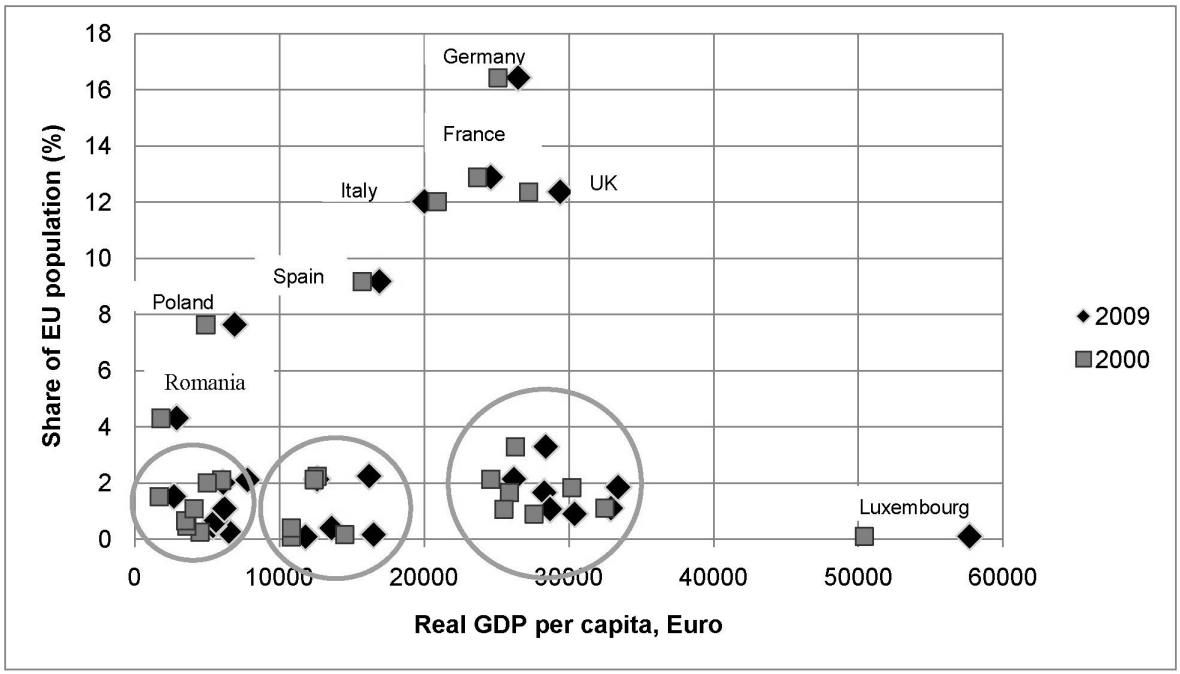
If we do not take into account negligible changes in indicators of income inequality then we find that over the last decade income distribution has deteriorated in many European Union countries (Table 1) despite the EU average that did not change significantly during this period. Income inequality has risen to greater or lesser extent in 16 European Union countries and in 8 countries has fallen. There was no difference transition or developed country, inequality has risen or fallen in both cases. For further study would be useful to analyse income distribution in countries where income inequality both has increased and decreased significantly to understand the reasons of the constitutive income inequality changes over the last decade.

**Table 1.** Income inequality changes in European Union countries from 2000 to 2009

| Income inequality | Developed countries | Transition countries | Total |
|---|---|---|---|
| A significant increase | Denmark, Germany, Luxembourg | Bulgaria, Romania, Lithuania, Latvia | 7 |
| A slight increase | Austria, Finland, Italy, France, Sweden, United Kingdom, Cyprus | Slovenia, Poland | 9 |
| Constant | Spain, Greece | Czech Republic | 3 |
| A slight decrease | Netherlands, Portugal, Ireland, Malta | Hungary, Slovakia | 6 |
| A significant decrease | Belgium | Estonia | 2 |

In Figure 3 on the horizontal axis is real gross domestic product (GDP) per capita in Euro. On vertical axis is share of population. Points describe data of the certain European Union country in 2000 and 2009.

These data show that well-being of population in the most of European countries has risen in greater or lesser degree while income hierarchy of countries by GDP per capita has not changed and income distribution between European Union countries in 2009 was largely the same as in 2000.




**Source:** calculated and developed by the author from the data of Eurostat

**Figure 3.** The distribution of EU population by GDP per capita

The three groups of small countries are clearly visible and it shows between-country inequality in European Union. Share of population of all these countries each are no more than 4 % of the total European Union population.

1. GDP per capita to 10 000 Euro - Bulgaria, Czech Republic, Estonia, Latvia, Lithuania, Hungary, Slovakia.In this group we can also include Romania which population is a little more than 4 % of the EU population.
2. GDP per capita from 10 000 to 20 000 Euro - Greece, Cyprus, Malta, Portugal, Slovenia
3. GDP per capita from 25 000 to 35 000 Euro - Belgium, Denmark, Ireland, Netherlands, Austria, Finland, Sweden

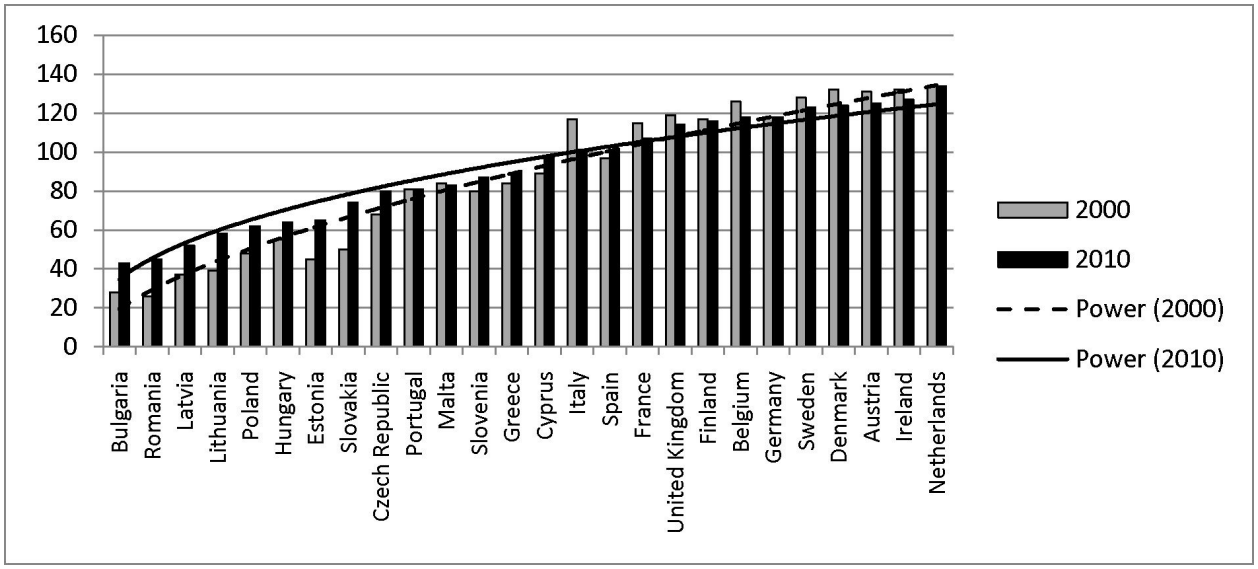
We can also add the fourth group which consists of one country:

4. GDP per capita from 50 000 Euro - Luxembourg

Countries with share of population from about 8 % and more we can group the following:

1. GDP per capita to 10 000 Euro - Poland
2. GDP per capita from 10 000 to 20 000 Euro - Spain
3. GDP per capita from 20 000 to 30 000 Euro - Germany, France, Italy and United Kingdom

Hierarchy of income distribution between countries is quite stable and it is unlikely that this situation will change in coming decades. If we speak about the last decade there were number of cases when the rapid economic growth improved well-being of population. This connection it may be noted the transition economies such as Bulgaria, Estonia, Latvia, Lithuania, Romania and Slovakia. However these countries still can not reach the level of the advanced European Union countries (Figure 4). At the same time in advanced countries GDP per capita in purchasing power standards has decreased however more slowly than GDP per capita (PPS) increase in transition countries. It points to a slow convergence of income inequality between European Union countries over the last decade.




**Source:** calculated and developed by the author from the data of Eurostat

**Note:** Luxembourg has excluded as the extreme case. GDP per capita (PPS) was 245 of EU 27 in 2000 and has risen to 283 in 2010

**Figure 4.** GDP per capita in Purchasing Power Standards (PPS) (EU-27 = 100)

It should be noted Italy where GDP per capita in PPS has fallen from 117 in 2000 to 100 in 2010. It was the largest rate reduction over the last decade among the European Union countries.

**Conclusions**

- Income distribution has deteriorated in many European Union countries. There was no difference transition or advanced country, over the last decade inequality has risen significantly in Demark, Germany, Luxembourg, Bulgaria, Romania, Lithuania and Latvia. It should be noted that substantial decrease of income inequality in Belgium and Estonia has observed. It would be useful to analyze these extreme cases to understand the reasons of the constitutive income inequality changes over the last decade.
- At the same time the well-being of population of European Union countries has risen especially in transition countries which can be characterize as small and open economies.

- The European Union countries structure income hierarchy by GDP per capita and share of population as shown in Table 2.

**The distribution of European Union countries by GDP per capita and share of population from 2000 to 2009**

**Table 2**

| GDP per capita (Euro) | Share of population | |
|---|---|---|
| | To 4 % | More than 4 % |
| To 10 000 | **Bulgaria,** Czech Republic, *Estonia*, **Latvia, Lithuania,** Hungary, Slovakia, **Romania*** | Poland |
| 10 000 - 20 000 | Greece, Cyprus, Malta, Portugal, Slovenia | Spain |
| 20 000 - 35 000 | *Belgium,* **Denmark,** Ireland, Netherlands, Austria, Finland, Sweden | **Germany,** France, Italy and United Kingdom |
| More than 35 000 | **Luxembourg** | |

**Note:** *Romania which population is a little more than 4 % of the European Union population can also be included in this group

**Note:** Countries marked in bold - income inequality has increased significantly; countries marked in italic - income inequality has decreased significantly

- A slow convergence of income distribution between European Union countries has observed. In advanced countries GDP per capita (PPS) has decreased however more slowly than it increase in transition countries. Nevertheless hierarchy of income distribution between countries is quite stable and still relatively high. It is unlikely that this situation will change substantially in coming decades.
- Relative equalization of incomes is one of the conditions that create equal opportunities for all European Union countries that ensure even and stable economic growth of the European Union as a whole.

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# GREENING ECONOMY AND COMPETITIVENESS

**Rumen Gechev**[1]

**Abstract**

*The relationship between the greening economy and the competitiveness is contradictive depending on various endogenous and exogenous factors. In some cases the environmentally-friendly production is cost effective, both in the long and in the short-run. In other cases the improvement of the environmental parameters leads to relatively higher cost and lower price competitiveness. This study is focused on the eco-fiscal policy impact on the competitiveness. The main idea is that this impact must be handled by all competitors (countries and companies). It supposes certain harmonization of the eco-fiscal stimuli and introduction of new compensating mechanisms in the foreign trade.*

**Keywords**: eco-taxes, environmental footprint, compensatory mechanisms, border tax adjustments, green fiscal reform,

## Introduction

The globalization of the world economy has created conditions for enhancing competition and for the gradual obliteration of boundaries between national and international markets. The removal of trade barriers and the free movement of goods and capital have opened up opportunities for expanding business and growing profits that have been unseen thus far. On the other hand, however, this has multiplied the challenges, which business has to face nowadays, because of the enlarging scale of an increasingly keener price and non-price competition. This is the reason why the price structure optimization of whatever companies produce, focused on a constant lowering of manufacturing costs and maintaining a sufficiently high quality of products, is a mandatory condition for business to survive.

The high dynamism of economic development in the post-World-War-II years, the current impressive growth rates of China and India included, accelerated the process of non-renewable resource depletion. Besides, we have now gone beyond the point where nature was capable of absorbing the hazardous emissions and piles of toxic waste. Gradually and almost irreversibly, the disturbed environmental equilibrium is becoming a hindrance to growth, increasing its social costs at the same time. This explains the reason why the United Nations Organization, the European Union, and individual countries are working out and applying a system of market and non-market instruments designed to slow down and halt this process altogether with the hope of gradually placing economic growth on a sustainable basis.

## Eco-taxes

This study focuses on the eco-tax policy, which is among the key instruments for achieving a greening economy. It helps attain several mutually connected objectives, such as:

(1) discouraging the polluting companies by introducing respective taxes or increasing their tax burden, which brings about (2) a fiscal competitive advantage for manufacturers who pollute less or do not pollute the environment altogether. This helps raise (3) additional budget revenues, which serve the purpose of (4) extending direct or indirect subsidies or entering into public-private partnerships aimed at the development and commissioning of respective environmentally-friendly technologies.

Eco-taxes have a multi-dimensional impact on competitiveness both in the short-term and long-term period of time. On the whole, in the short-term they burden the expenditure part of the production process and vice versa – in the longer-term they give comparative advantages to the environmentally-friendly manufacturers. It is only natural for this general principle to have exception, as both the extent and direction of its impact depend on the type of production, the share of the additional eco-tax within the overall mix of costs, on the fact whether the respective manufacturer is a newly established company or a business, which has had sufficient time to adapt to the new fiscal conditions, etc. At the same time, the extent of the eco-taxes impact also depends on the scope of their application and the force potential of all the rest of the instruments used to the purpose of achieving sustainable development.

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Especially challenging is the management of the relationship between eco-taxes and competitiveness in international trade. Eco-tax differentiation in individual countries is greater in comparison with the major corporate and personal income taxation. Eco-tax differentiation leaves a strong imprint on the price competitiveness of exports and therefore affects inequitably the companies in countries with higher eco-taxes. This is the reason why the price of a ton of steel in Germany, for instance, contains a much higher tax burden than the price of steel produced in India or China. And this is one of the reasons, which makes German steel more expensive on the international market. The same effect holds true with respect to the export of dozens of product lines, mostly products of the heavy industry, including the chemical industry, metallurgy, and power generation. The impact of these differences is especially acute in the transport sector as well, which – along with power generation – is among the major sources of greenhouse gases.

To avoid the higher eco-taxes and/or to meet the higher environmental standards, the manufacturers in the developed countries prefer to minimize or to eliminate such payments altogether by implementing technologies and products, which lower or even eliminate the hazardous emissions. Businesses in the developed world, which avail of insufficient financial resources to employ such environmentally-friendly technologies, are compelled to relocate their manufacturing facilities mainly in the less developed countries. Sometimes this is the only alternative they have in order to survive. This is the reason why Goldemberg et al. (1996) are right to reach their justified conclusion that the so-called carbon leakage effect can have both upsides and downsides.[1]

The adverse effect is expressed in the fact that the possible exports of "dirty" manufacturing processes from developed to developing countries fails to diminish the overall level of pollution; on the contrary, it can even increase it. In this way, the better price competitiveness of the countries relocating their polluting manufacturing facilities takes place at the expense of the higher externalities sustained by the entire planet. But the higher eco-taxes could also have a positive carbon leakage effect, which is expressed in the shrinking demand for goods, such as oil and natural gas, and the subsequent decline of their prices on the global market. With the declining difference in the price differential between these two energy goods and coal, the demand for the latter in the developing countries will shrink at the expense of the growing demand for oil products and gas. And because the carbon dioxide emissions from coal burning are much higher, the limited demand for coal in developed and developing countries could ensure a certain decline in the overall level of hazardous emissions.

Taxes, especially the excise tax on petroleum products, are among the most widely discussed instruments leading to substantial national price differences of end products and services. It should be emphasized that the excise tax on petroleum-based products targets rather a purely budget effect, i.e. for governments the effect on environmental protection is of a secondary significance. Excise tax revenues are mainly used to solve the problems of countries with their budget deficits and only a negligible portion of these revenues goes to fund environmental programs.

Moreover, in their aspiration to raise national competitiveness certain countries are making attempts to lower the excise duty rates on fuels. The Japanese government voiced such an intention in 2010, but was made to give it up altogether. Such a step could jeopardize the budget revenues of Japan and would respectively hamper the repayment of the record-high government debt of this country (standing at almost 200% of the GDP in 2011). In Japan, the overall amount of eco-tax revenues stands at 3 trillion yens ($ 2.5 billion), and out of it only 76 billion yen ($ 639 million) or merely 25% is used to the purpose of directly funding environmental programs. The rest of the amount is used for road works and maintenance of the road network in the country.[2]

The governments of the majority of the developed countries categorically refuse to raise their eco-taxes on the consumption of solid fuels on the pretext that such a move would adversely affect their economies. The USA never joined the Kyoto Agreement on reducing greenhouse emissions. In Ireland the very idea about introducing such a tax met the shrill response of the business organizations and through their lobbies in Parliament the process was blocked in its nascent state. The arguments were that: a) levying a tax on the consumption of solid fuels would substantially increase their end price, and that b) the result of merely 0.5 millions of tons in terms of lower emissions per annum could not justify such a price increase. In fact, the

[1] Goldemberg, J. et al. (1996) (PDF). Introduction: scope of the assessment. In: Climate Change 1995: Economic and Social Dimensions of Climate Change. Contribution of Working Group III to the Second Assessment Report of the Intergovernmental Panel on Climate Change (J.P. Bruce et al. Eds.), Cambridge, UK: Cambridge University Press;

[2] Miura, J., 2004. Japan: New gas tax ineffective, Yomiuri Shinbun, Sept.10, 2004, Tokyo, accessed at: www.climateark.org/articles/reader.asp?linkid=34851;

calculations and assessments of the Irish government are radically different from those of the majority of the EU member states. What is obvious is that the Irish government is not ready to forgo the short-term economic effects at the expense of the long-term environmental goals.

Evenhandedness requires that we take into account the fact that in principle the United States have set and uphold the goal of lowering their hazardous emissions. But for various economic and political motives they defend the thesis that the same environmental results can be achieved by alternative instruments affecting the environment, including technical standards, trading in emission permits, voluntary agreements between manufacturers and the environmental agencies or institutions, as well as budget subsidies for the development of environmentally-friendly technologies. The counter-arguments pointed out by the US Administration are rather an attempt to employ science-like argumentation in protection of flagrant lobbyist interests. It is thus that the principle of "polluters pay" gets seriously violated. The US economy "produces" a quarter of the global carbon dioxide emissions, and the waste per capita of the US population amounts to 720 kilograms per annum, which is twice as much as the waste generated in Germany and Japan, and about five time more than the same indicator in the developing countries.

Approximately the same ratio is preserved with respect to the so-called "environmental footprint"[1], which for the first time was elaborated and applied by Rees and Wackernagel (1996).[2] We can take it as a reliable indicator for the fiscal accountability of individual countries. Under equal other conditions, the bigger environmental footprint suggests a larger base for the implementation of a relevant system of eco-taxes and adequate mechanisms for the re-distribution of a portion of these tax revenues in favor of the countries, which enjoy a more favorable "environmental balance sheet". The latter means that in fact the arable productive land in the developing countries is used to secure a national consumption, which is several times bigger and results in the generation of larger quantities of waste and pollutants than the industrially developed countries generate.

Thus for instance, in 2007 the environmental footprint for the USA was 9 gha, for Switzerland 5.6 gha, and 1.8 gha for China. For the sake of comparison, the Footprint of the entire humanity was 18 billion gha, or 2.7 gha per person. WWF estimations in 2007 showed that the Earth's bio-capacity was only 11.9 billion gha, or 1.8 gha per person. This represents an ecological overshoot of 50 per cent. This means that it would take 1.5 years for the Earth to regenerate the renewable resources, which people used in 2007 and to absorb the $CO_2$ waste.[3] Consequently, the environmental unbalance has gone so far that if we take into account the externalities in the process of production, the short-term loss of competitiveness stemming from the implementation of the eco-taxes is times smaller than the long-term benefits for companies and society.

## Adverse consequences for competitiveness

Hoerner and Muller (1996) offer a system of criteria, which can be used to assess the measures for overcoming the possible adverse consequences for competitiveness, which are observed as a result of implementing eco-taxes on a broader basis. In the opinion of the two authors, these measures are as follows: a) effectiveness; b) incentives for the preservation of the environment; c) manageability; d) equality; and e) the amount of lost incomes.[4] In my opinion, these criteria should be closely linked to the end environmental and social effect. For instance, in order to assess the environmental impact, not only the foregone tax incomes should be measured, but also the saved budget expenditures owing to the lower level of pollution attained. If a specific policy is pursued, it is thus quite possible to attain a bigger lowering of the budget expenditures spent on restoring the environment in comparison with the diminished tax revenues.

[1] "The environmental footprint" indicates the size and volume of environmentally productive land and water areas, which a given unit of the population needs (in thousands, millions, etc.), in order to secure its own consumption, alongside the area needed for dumping the waste products of industrial processes and those generated from their consumption.

[2] Rees, W. and Wackernagel, M., 1996. Our Ecological Footprint –Reducing Human Impact on the Earth, New Society Publishers, BC, Canada;

[3] Living Planet report 2010: Biodiversity, Biocapacity and Development. WWF (2010), p.34;

[4] Hoerner, J. and Muller, Fr. Carbon Taxes for Climate Protection in a Competitive World. A paper prepared for the Swiss Federal Office for Foreign Economic Affairs by the Environmental Tax Program of the Center for Global Change, University of Maryland, College Park, June 1996, p.18, accessed at: www.sustainableeconomy.org/swiss.pdf;

In such a case, the net effect on the budget will be favorable. Such an approach could release funds for the expansion of environmental programs or for additional funding of programs of a social trust.

It would be expedient to add a yet another criterion to the system, namely: the social effect obtained from the various compensatory mechanisms. The higher cost for the taxpayers – for the maintenance of the necessary administration, for instance – can be offset by opening new jobs in result of implementing such eco-taxes. Another important social effect stemming from the abated environmental pollution is people's health and the lower costs spent on healthcare. Besides, the principled approach concerning tax neutrality means that eco-taxes will be offset by lower taxes on labor and capital. The latter means more investments and higher demand for respective workforce, and consequently – growing incomes for the households. Therefore, the additional criteria suggested in this study would make it possible to assess the environmental and social effects of the Environmental Tax Reform (sometimes known as the green fiscal reform as well) in a more comprehensive manner, thus gaining a better insight of its impact on market competitiveness at the same time.

The arguments in defense of the thesis that the possible implementation of an eco-tax would curb the purchasing power of households, which would shrink the aggregate demand and in its turn would slow down the growth rates of the economy, are insufficiently substantiated. These pessimistic expectations have no justification whatsoever, if we take into account the premise postulating that environmental legislation must be neutral with respect to the overall taxation level. What is recommended is that the introduction of a new eco-tax should be accompanied by a relevant decrease of taxes on the other two factors of production, namely: capital and labor. The purpose is to attain a specific, well-defined, and targeted effect by means of restructuring the entire taxation system without increasing the overall tax burden. In this way, the "double effect" can be interpreted from another point of view as well – as a simultaneous decrease of both pollution and the overall costs for the implementation of the taxation policy.

A study published by the European Commission makes the conclusion that the introduction of higher taxes on energy supply, nitrogen oxides, water supply, wasting water, pesticides, fertilizers, packaging, motor vehicle batteries, etc., will have a negligible or even no effect on the competitiveness of the EU companies.[1] The reason why is that the new or higher eco-taxes are offset by lower corporate taxes, lower personal income taxes, as well as lower social security contributions. Thus for instance, if the minimum tax rate on the emissions from a ton of carbon dioxide is increased to EUR 15, the price of coal will go up, but the overall macro-economic effect will be sufficiently low.

By means of their econometric analysis Parry and Bento (1999) have proven that the optimal eco-taxes can generate in fact an additional social and economic effect when taxation is lowered in economic sectors where the taxes on labor distort the relative prices of various groups of consumer goods. The elimination or at least the decrease of these distortions helps consumers make a more rational choice of goods and consequently leads to a more rational consumer behavior. The thesis of the two authors that such an effect is especially strong when it concerns ratios between relative prices of consumer goods and services, the production of which is connected with different intensities of polluting the environment, but it is quite acceptable.[2]

Much like any other instrument of economic policy, eco-taxes can bring about short-term problems in certain sectors of the economy or for an individual group of companies. Businesses in a dire financial state at the time of introducing the new taxes merit special attention. I share the consideration launched by Sterner (1994) that the Pigou (or Pigovian) tax presupposes a tax level, which makes it possible to lower marginal costs to the permitted level of pollution. These can even prove to be below the level of the actual costs made by companies in a difficult financial situation. In other words, the new tax could contribute to their insolvency and failure. This is the reason why the implementation of the new tax would be unacceptable from a political point of view.[3] Therefore, for certain companies and under certain conditions, what is preferable is the employment of traded emission permits, as this system would be devoid of such a direct impact on the financial state of businesses.

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[1] European Commission. (2004). Study on the economic and environmental implications of the use of environmental taxes and charges in the European Union and its member states (DG TAXUD C5), accessed at: http://europa.eu.int/comm/environment/enveco/taxation/environmental_taxes.htm;

[2] Parry, I. and Bento, Ant. Tax Deductible Spending, Environmental Policy, and the "Double Dividend" Hypothesis, Discussion Paper 99-24, Resources for the Future, Washington DC, February 1999, pp.3-7, accessed at: http://www.rff.org;

[3] Sterner, Th. Policy instruments for a Sustainable Economy, in: Economic Policies for Sustainable Development, Ed. By Thomas Sterner, Ch.1, p.12, Kluwer Academic Publishers, The Netherlands, 1994;

Owing to the neutral nature of the eco-tax reform, when companies start paying up such a tax, their return on investments or their profit margin does not decline, as the social security contribution rate for their workers or their corporate profit tax will decline at the same time. The same approach is used to balance the tax burden, which is transferred to the consumers in result of the fact that the introduction or increase of the eco-taxes on consumer products also raises their market value.

The combination of lower taxes on capital and household incomes and/or the decrease of other direct and indirect taxes can neutralize this undesirable effect. This is the reason why the Environmental Tax Reform (ETR) is defined as neutral with respect to taxation. Without altering the tax burden, countries can achieve a targeted effect expressed in the modification of the way entrepreneurs and consumers behave, which makes both production and consumption environmentally friendly.

The results of the ETR, which has been implemented in several European countries including Norway, Denmark, and Sweden, have categorically confirmed these expectations. Undoubtedly, the principle of tax neutrality has been the preliminary condition for gaining the broad political support of voters and business for the implementation of such taxation, inasmuch as tax policy has always been in the focus of the electoral process. Whatever happens, a given reform in the taxation legislation can take place only within the legislative body of a specific country or at the European Parliament with respect to the EU member states. The political dimensions of the problem are the main reason for the existing differences between individual countries and for the unwillingness demonstrated by some of them to initiate the indispensable Environmental Tax Reform.

When analyzing the advantages and risks of implementing the ETR, we should keep in mind the existence of the so-called “double dividend” The first effect concerns the mitigation of the damages incurred to the environment, and the second – the implementation of environmentally-friendly and non-polluting technologies, which as a rule are more productive, since they are less energy- and material-intensive. In the medium and especially in the longer term, this definitely raises their market competitiveness. There is a yet another indirect effect that must be added to the direct one, namely: the manufacturers would make savings by paying lower eco-taxes, fees, charges, and fines, or they would even pay no such costs altogether. The “dividend” effect will be similar on the national level as well, where the fiscal commitments of the country to pay possible international taxes would be lower.

The realization of this “double dividend” effect is achieved in result of pursuing an active fiscal policy by means of direct and indirect subsidies channeled into the process of introducing environmentally-friendly technologies and products. The instruments and fiscal techniques employed are of a most varied nature and *inter alia* include: a) the recycling (partial or as a whole) of the revenues raised from energy or other eco-taxes in favor of the companies subject to such taxation; b) funding of national or corporate research and development projects of an environmental orientation and of expected positive effects from the government budget; c) disbursement of export bonuses for the exports of environmentally-friendly products or products manufactured by environmentally-friendly technologies; d) subsidies for production facilities, which are reorganizing their energy supply by using alternative energy sources and/or are restructuring their raw-material supply from non-renewable to renewable resources.

The strong fluctuations of oil and oil product prices indicate that the possible implementation or increase of the eco-tax on production and consumption will have a negligible overall effect on price formation. In 1998, crude oil prices equaled the 1974 oil prices, while in 2007 they were almost six times higher than the 1998 and 1947 prices respectively. Hence, the claims that a possible increase or a modification of the eco-taxes levied on the production and consumption of oil products would impact the price competitiveness are completely unsubstantiated. Modifications in the tax rates of several percentage points are hundred times smaller than the oil price fluctuations during the past decade. It goes without saying that a tax increase would hardly impact the demand elasticity of oil. But it would certainly increase the revenues from these taxes and would respectively secure the financial funds needed to develop adequate environmental programs on both the state and corporate levels.

It would be interesting to make a comparative analysis of the tax rates on some of the oil products, such as unleaded gasoline, for instance, which have a dominant market share. The possible implementation of a “universal tax rate” would produce a varied tax effect, both with respect to the tax burden sustained by companies and the magnitude of government budget revenues. In both cases this would have a different impact on the tax policy effects. The prices of unleaded gasoline are quite different in the USA, the EU, or Japan. There are substantial differences in this respect among the EU member states as well. It is because of these differences that a tax of the same magnitude would result in a different increase of the market price of this unleaded gasoline and would produce a different effect on its price competitiveness respectively. Given the current ratio between these prices, an additional one percent tax on unleaded gaso-

line under equal other conditions would mean a 3.5 US cent appreciation in the United States, and only about 1 Euro cent appreciation in the European countries. What is more important in this case, however, is that the relative prices will be preserved. We can assume that in principle the implementation of this tax should not modify the relative prices of this product, as this would bring about additional difficulties in the process of reaching international agreements.

A possible solution to the problem with the contradiction concerning the universal or single rate and the preservation of the relative prices is to implement this tax as an absolute magnitude – for instance, one or two cents per liter. Although the percentage rise of the product price would be different as long as the taxation price base is different, the absolute amount of the additional tax burden will be preserved with respect to all countries. And it is precisely the absolute amount of the additional tax that has a bearing upon the price competitiveness. The above example also shows that the implementation of such a minimal additional tax of 0.5 or 1 percent, or 1 US or Euro cent, has an insignificant effect on the product price in comparison with the other price factors.

In the course of six months only, the price of unleaded gasoline in the USA increased by 7 US cents or 20%, in Poland – by 12 cents or 15%, and so on. For the period of 1998 – 2007, the price of crude oil fluctuated from around US$ 13 per barrel to almost US$ 80 per barrel or the price fluctuations were within the limits of 600%! Therefore, the claim that one percent additional tax would make the price of petroleum products far too high is unacceptable on the background of these fluctuations.

The cumulative tax (excise duty plus the VAT) is one of the major factors underlying the differences in the relative price of gasoline in the individual countries. The data from Figure 1 indicate the dramatic difference in tax levels between the OECD member countries and Bulgaria. In the USA, this tax is merely symbolic. The tax ratio between the United Kingdom and the USA stands at 18:1! Similar is the ratio between the Netherlands and the USA, or between the USA and the Nordic countries. Even in the East European countries, such as Poland, Hungary and Bulgaria, taxes on unleaded gasoline are 6 to 8 times higher than the same tax in the USA. These differences not only give unilateral advantage to US exports and respectively make US companies more competitive on their own market; what is more important is the undesirable environmental effect that this situation produces, because by means of this low tax the USA encourages the consumption of petroleum products. The higher rate of consumption of liquid fuels not only pollutes the natural environment in the USA, but also becomes one of the factors contributing to the global warming, the consequences of which have to be borne by the entire planet.

The price differentiation of gasoline in the various countries only confirms the need for raising the tax on fuels in the USA. Despite the fact that the gasoline price in the USA is 2 to 3 times lower than that in the EU, Japan, and China, the US trade balance with these same countries has chronically been adverse. This suggests that the price differences of this strategic raw material, which has a direct bearing upon the entire price system, plays only a secondary role with respect to other price factors. Consequently, the objections of the USA and their concerns that the Environmental Tax Reform would harm their economic interests are not founded on any convincing proofs.

## Inconclusive arguments of the neo-conservatives

It can also be expected that such an insignificant price change would impact only slightly the behavior of producers and consumers, i.e. the supply elasticity of these products and their demand would not mark any tangible alteration. But the implementation of this tax will secure significant budget resources to fund both environmental programs and tax reductions of corporate profits and household incomes.

It is usual for countries pursuing a neo-conservative or neo-classical economic policy to resist the implementation of this new tax. For them any tax increase is unacceptable and contradicts the principle of the "smaller government" in a market economy. Despite such resistance, the problem with the harmonization of tax legislations cannot be underestimated. This is an extremely complicated issue and obviously requires a stepwise and phased-in solution, which takes into account the specificity of the individual countries. The fact that only a few of the EU member states have been bold enough to undertake this step suggests that it will take a long time for all to join in.

The concerns about the loss of price competitiveness can be dispelled by the introduction of certain accompanying fiscal and trade measures, which could make this process acceptable for all the countries. The opportunities I see for the solution of this issue involve the mechanisms of the World Trade Organization, which regulate the conditions of effecting international trade.

In my opinion, there is a possible option, whereby each import country will get the right to impose a targeted environmental tax (an eco-tax) on imported products to the amount of the possible difference between a similar tax in the import country and in the export country respectively. There are sufficiently reliable calculations, which indicate the extent of product change from the various sectors manufacturing goods and services as a result of each unit change in the price of oil or the other non-renewable natural resources.

Hoerner (1999) calls this equalizing price mechanism Border Tax Adjustment in Environmental Taxation, or BTA for short. This mechanism determines the choice of the entity that will be subject to taxation (producer or consumer) depending on the place where taxes are deducted – i.e. either the producer or the buyer will be taxed. In the former case, this equalizing taxation mechanism has to be introduced for the consumption taxes, and in the latter case – the mechanism will concern the taxes levied on production.[1]

Certain particularities concerning the way international deals are realized should be kept in mind here. The most simplified case is the direct bilateral trade where the above said equalizing price mechanism will be easiest to introduce. A considerable portion of international trade, however, takes place by means of intermediaries and in the form of re-export. It would not be acceptable to collect the equalizing taxes from the intermediating countries. The issue is especially sensitive when the trade turnover takes place within a regional customs union or another kind of an international grouping, such as the EU, NAFTA, ASEAN, etc. Imports can come through one of the member countries, where a distribution center is located, and be subsequently redistributed to their final destinations.

It would not be acceptable for such an imports-distributing country to benefit from the import taxes alone, because it is highly probable for the entire quantity or at least the larger part of imported goods to be redistributed among the other partner countries. These substantial differences in the very mechanism of carrying out trade presuppose the presence of an adequate solution, which, on one hand, helps the realization of the principle of equalizing the burdens of eco-taxes, and on the other, harmonizes the fiscal interests of the producers and the end users or consumers.

It is necessary for the collection of this eco-tax to be organized not only on a bilateral basis, but on a regional and international basis as well. The regional mechanism can be applied relatively easily, because these customs unions and integration groupings already have in place special taxation structures of their own, which administer the import-export trade regime. The establishment of such a mechanism at the level of the World Trade Organization (WTO) will take more efforts and probably more time.

The WTO and the individual member countries have a sufficient amount of experience and qualified personnel to be capable of solving this issue from a methodological and factual point of view. The employment of such an equalizing fiscal mechanism could neutralize the problem with the impact on competitiveness brought about by any eco-tax. Such an approach has long been used as a counter-measure on the part of importing countries when the exporting country directly or indirectly subsidizes certain commodity groups. At the time being, such equalizing mechanisms are applied for certain metallurgical goods and agricultural produce.

There are different possible options for the distribution and utilization of the income from this “offsetting” tax rate on the imported goods and services, which are not levied with such an eco-tax in the exporting country. This eliminates the problem with the unfavorable competitive position. The importing country has a vested interest in applying this mechanism, because in this way it not only protects its own producers, but also provides for itself additional budget revenues. The administrative costs involved with the implementation of this system will be – as usual – within the limits of 4 to 6 percent out of the total amount of revenues. Thus the exporting country will also be under the impact of these same economic incentives, prompting it to organize the collection of the eco-tax under its own jurisdiction instead of surrendering the fiscal benefits to its trade partners.

How should one proceed if the two countries (exporter and importer) have failed to introduce any effective eco-tax? There are two practical solutions to this issue: a) the offsetting tax is applied regardless of the status of the countries, or b) a certain percentage of the revenues is redistributed in favor of a specialized WTO fund or some other international agency, which will be authorized with the rights to manage these funds. I assume that it would be more expedient to make use of the existing international institutions instead of establishing new administrations, as this would take more time and will be more expensive. The

[1] Hoerner, A. (1998).The Role of Border Tax Adjustment in Environmental Taxation: Theory and U.S. Experience. Working paper, presented at the International Workshop on Market Based Instruments and International Trade of the Institute for Environmental Studies, Amsterdam, the Netherlands, March 19th, 1998, pp.4-5 ;

implementation of the equalizing mechanism in this way would counter possible attempts to benefit national producers by means of recycling these eco-tax revenues in their favor.

Finding a solution to the above mentioned problem would be quite feasible, should international legal limitations be introduced on the employment of such recycling fiscal mechanisms. I am convinced that the implementation of such a mechanism would render pointless the current objections on the part of countries such as the USA, the United Kingdom, Ireland, Japan, etc., to the effect that the introduction of universal and comprehensive eco-taxes, including taxes on the electricity supply and carbon dioxide emissions, would undermine their competitiveness. It is only logical to assume that certain countries could lower other taxes to the purpose of preserving their export prices. But this could hardly be automatically applied, because these fiscal revenues have already been bound with other budget allocations. Moreover, in the worst case scenario, specialized funds could be set up, which would only be used for targeted environmental and social programs.

There is also an alternative option conducive to solving the possible adverse effect of eco-taxes on national competitiveness. This is the opportunity to use price differences in order to diminish the hazardous emissions – carbon dioxide, for instance – both in the developed and in the developing countries. What is necessary is to assume that the commitments of a given country to lower hazardous emissions (carbon dioxide in the particular case) to the tune of a fixed volume of physical units (in thousands or millions of metric tons), can be met both by curbing such emissions in this same country or doing so in another country. The condition is for the former country to have directly contributed to lowering carbon dioxide emissions (or any other pollutant for that matter) by funding this process, or by submitting respective technologies and facilities, know-how and managerial experience to another country.

There would be no problem if the assistance granted should come in the form of maintaining and enlarging the areas covered by forests, i.e. if the efforts are channeled into increasing the capacity of nature to absorb carbon dioxide. The process of determining the countries eligible for such assistance by all means should take place in conditions of international coordination. This is necessitated by the fact that the degree of pollution at present is different in the various geographical regions. Such regionalization should also be borne in mind in the process of determining the possible need for carrying out a forestation on a grander scale.

The economic assessment of various activities and the verification of the price levels of the necessary goods and services will be in conformity with the market principle. This will be facilitated by the fact that the specified groups of goods and services are present on the international market and their prices are public. Thus for instance, it may prove more economically beneficial for Denmark to invest its funds in the preservation of the tropical rain forests in Brazil instead of spending funds on curbing its own carbon dioxide emissions. What should be done is simply to compare the costs for curbing the emission of a million tons of greenhouse gases in Denmark with the costs for preserving the respective forest area, which could guarantee the absorption of the same million tons of greenhouse gases. Or instead of imposing new or additional eco-taxes on polluters, the country could meet its commitments stemming from the Kyoto Protocol by allocating a portion of its budget expenditures for international environmental programs. This approach should be subject to mandatory assessment and control on the part of an authorized international body or a specialized department of the existing international organizations.

## Compensating mechanism

In order to minimize the problems with the adverse effect on the competitiveness of individual countries, the introduction of an environmentally expedient fiscal policy must be as broad and comprehensible as possible, i.e. it must encompass all the member countries of the United Nations Organization. It is another matter that for a number of reasons the level of implementation of such fiscal measures and their specific instruments and relative weights will vary. The application of common principles in these approaches does not rule out a certain amount of flexibility in the forms and methods of their implementation depending on the actual volume of emitted pollutants, the current state of the environment or the degree of social polarization, the structure of the economy, the dependency on international markets, the structure and volume of exports and imports, the availability of natural resources, etc.

If the industrialized countries, Russia and the rest of the East European counties included, are responsible for three quarters of the global greenhouse gas emissions, then they should play a leading role in the implementation of an adequate fiscal policy, which could bring about the gradual abatement of such emissions both in terms of their absolute volume and per capita of the population. The fact that the Environ-

mental Tax Reform is now in place in the most developed industrialized countries – mainly within the European Union – is highly commendable.

In 2005, *The Economist* published encouraging data about the positive effect obtained from the tax relief measures concerning the use of alternative renewable energy sources.[1] The so-called "bio-fuel" is among these alternative sources.[2] The US tax credit amounts to 10.5 Euro cents per liter, plus another 8 to 15 Euro cents for each gallon of bio-fuel manufactured by small producers (i.e. companies turning out up to 30 million gallons per annum). Besides, individual states, such as Illinois, Missouri, and North Dakota, grant an additional tax credit to the tune of about 10 – 15 Euro cents per gallon of bio-fuel[3].

These tax credits for each "bio-liter" of liquid fuel are much higher in the European Union where they reach up to 47 Euro cents in Germany, 40 Euro cents in Italy, 33 Euro cents in France, and 29 Euro cents in the United Kingdom and Spain. As a result of this taxation policy, France expected to treble its production of ethanol and bio-diesel by 2007. The German bio-diesel production has been growing by almost 50% per annum, while the US ethanol production has been rising by 30% per annum. This is an excellent example of an adequate fiscal policy, which opens the way to sustainable development. Moreover, the encouragement of bio-fuel consumption increases the competitiveness of the countries, which apply such incentives.

This can be explained with the fact that this liquid bio-fuel is cheaper and its consumption makes the countries using it more independent from the imports of energy resources, which is coupled with a host of other economic, social, and political advantages stemming from it. However, the indirect subsidizing of the production and consumption of environmentally-friendly energy sources is still at a rather low level in terms of its relative share in comparison with the direct and indirect subsidies channeled to other activities, and it is the latter that underlie the lacking sustainability of economic development.

The utilization of bio-fuels as substitutes to the traditional energy sources is far from being problem-free. The comprehensive and complex economic analysis shows that under certain conditions this alternative may prove unfavorable from an economic and social point of view. Besides, certain studies come to the conclusion that the expectations for lowering hazardous emissions due to bio-fuel use have been unjustifiably overrated. Thus for instance, a study held by the OECD and published in September 2007 indicates that even in accordance with the most optimistic scenario, the extended use of bio-fuels would decrease carbon dioxide emissions by only 3% within the period spanning up to 2050.[4] Calculations show that bio-fuels will retain their low price competitiveness vis-à-vis the "classical" petroleum products – gasoline, diesel, propane-butane, and also with respect to methane. Therefore, it will take substantial budget subsidies in order to achieve the desired competitive price levels of bio-fuels and impose them on the market, as these subsidies will have to cover a certain portion of the manufacturing costs and to guarantee at the same a sufficient level of return on investments.

The fiscal policy for sustainable development in Eastern Europe to a certain extent represents the implementation of the actual multi-lateral agreements reached at the "Sofia Initiative" concerning the broad implementation of economic instruments for sustainable development in the countries in transition.[5] Klar-

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[1] The Economist. Special report: Biofuels. (2005, May 14), pp.71-73;

[2] Bio-fuels are based on the release of chemical energy in the process of degrading domestic waste, industrial waste, and agricultural produce and waste, as well as from processing renewable energy sources, such as wood. According to Wikipedia, bio-fuel ensures 15% of the global energy consumption, whereby this share is the highest in the developing world. But certain developed countries, such as Sweden and Finland for instance, also mark a high share of bio-fuels in their energy sectors – 17.5 and 19 % respectively. The utilization of waste materials for energy generation has a multiplication effect, because apart from the low or zero level of polluting the environment, it makes it possible for other problems to be solved as well, including the benefits of generating additional income from the repeated use and recycling of waste.

[3] A US gallon of gasoline equals 3.785 liters.

[4] OECD blasts EU biofuels rush, **EurActiv 11/01/07**, **accessed at: http://www.euractiv.com/en/transport/oecd-blasts-eu-biofuels-rush/article-166628;**

[5] The name of the "Sofia Initiative" for implementing economic instruments was given by the International Environmental Protection Conference held in 1995 in Sofia, the capital city of Bulgaria. Participants in the conference were ministers of the environment from the European Union, the USA, Canada, and the East European countries in transition, including the Commonwealth of Independent States (i.e. the member countries of the former Soviet Union). The participants came to an agreement on the set of economic instruments and the mechanism for their implementation. For more than a decade now, the decisions of the "Sofia Initiative" are accepted as criteria for measuring the achievements made thus far. For further details see: Sofia Initiatives on Economic Instruments, от: http://www.rec.org/REC/Programs/SofiaInitiatives/EcoInstruments/EI.shtml

er et al. (1999) from the Regional Environmental Center for Central and Eastern Europe define the utilization of these instruments to the purpose of sustainable development as a condition *sine-qua-non* in the process of transition to a developed market economy and full-fledged EU membership.[1]

In their study Ark and Piatkowski (2004) analyze two possible alternatives for the newly acceded EU member countries. The first one is based on the "convergence hypothesis", and the second one concerns the "deviation" from the structural development of the then 15 EU member states.[2] The first hypothesis presupposes the adequate restructuring of the economies of the newly acceded EU member countries and the gradual offsetting the consequences of their lagging behind with respect to the competitiveness indicator. It is based on the opportunity for them to outstrip the development of the science-intensive sectors of their economy and to implement novel technologies and products respectively. The second hypothesis describes a scenario, whereby the technological rift is getting increasingly deeper in case the manufacturing structure of these countries would be preserved and should the developed EU countries start using the former socialist countries in the capacity of a "backyard" for manufacturing processes of low investment return and/or production activities, which pollute the environment. This usually takes place through privatization and expansion of existing manufacturing activities.

In other cases, what simply happens is the opening of markets for precisely such manufactured products, whereby, on one hand, the imports of necessary goods to the host country are provided for, and on the other – the exporting country avoids the undesirable environmental and social effects. Such an unfavorable example for Bulgarians is the fate of the "Kremikovtzi" Metallurgical Combine Works. Despite its privatization, it remained a national problem for a long time owing to several significant reasons, among which: the large number of workers employed in the various production sites, the strong interconnectedness with hundreds of other small- and medium-size businesses acting in the capacity of sub-contractors, the import-substitution metal production, the sizeable volume of its social product, its considerable money turnover, etc. At the same time, this company was the biggest polluter of air, soils, and waters in the Sofia Valley. The pollution was also of a trans-regional nature and by means of air and water flows the pollutants were dispersed over broader areas of the country. The regular measurements often indicated a level of pollution exceeding several times the European standards.

The failure to meet the commitments pledged before the European Commission for a stepwise and phased-in abatement of pollution to the maximum levels permitted entails substantial financial sanctions imposed on the country, including also the option for revoking the manufacturing license of the polluting enterprise. Such a development would have significant economic and social consequences in the short- and medium-term period of time. The above example proves the need for a long-range basis of the public-private initiative in the process of resolving such environmental problems. On one hand, this will optimize the ratio between additional costs and the level of competitiveness, and on the other – it will guarantee that the preservation and even the increase of competitiveness will fully correspond to the criteria for sustainable development.

## Conclusion

Greening economy can be and must be a springboard for better market positioning, increasing investment return and stronger competitiveness. For instance, the energy and raw materials saving technologies combined with the "closed cycle" approach simultaneously eliminate or at least minimize the harmful emissions and improve the cost effectiveness. The scope of this "win-win scenario" could be substantially extended if appropriate eco-fiscal measures were applied. The step by step harmonization of the eco-fiscal policies will help for the equalization of the foreign trade conditions. It is a very difficult task because the harmonization supposes some compromises with the national sovereignty though, by my perspective, it pays the price.

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# ENVIRONMENTAL DIMENSION OF SUSTAINABLE TRANSPORT DEVELOPMENT

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**Abstract**

*The environment is now very close to the top of the political agenda in many countries. There is a widespread consensus that progress towards sustainable development is essential. However, there is considerable debate as to what this term means. One particular part of this debate concerns the role of transport as major consumers of energy and generator of pollution. The question is: can transport activity be planned in such a way as to be more energy-efficient?*

*This paper explores the indicators and measures toward environmentally sustainable transport, with particular emphasis on the energy consumption and greenhouse gas emissions which prevent the achievement of policy objectives of reconciling the economic interests of the transport sector with environmental constraints. Several arguments substantiated by empirical evidence from EU countries are put forward to demonstrate that current megatrends in transport are at odds with a sustainable development and lead to high social costs. A variety of policy strategies is discussed to improve the current threatening situation.*

*The various paragraphs of this paper concentrate on the real problems which environmental performance of transport present to policy-makers and assess the contribution that the analysis can make to handling more effectively environmental considerations in transport decision making. Previously, environmental concerns in transport have been mainly restricted to local factors such as noise, severance and visual intrusion, but recent concerns over global warming, acid rains and a range of pollution-induced diseases have given importance to regional, national and global implications and environmental degradation.*

*The aim of this paper is to provide a general background against which the new research may be set. It does not aim either to be comprehensive in its treatment of environmental policy and transport or to provide answers o the questions that it or its paragraphs raise. It is hoped, however, that it may flag some of the key issues where uncertainty remains and where subsequent research could prove beneficial.*

**JEL code:** D62 Externalities; F15- Economic integration; L91 Transportation: General
**Key words:** sustainable transport, environmental performance, energy consumption, greenhouse gases

## Introduction

The growth of transport activity raises concerns for its environmental sustainability. Transport systems are major emitters of greenhouse gases (GHG)[1]. Currently 95% of transport energy comes from petroleum, although electric trams and trains are also common and natural gas is used as well. Internationally, biofuels are forecast to have little or no impact on greenhouse emissions, at significantly higher cost than energy efficiency measures (Munasinghe, 1993). Electric vehicles are another technology which has the potential to reduce transport $CO_2$ emissions, depending on the embodied energy of the vehicle and the source of the electricity.

The environmental impacts of transport can be reduced by improving the walking and cycling environment in the cities, and by enhancing the role of public transport, especially electric railways. The most

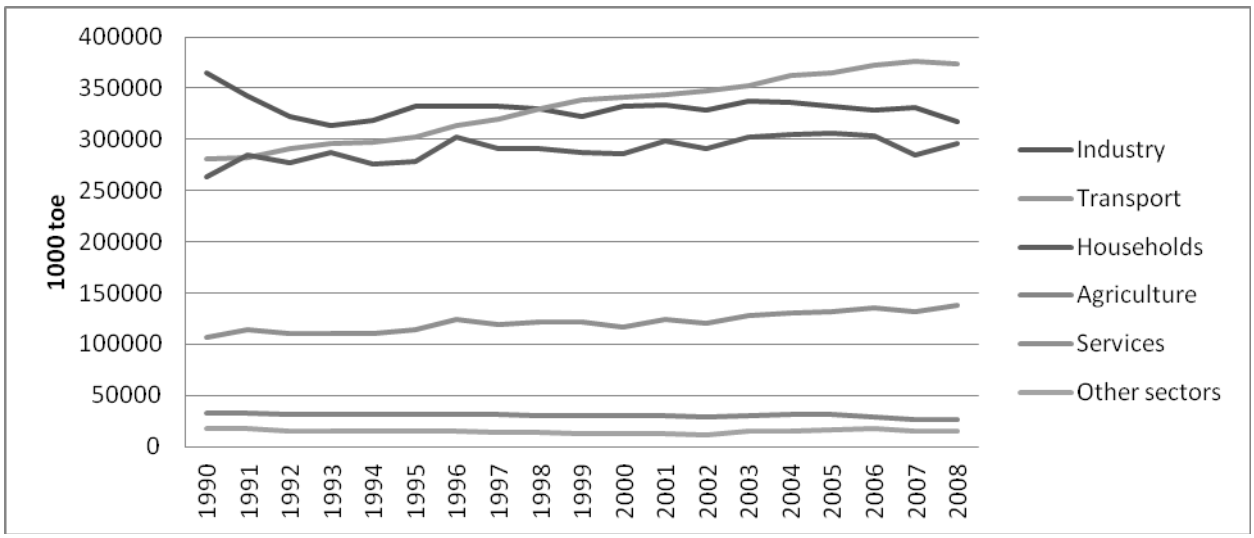
[1] **GHG - Greenhouse gases** are gases in an atmosphere that absorb and emit radiation within the thermal infrared range. This process is the fundamental cause of the greenhouse effect. The main greenhouse gases in the Earth's atmosphere are water vapour, carbon dioxide, methane, nitrous oxide, and ozone

popular forms of green transport, providing a way of sustainable mobility are walking, bicycling and so-called green vehicles[1]. Green vehicles also include:

- Solar vehicles - not practical day-to-day transportation devices at present, but are primarily demonstration vehicles and engineering exercises, often sponsored by government agencies;
- Wind-powered electric vehicles;
- Electric cars - currently, in most cases, electrical power is derived from battery packs carried on board the vehicle;
- Hybrid vehicles; and
- Electric trains and electric buses.

***FINAL ENERGY CONSUMTION OF TRANSPORT IN EU***

Final energy consumption covers all forms of energy, as they are delivered to the final consumers (industry, transport, households and other sectors), for all energy uses. Data on figure 12 show the quantities of fuel consumed in the EU-27, expressed in tons of oil equivalent (toe).



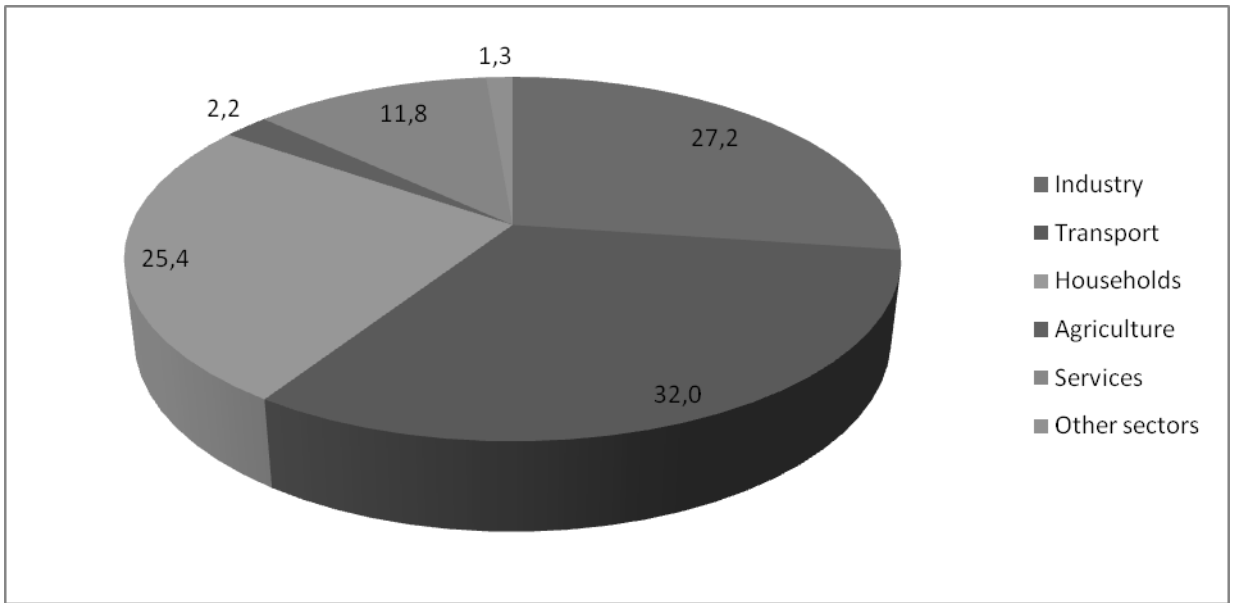

**Source:** EUROSTAT, 2010

**Figure 1.** Final Energy Consumption - EU27, by sector

The final energy consumption of the EU-27 transport sector amounted to 374.2 million toe in 2008. It made up somewhat around one third (32 %) of total final energy consumption (Figure 13), a share which rose from 26.3 % in 1990. This is due to transport's energy consumption growing at an average annual rate of 1.8 % from 1990 to 2008, while energy consumption in industry was reduced. Transport accounted for 83 % of the 108.6 million toe increase in total final energy consumption from 1990 to 2008.

Growing fleets of passenger and goods road vehicles with higher performances, and a strong increase in the provision of air transport services in the reviewed period were the main contributors to the higher energy consumption of the transport sector.

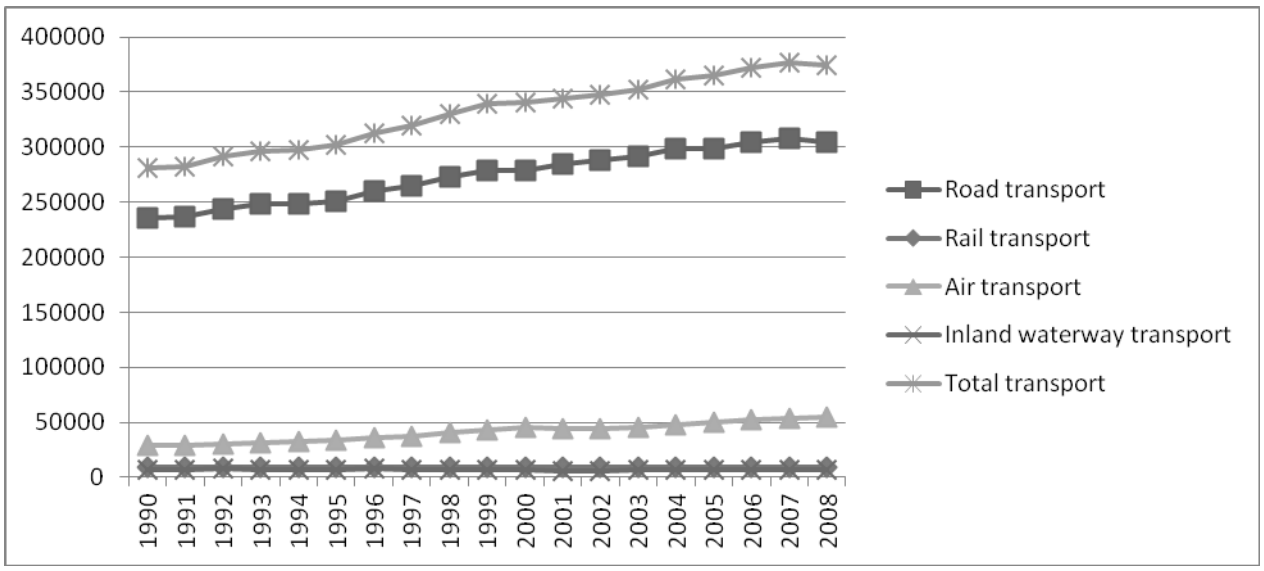
[1] They are significantly less harmful to the environment than comparable conventional vehicles. Presently, the term "green vehicle" is used for any vehicle surpassing the Euro 6 - norm, and also more informally to California's zero emissions vehicles and other low-carbon emission vehicles.




**Source:** EUROSTAT, 2010

**Figure 2.** Final energy consumption by sector, 2008

Road transport is the mode consuming most energy in the EU-27 (figure 14). From 1990 to 2008, the final energy consumption of road transport grew at an annual rate of 1.6 %, to reach 304.2 million toe in 2008, which amounted to 25.8 % of total final energy consumption, and to 81.3 % of consumption in transport.




**Source:** EUROSTAT, 2010

**Figure 3.** Final energy consumption by mode of transport

According to data from a recent EUROSTAT publication[1], private cars accounted for 55.9 % and lorries for 39.4 % of total energy consumption in road transport. Road freight transport also saw progress as it consumed 66 toe per million tkm.

Rail made up 2.5 % of final energy consumption in transport in 2008 compared to 3.4 % in 1990. While energy consumption by rail was close to unchanged in 2004 compared to 1990, (both years: 9.6 million toe), it fell thereafter to reach 9.3 million toe in 2008. This is due to reductions in rolling stock. Given 1 % yearly increases in rail passenger and freight transport performance over the period, energy efficiency gains may be expected to have been made, with for example electric-power replacing diesel oil.

[1] EUROSTAT, Panorama of Transport, 2010.

Inland navigation was the transport mode that consumed least energy in 2008 (6,5 million toe) when it made up 1.7 % of total transport energy consumption. From 1990 to 2008, energy consumption by inland navigation fell at an average yearly rate of 1.0 %. While vessel numbers have decreased, their performance has tended to grow, also pointing at energy efficiency gains.

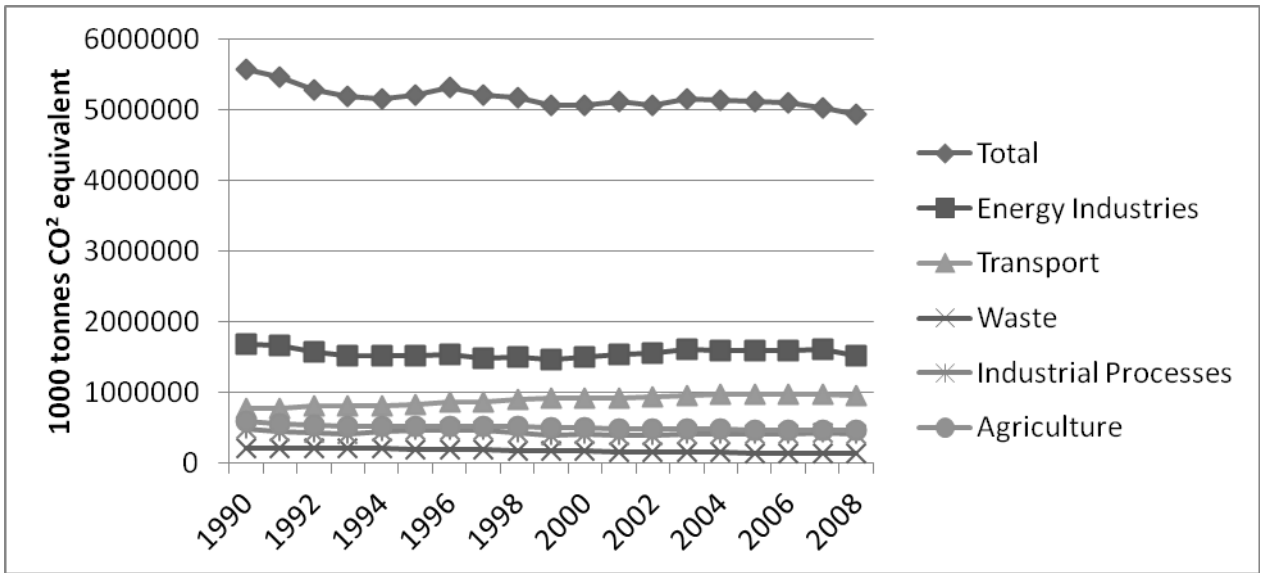
The final energy consumption of air transport increased throughout the period, except between 2000 and 2002. It raised from 29.1 million toe in 1990 to 54.3 million toe in 2008, at an average annual rate of 3.7 %, the highest rate among the four transport modes covered. The share of air transport in final energy consumption increased from 10.4 % in 1990 to 14.5 % in 2008. Through the improved design of aircrafts and engines, and through higher passenger and freight loads, air transport may be expected to have made noticeable energy efficiency gains measured in toe per pkm.

In the coming decades, oil and other fossil fuels are expected to become more expensive as demand increases and low-cost sources dry up. The negative impact on the environment will be greater, as conventional sources are replaced by more polluting supplies. At the same time, the need to move to a low-carbon economy and the growing concerns about energy security will bring about a greater supply of renewable energy, made much cheaper by technological progress and mass production.

Nearly the entire energy consumption of the EU-27 transport sector consists of hydrocarbon fuels. In yielding their performance, transport vehicles combust fossil fuels and release substantial amounts of carbon dioxide ($CO_2$) as well as a range of other types of emissions harmful to human health and which can effect anthropogenic changes on the living environment.

## GREEN HOUSE GASES EMMISSIONS IN TRANSPORT SECTOR OF THE EU

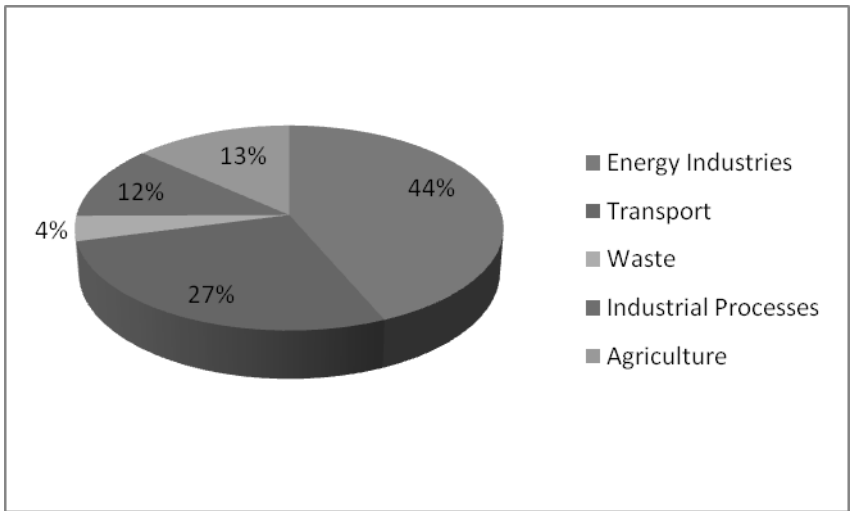
As it could be seen from the figure 4, compared with 1990 levels, in no other sector has the growth rate of GHG emissions been as high as in transport. This section predominantly covers the emissions of greenhouse gases which can contribute to global warming, and thus form a major external cost of transport.




**Source:** EUROSTAT, 2010

**Figure 4.** GHG Emissions by sectors, EU-27

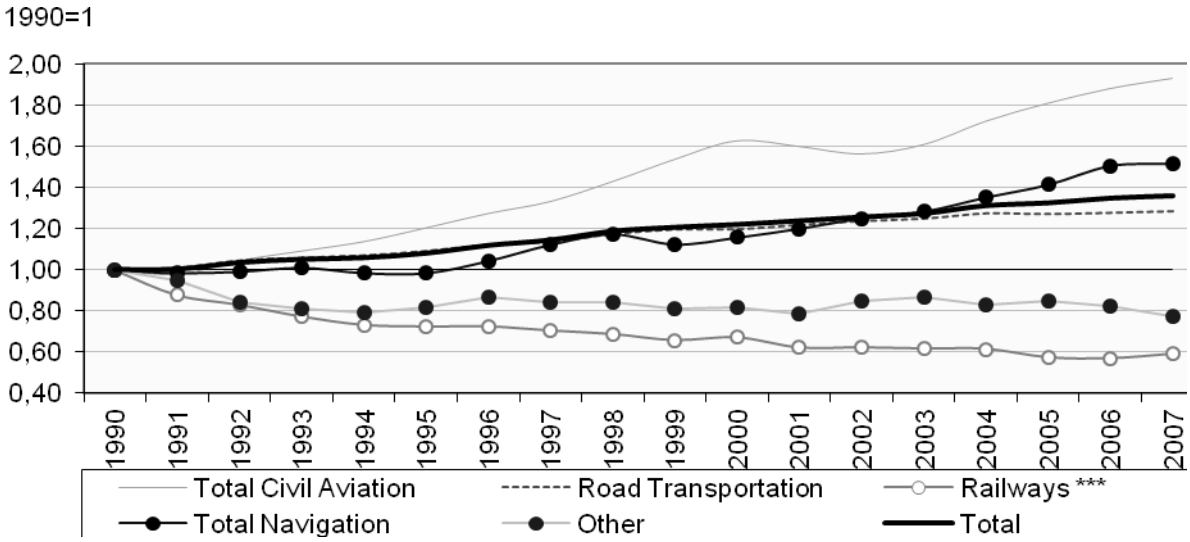
Total GHG emissions of 4 940 million tonnes $CO_2$ equivalent were attributable to transport in the EU-27 in 2008. Second largest after the energy industries (44 %), transport made up a share of 27 % of total GHG emissions (Figure 16). Its proportional contribution has risen from 14 % in 1990 due to own-increases and to reductions in all other sectors. If one were to add the emissions of international maritime shipping and aviation calculated on the basis of emissions from bunkers – of which maritime shipping accounted for 57 % and aviation for 43 % – the total amount would rise from 961,8 to 1 297.3 million tonnes $CO_2$ equivalent.




**Source:** EUROSTAT, 2010

**Figure 5**. GHG Emissions shares by sector – EU-27, 2008

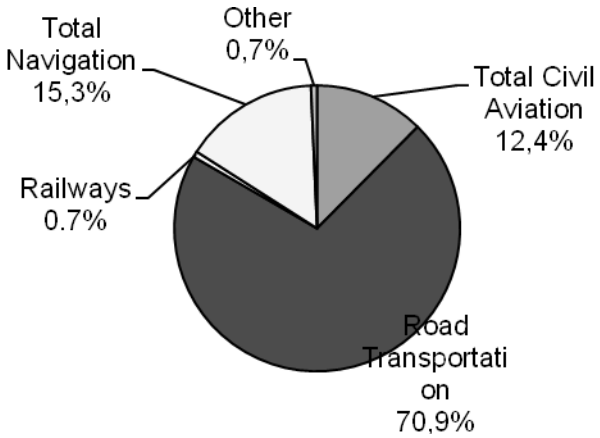
In comparison to an average yearly decrease in total GHG emissions of 0.5 % in the EU-27 from 1990 to 2008, transport was the only sector not to display a reduction in emissions, rather recording growth at an average annual rate of 1.5 % over the period. The 1.5 % average yearly increase in total GHG emissions by transport was driven by annual increases of 1.6 % in road transport and of 2.7 % in air transport. In contrast, rail's GHG emissions fell at a yearly rate of 3.5 % over the period (see figure 17).




**Source:** DG-TREN, Energy and Transport in figures, 2010

**Figure 6.** Greenhouse Gas Emissions (GHG) from Transport by Mode, including International Bunkers: EU-27

Road transport contributed 70.9 % to the greenhouse gas emissions of the transport sector in 2008 (Figure 18). Its share in total transport emissions rose from around 91.8 % at the beginning of the first half, then stabilizing at above 93 % in the latter half of the 1990s. This may be attributed to the road sector's growth and to the reduced emissions of other transport modes. After peaking at around 93.5 % in 2002, road's contribution to the total GHG emissions of transport fell gradually due to the growing share of air transport.




**Source:** DG-TREN, Energy and Transport in figures, 2010

**Figure 7.** Share by mode in Total Transport Greenhouse Gas Emissions (GHG), Including international bunkers: EU-27, 2008

With the aim of improving air quality, cars have to comply with standards for exhaust emissions before being sold on the EU market. Successive 'Euro' emission standards for passenger cars and light vehicles – typically referred to as Euro I, Euro II, etc. – have already helped to reduce air pollution from cars, for example by obliging carmakers to equip exhaust pipes with catalytic converters and particle filters (EUROSTAT, 2009).

The Euro standards set limits on vehicles' emissions of carbon monoxide (CO), hydrocarbons (HC), oxides of nitrogen (NOx) and particulate matter (PM). Separate emissions regulations apply for diesel and petrol cars, vehicles of successive motor capacity, heavy-duty lorries and buses as well as motorcycles. New cars' and light commercial vehicles' (vans) emissions are currently regulated by the Euro IV standards which came into force in 2003 and 2005 respectively. Reducing emissions from road vehicles has come a long way, and the proportion of cars complying with the latest and most stringent emission standards is increasing.

With a share of 2.3 % of transport greenhouse gas emissions, and displaying an average annual growth rate of 0.8 % from 1990 to 2008, inland navigation is of considerable interest from the perspective of greenhouse gases and it still has potential for further development at EU level.

According to EUROSTAT external trade data, maritime transport is used for about 70 % of the EU's freight exchanges with the rest of the world. International navigation accounted for 13 % of EU-27 transport sector GHG emissions in 2008. In November 2002, the European Commission adopted a European Union Strategy to reduce atmospheric emissions from seagoing ships. The strategy reports on the magnitude and impact of ship emissions in the EU and sets out a number of actions to reduce the contribution of shipping to acidification, ground-level ozone, eutrophication, health, climate change and ozone depletion (European Commission, 2009).

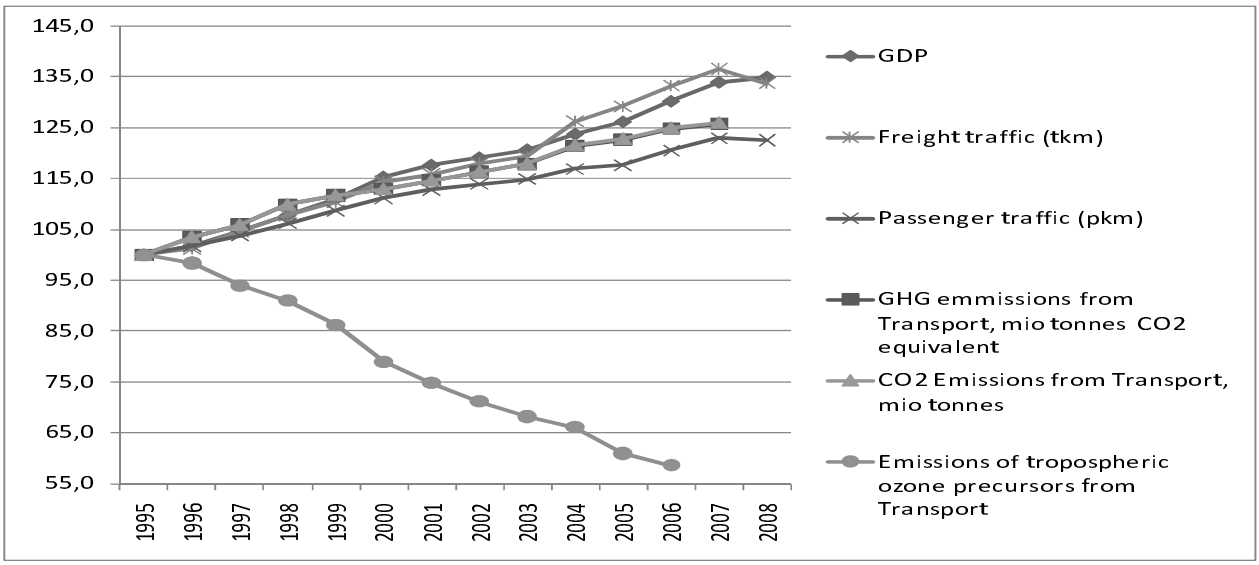
Liberalization of air traffic has certainly brought further positive effects with regard to the 'democratization' of air travel, but it is increasing rapidly, at rates which may outperform the impact of technological improvements that reduce engine emissions. At a local level, in the immediate vicinity of airports, concerns focus on the potential health and environmental effects of noise and air pollution, especially from NOx, volatile organic compounds and particulates.

Not only was air transport the fastest growing energy consumer in EU-27 transport from 1990 to 2008, but it was also the fastest climbing contributor of GHG as its emissions grew at an average annual rate of 2.7 %.

## MEASURES TO BE TAKEN FOR IMPROVING ENVIRONMENTAL PERFORMANCE OF TRANSPORT AND ACHIVE SUSTAINABLE DEVELOPMENT OF THE SECOR IN THE EU

As the transport sector relies on fossil fuels for 97% of its needs, the fight against climate change in this sector goes hand in hand with efforts to improve its energy security of supply. Over recent decades,

EU transport has increased at a sustained pace. Freight transport generally follows trade activity and has grown more than GDP, while passenger transport, except for aviation, has undergone a less dramatic rise (see figure 19) . These trends can only be sustained, however, if transport radically improves its energy efficiency and reduces its GHG emissions.




**Source:** DG-TREN, Energy and Transport in figures, 2010

**Figure 8.** GNG Emissions relative to GDP, freight and passenger traffic, EU-27

Apart from the choice of vehicle and transport mode, a key to further reducing energy consumption and pollutant emissions is the efficient use. The more efficiently vehicles are used – through their higher occupancy rate, optimum volumes of goods transported, style of driving, etc. - the less energy is consumed and the less pollution is caused per person or per tonne of goods per kilometre travelled. Occupancy rates have generally tended to decline over time both for passenger cars and for buses and coaches, while they have remained more or less constant for rail transport. In contrast in air transport, a steady increase in the occupancy rate has taken place. This can be explained, for example, by the increased demand in air travel, the further development of hub-and-spoke systems and the market penetration of low-cost carriers (Gudmundsson, 2004.).

Obviously, there is a compelling need for a technological shift towards lower and zero-emission vehicles and for the development of alternative solutions for sustainable transport. The 21st century will most likely see the replacement of vehicles relying on the internal combustion engine by electric vehicles, including fuel-cell vehicles[1]. At present, electric and fuel-cell cars remain expensive for their performance. While research is closing the cost-competitiveness gap, improvements can be made to the internal combustion engine where the fossil fuels they use can be complemented with biofuels.

The European 'green cars' initiative focuses on five main areas of research:

- electric and hybrid vehicles,
- hydrogen fuel cells,
- biofuels,
- improvements in the internal combustion engine and
- logistics.

Funds provided under this initiative will come from two main sources: grants from the EU's seventh research framework programme (EUR 1 billion) and loans from the European Investment Bank (EUR 4 billion).

In addition, the fuel cells and hydrogen joint technology initiative brings together resources from the EU and the private sector to accelerate the development and broad market introduction of these two technologies (ERTRAC, 2007).

The development of modern aircraft, road vehicles, rail and maritime fleets and new logistic concepts linked with the renewal of fleets can be considered the major determinants of increasing energy efficiency.

[1] Fuel-cell vehicles are electric vehicles which are capable of producing their own electricity out of hydrogen.

However, external incentives – determined by markets and policies – strongly affect the time taken for fleet renewal and modern logistics concepts to take root.

Another crucial problem related to the negative effects from transport is the noise. Noise created by transport has been attracting increasing attention in recent years, and has lead to various measures at EU level concerning the harmonization of noise assessment and management, market access requirements for certain vehicles and equipment, railway interoperability specifications and rules on operating restrictions at airports.

Measures taken in road transport include the more widespread use of 'quieter' car tires with low rolling resistance (for increased fuel efficiency) and the use of noise-absorbing road surfacing as well as mitigation measures such as the construction of noise barriers along roads through or near residential areas.

Railway industry measures cover infrastructure operators (e.g. the acoustic grinding of rails, noise barriers, speed limits at night) and train operators (e.g. replacement of cast-iron brakes with low-noise composite materials). Newly constructed high-speed train tracks are mostly built with noise barriers along sensitive areas.

Aircraft are particularly noisy and they largely affect areas at and around airports, even if modern aircraft are 10 to 15 decibels quieter than previous generations of aircraft. Current legislation provides for the reduction of airplanes' noise at source, land-use planning and management measures, noise abatement operational procedures and operating restrictions. Another area offering potential for reducing aviation's environmental impact is the improvement of air traffic management.

Many Europeans still remain exposed to dangerously high levels of air and noise pollution. Transport itself is suffering from the effects of climate change and necessitating adaptation measures. Global warming resulting in a rising sea level will amplify the vulnerability of coastal infrastructures, including ports. Extreme weather events affect the safety of all modes. Droughts and floods pose problems for inland waterways.

Transport activities give rise to environmental impacts, accidents and congestion. In contrast to the benefits, the costs of these effects of transport are generally not borne by the transport users. The internalization of external costs means making such effects part of the decision-making process of transport users. Besides, the measures for improving the use of existing infrastructure are related to shift towards more ecological modes of transport. It could be achieved through internalization of the external costs for transport. With regard to this the infrastructure charges could be considered as economic instruments for decreasing oil consumption and pollution.

The European Commission released in 2008 a handbook with estimates of external costs in the transport sector (Maibach et al., 2008). The handbook, jointly prepared by several transport research institutes, summarizes the state of the art as regards the valuation of external costs. The Commission intends has make use of this handbook to prepare a communication on a strategy to internalize the external costs for all modes of transport.

Expected results from the initiative are related to:

- the opportunity for balancing modal split while considering for externalities, which will lead to more efficient impact of charges on the use of the infrastructure;
- more efficient use of the transport infrastructure - will lead to reduction in budget expenses for infrastructure, healthcare and environment as well as to direct financial benefits for lower taxes.

The net effect in commercial sector is expected to be positive and direct effect from higher infrastructure charges to be neutralized by decreasing costs for congestions, accidents and by all possible reductions in taxes given by the governments.

## CONCLUSION

There is growing urgency for the transport sector to mitigate its negative impact on the environment. The respond to the goals of the EU SDS and the aim to reduce transport's environmental impacts involve progress towards a number of environmental policy objectives. Lowering consumption of non-renewable resources is essential for all aspects of transport systems and their use. The undesired environmental consequences of transport activity will require further action in particular on noise, air pollutant emissions and greenhouse gas emissions. EU legislation sets requirements in many of these areas but these will require assessment and updating in the future.

Besides, policy-makers are facing demands to meet the changing mobility needs of citizens in ways which are economically, socially and environmentally sustainable. Cities need efficient transport systems

to support their economy and the welfare of their inhabitants. Around 85% of the EU's GDP is generated in cities. Urban areas face today the challenge of making transport sustainable in environmental ($CO_2$, air pollution, noise) and competitiveness (congestion) terms while at the same time addressing social concerns. These range from the need to respond to health problems and demographic trends, fostering economic and social cohesion to taking into account the needs of persons with reduced mobility, families and children (DG-TREN, 2009)

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# COMPETITIVENES OF THE ORGANIC FOOD PRODUCTION IN BULGARIA

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**Abstract**

*The ecological significance of sustainable development has increased dramatically since the so called 'green economy' and organic production have been turning into sources of competitive advantage for the country in the international markets. For its part this undoubtedly leads to stronger economic competitiveness. All government's measures to overcome the consequences of the world economic crisis should aim at directing the economy towards sustainable development and low carbon-emission intensity. The opposite would mean unstable and insecure future, growing production costs as a result of dynamic energy prices and problems in terms of climate changes.*

*Bulgarian economy is strongly dependent on tourism and agriculture. These two sectors show enormous potential for developing 'green economy'. Adequate macro-economic policy aiming at developing these sectors would serve as an additional incentive for creating competitive advantage.*

*Organic agriculture as a sector provides various opportunities due to the well-established traditions. The production of oil-yielding crops, fruit, vegetables, wine and meat has always had excellent world markets. What would really stimulate and intensify the development of this branch is the establishment of a national fund with the aim to finance the development of new environmental technology and innovation. Eco fees (including the newly introduced carbon dioxide tax) can contribute a significantly to this fund. Stimulating the development of 'green' production should involve different fiscal and other economic instruments. Long-term tax reliefs and favoured development of eco-innovations and biotechnologies facilitate the integration of the environmental aspect in the system of economic, industrial and social policies.*

**Key words**: sustainable development, innovations, organic production, green economy, eco-fiscal policy

## Introduction

The globalisation of relations and contacts in world agriculture has raised a lot of new issues that the individual countries and the international community as a whole have to address. They are related to the specific nature of national production, the active import-export flows, the activity of transnational companies and the international credit and financial institutions and markets, the setting up of strong integration units. In the context of these processes issues related to achieving sustainable development are becoming more topical. This necessitates combining equilibrium in the economic and ecological system with reducing or overcoming the negative effects of increased human activity which damages the environment.

Agriculture is a traditional sector for the Bulgarian economy. Bulgaria is a country with extremely suitable conditions for developing plant breeding and animal husbandry – fertile soil, pastures, experience and traditions in this area. The sector is of great importance to Bulgarian economy. It ranks second in the structure of the national economy, after manufacturing. In comparison with the developed countries and some countries in transition Bulgarian agriculture contributes significantly to calculating the gross value added (10.9%) and to providing employment (24.9% of those employed in the national economy).

The reforms towards the transition to market economy have exerted significant impact on the development of agriculture over the past decade of the XX and the beginning of the XXI century. The complex and multifaceted changes in Bulgarian agriculture are related to the need for transition to development within market environment, to the process of its transformation and to the process of European integration, which we have witnessed over the past years. In comparison with other countries in transition the changes

in Bulgarian agriculture are more profound and along with the expected positive results we observe some difficulties which hinder its development.

Over the past half a century Bulgarian agriculture has gone through a period of complex transition from petty agriculture (at the end of the first half of the XX century) to big collective farming (Cooperative farming until the end of the 80s of the XX century) and back again to strongly fragmented land and the formation of a great number of petty farms along with an insignificant number of large-scale farms.

Agriculture is the sector of the Bulgarian economy where market changes started in the beginning of the 90s. Of greatest importance are the changes in the form of ownership and the utilisation of land, in the nature and size of the organisational forms, the structure, specialization and intensification of production, in the employment etc. The major parameters in the development of Bulgarian agriculture are given in Table1.

**Table 1.** Main Economic Indicators in Agriculture

| Indicator- Year | 2000 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|
| Share in GDP,% | 12,8 | 7,7 | 6,8 | 5,1 | 6,0 | 5,1 | 6,4 |
| Share in GVA,% | 14,5 | 9,4 | 8,5 | 6,2 | 7,3 | 5,6 | 6,1 |
| Employment, thousands. | 89,5 | 69,9 | 66,4 | 60,8 | 60,0 | 63,1 | 64,3 |
| Average yearly salary | | | | | | | |
| For the country, euro | 1428 | 1943 | 2128 | 2584 | 3144 | 3655 | 3885 |
| In the branch, euro | 1234 | 1213 | 1310 | 1835 | 2352 | 2638 | 2950 |
| Usable land, thousand hectares | 4424 | 3128 | 3090 | 3058 | 3051 | 3123 | 3103 |
| Production, mln euro | | | | | | | |
| Plant growing | 1274 | 1592 | 1719 | 1531 | 2384 | 2045 | 2074 |
| Stock-breeding | 1414 | 1135 | 1219 | 1219 | 1323 | 1806 | 1831 |
| Share in export,% | 5,0 | 6,8 | 5,7 | 5,6 | 8,2 | 10,4 | 10,7 |
| Share in import,% | 4,1 | 3,9 | 3,9 | 4,5 | 5,4 | 7,9 | 7,6 |

**Source:** NSI

There are a lot of problems facing agriculture in Bulgaria. In the first place, every year it sustains losses amounting to hundreds of millions of levs from unsold produce. The reason for that is the fact that people abandon their arable land or the land is used for other purposes. Nearly 30 thousand hectares farm land is destroyed and is transferred for utilization in other sectors – industrial, protected or resort areas or it is used for the construction of infrastructural projects.

Another significant problem impairing the efficiency of agriculture in Bulgaria results from the lack of motivated, initiative and innovation-oriented people. This is due to constant process of young, well-educated, highly qualified workforce, capable of accepting technological innovation and implementing good practices in agriculture, leaving the country. There is a strong trend towards aging farmers. Between 2004 – 2010 the average age of farm managers was 61, and 41% of them were older than 65. Barely 3% of the managers were up to 35 years of age.

The unfavourable age profile combines with a continuous drop in incomes of farm workers after 1990. In 1997 the average income of an employed in the sector was three times higher than the average annual payment in the country. Ten years on the situation is reversed – the average income of people working in agriculture is twice as low as the average annual payment. The farmland market analysis shows that the prices of land in Bulgaria are a lot lower than the prices in the other EU member states.

The situation on the market of farmland bought in order to use it for other purposes – for example, construction, is entirely different. The prices of this type of land exceed by between a few tens to a few hundreds the price of land purchased for farming purposes. For example, in Southeast Bulgaria in 2008 0.1ha farmland fetched €80 thousand. Changing the purpose of the purchased farmland is not solely related to construction projects. Some of these purchases are made in order to produce crops used in the production of biofuels and for building wind and solar farms – primarily in North and Northeast Bulgaria, along the Danube river and the Black sea coast. Land bought for such purposes costs from €350 to 600 per 0.1 ha.

Along with this change of the purpose of farmland another important problem facing agricultural efficiency in our country is the fragmentation of the farms. In 2007, under the EU criteria there were nearly 500,000 farms in our country. The larger part – 88.9% were small farms with usable land of up to 1.9 ha. Large-scale farms with 5 ha made up barely 3.2%. This structure determines low employment and ineffective utilisation of farmland.

Agriculture can develop in three major areas – conventional, organic (bio) or based on genetically modified food (GMO). The worldwide trend is towards increasing the importance of organic crop production and animal husbandry and related production. Unlike traditional farming, organic farming follows harmony in nature, respects biological cycles and does not pollute environment. The use of natural and organic products is closely related to the latest international trends for healthier and more ecological way of life. Nearly 170 thousand farmers and nearly 149 thousand companies in the 25 EU countries are involved in organic farming. The biological products produced in Europe comprise mainly cereals, fruit and vegetables, vines, dairy and meat products. The first European countries which started producing organic products in the beginning of the 90s were Austria, Germany and Switzerland. Ever since, however, areas with organic crops in Europe have increased from 100 thousand ha to over 8 mln. ha in total. A large part of organic production is concentrated in Australia (11.3 mln. hectares), Argentina (3 mln, hectares) and Italy (1.2 mln.hectares). The world market of organic products is estimated to exceed $26 bln.

The domestic Bulgarian market of organic products reaches around €4 mln. annually. Organic products are considerably more expensive than their counterparts since no insect pesticides or stimulants are used in their production. There is also organic animal husbandry – when animals are fed with organically produced forage and are not given any antibiotics or hormones. This, however, makes production more expensive – simply because a tomato plantation is not treated with pesticides the yield drops by 20%.

Prices of organic products are high both worldwide and in Bulgaria. Despite the increase in supply, this high level is determined by the increased demand motivated by economic, social and ecological concerns. These high prices present a favourable prerequisite for specialisation in a particular field of organic crop production or animal husbandry, both for the domestic market and for export. This represents a market niche with vast opportunities for achieving and maintaining sustainable competitive advantage. No price policy research in this market share has been conducted in Bulgaria. The data in Table 2 is indicative – it shows a comparison of prices of some traditionally manufactured goods and some organic ones, produced in organic farms in Germany.

**Table 2.** Organic product's prices, euro per kilogram

| Product | Organic | Non-organic |
|---|---|---|
| Milk | 0,89-0,99 | 0,55 |
| Bananas | 2,49 | 0,99-1,99 |
| Carrots | 2,09 | 0,59-0,89 |
| Mushrooms/500 grams | 3,95 | 1,29 |
| Lettuce | 2,09 | 0,99-1,45 |
| Potatoes | 0,99 | 0,25 |
| Minced meat | 15,1 | 3-7 |
| Eggs | 1,49 (6 pieces) | 0,59 (10 pieces) |
| Sunflower oil | 3,99 | 0,89 |

## Significance of organic farming

Natural resources, traditional landscape and biodiversity are part of the national wealth. Preservation, restoration and appropriate management comprise the main goal of the sustainable development of rural regions in Bulgaria. Like in many other regions in Europe, one of the great challenges facing the restructuring and revival of the economy in rural areas in Bulgaria is to achieve the appropriate balance between securing food, the need for environment preservation in rural areas and the need for promoting economic development, creating new job opportunities included. One of the most reliable means to achieve the necessary integration of these political goals is organic farming. Supporting it as an eco-efficient method for agricultural production, which is also economically efficient, should take priority in the agricultural policy.

Determining this type of production as strategic ensues from its importance:

- to environment preservation, biodiversity and ecologic norms;
- to establishing a new type of behaviour among producers and mostly among consumers;
- to creating alternative employment in rural areas with predominantly unfavourable conditions for conventional agriculture;
- to promoting 'green economy' – an alternative to sustainable development, promoted by the EU after the 2007 crisis and in accordance with the UN policy.

The focus is on 'green economy' since the ecological field gains priority and the fact that production 'gets green' serves as a source for competitive advantages on the world market. The development of organic manufacture of products and food might prove to be a successful instrument to improve competitiveness of agricultural produce.

The ecologic goals pursued through stimulating the development of organic farming and the production of organic goods are as follows:

• Increasing the land where the methods of organic production are used, as well as the number of organic farms;

• Promoting the creation and development of different systems for organic production;

• Promoting more 'balanced' systems of organic production based on crop-rotation and mixed farms (plant- and animal-oriented);

• Maintaining balanced ecosystems and preserving the soil, water and energy resources;

• Improving the landscape in rural areas by sustaining the biological diversity and preserving the natural habitat, which also contributes to making rural areas attractive for people;

• Enhancing the reliability of seed and seedlings involving methods for organic production.

As a result of the prohibition for utilizing mineral fertilizers and synthetic products for plant protection, organic farming has a favourable impact on biodiversity, contributes to the preservation of water and soil quality, facilitates the equilibrium in the soil-plants-animals system. Organic crop production stimulates the use, therefore the preservation, of old local plant varieties due to their better resistance to illnesses and pests and to their better adjustment to local conditions, i.e. they have a positive impact on preserving the genetic diversity of crops. Organic bee-keeping improves pollination in the wild and contributes to preserving biodiversity. Orchard pollination increases yield with no further use of nitrogen fertilizers, which facilitates soil preservation.

The considerable potential organic farming has in Bulgaria is determined by a multitude of factors:

- favourable natural and climatic conditions;
- high share of land meeting the requirements for organic farming. The transition to market economy brought about the collapse of heavy, polluting industry, as well as intensive agriculture using a lot of fertilizers. Vast areas of idle land appeared and remained such for a long time. Thus, it became possible for soils to get clean from old pollution and to 'rest', accumulating fertility. As a result, around 80% of the land in Bulgaria is considered 'clean', while 38% of the arable land are suitable for organic farming;
- growing demand on the world and the domestic market;
- good legislative framework and regulation;
- existing control and product certification systems;
- progressively growing understanding of the benefits from this type of production;
- well qualified specialists in this field;
- potential for development of innovative and scientific and research projects resulting in greater efficiency;
- effective mechanism meeting the requirements of the European standards as defined in the CAP for granting subsidies.

There are considerable opportunities for developing such production in the country due to the natural and climatic conditions and soil diversity. This provides for growing a wide range of organic products. This type of farming will benefit the development of rural regions and prevention of land backwardness. The additional common benefits are related to creating new 'green' jobs, low-carbon production and sustainable rural development.

## Results from the development of organic farming in Bulgaria

In Bulgaria, like in any other EU country organic agriculture is subject to certain rules. The crops are grown on land which has not been treated with fertilizers at least three years. This has to be certified by a company authorized by the state. After that, organic and certified seeds should be used. The end produce should be approved by an authorized company, too. There are 10 authorized companies and about 300 organic farms in Bulgaria.

Organic food does not have the good commercial presentation the modern consumer is used to, and quite often tit are not durable since it is grown in entirely natural environment. But the food is characterised with something else which is of much greater importance – the loyal consumers whose number has

increased over the past years exponentially. There is an upward trend for the product range for this type of buyers and organic food, which until recently were sold solely in specialized stores, become regular stock in local supermarkets. The times when only honey, herbs and nuts were sold at these stands are gone even in Bulgaria. Vegetables, fruit, food and drinks, pastry and confectionery, even lamb and veal are sold there. About 300 types of organic food are produced in the country. We can compare this number with the numbers in the remaining East European countries where there are between 1 000 and 2 500 organic goods, while in West Europe they exceed 10 000 where there are also non-food products – mainly cosmetics. All this means that there is a tendency towards a growing market and larger product range. The 2010 data show that the budget for organic food has been considerably increased.

Since 2001 there is a law in Bulgaria under which farmers are entitled to financial aid. It regulates the production and processing of organically produced goods, grown in natural environment (without chemicals, genetically modified ingredients, different artificial additives etc.). Organic farming in Bulgaria occupies 166,741 hectares, which is 3.1% of the municipal land and its production is constantly increasing. It is mainly pastures (155.793 hectares) that are certified as ecologically clean. The same certificate has been granted to 242,677 hectares of forest where herbs, mushrooms and wild berries are collected.

Currently, the structure of the organic produce sold in the country is as follows: food is offered by 66% of all traders, herbs – 48%, organic cosmetics – 41%, essential oils – 29%.

The problems traders and manufacturers of organic products face can be grouped as follows:

• Financial problems, including insufficient funds, expensive production, considerable expenses, expensive animal feed etc. Production becomes more expensive when the quantities sold are very small. What is more, certification itself costs around €350 thousand per year. The produced goods are much more expensive than conventional goods which predetermines the fact that it is almost impossible to operate organic farming without initial investment. The European subsidies aim to offset the additional costs but in order to qualify for those subsidies farmers have to meet high requirements.

• Difficulties related to the production process – undeveloped processing establishments, difficult access to plant protection products for organic products, difficulties related to watering or providing the necessary machines, resources, treatment etc. Small, fragmented plots run by several enthusiasts dealing with organic farming, cannot provide access of this type of production to the EU markets.

• Labour-intensive production requiring qualified workforce that cannot be easily found.

• Low purchase prices and problems related to selling production in the country and abroad, sluggish market for organic goods in Bulgaria. Only 1-1.5% of the milk is sold as organic. The prices of organic goods are by 30 – 50% higher than those produced in conventional agriculture, but this is not a big problem on the Bulgarian market since there is a coherent group of consumers of this production. The bigger problem lies in the insufficient supply, lack of manufacturers, distributors and retailers of such products. It will take time and coherent government policy to stimulate and control the quality of goods in order to complete the chain. A serious problem arises from the fact that there is no clear differentiation between the notions natural, ecological and organic, of which only organic by law has the brand guarantee for producer and consumer.

• Difficulties which ensue from legislation, control and bureaucratic procedures. Due to administrative and volitional reasons a little more than 1% of the €455 mln earmarked for the period 2007 – 2013 for Bulgaria have been absorbed. There are two certifying bodies in Bulgaria and the certificates it issues are recognised on the European market. The services of foreign certifying firms may be used, but the certificate costs around €20 thousand per year. The legal framework in the field of organic farming is not homogeneous, the laws are not exhaustive, there are no national minimal requirements for the production of typically national organic goods, and there is no data about the state of organic farming in the country. Organic farmers should have at least 10-year rent contracts if they are to develop this type of agriculture, but over the last years mayors have started to terminate long-term contracts for municipal land on a large scale, which has additionally hindered the process.

So, it becomes obvious that the excellent opportunities for organic farming in our country cannot be utilized for the time being due to the mentioned practical obstacles. The Bulgarian market is insolvent in this field, whereas the world market remains inaccessible because the Bulgarian organic farming is fragmented, which determines the limited production.

Bulgarian agriculture and the related industries are the leading sectors in foreign trade. They have become of particular importance after the country joined the EU in 2007. This can be explained both with the historical development of the sector and with the modern prospects and tendencies in the sector.

Over 95% of the currently certified organic production manufactured in Bulgaria is exported mainly to western European countries (the Netherlands, Germany, Switzerland, Austria), the USA and Canada. The-

se are mostly herbs – dried and as tea, fresh, frozen or tinned fruit, vegetables, honey, nuts, essential rose, lavender and peppermint oils.

Bulgarian firms fulfil orders of foreign contractors who process or repackage the production and sell it with their brand. Bulgarian organic products are sold with foreign brands which are recognizable by the European consumer. This, for the time being, is the only successful way of breaking into the world market.

## For efficient macroeconomic policy in the field

The fact that Bulgaria is focused on recovering from the recession should not divert our attention from the pressing issues related to what kind of economy we want to develop. If we do not do everything necessary to direct the economic recovery of the country towards sustainable low carbon future, we will be faced with a long-lasting uncertainty and considerable expenses due to the energy price dynamics and a destabilising environment.

Along with that we have an incredible opportunity – to stimulate our own recovery, disclosing new sources of jobs and export. Bulgaria stands a good chance to find its place in this field. Our economy is strongly dependent on tourism and agriculture. Both branches have potential for 'green economy'.

If the government and the business take too long, Bulgaria will not only lag behind in its competitiveness, but there will be serious consequences for the labour market, prices, wages and incomes. Actually, this is the next big challenge the country has to address after the crisis. Stimulating such production creates prerequisites for competitiveness and new comparative advantages for the Bulgarian economy.

Overcoming the consequences of the current economic crisis through the use of resources to stimulate 'green' manufacturing is not simply an opportunity, but an indispensable prerequisite for the modernisation of the European economies. The future competitiveness will depend on energy efficiency and resource management. Although Bulgarian firms are strongly threatened by cost rise and loss of competitiveness in comparison with the rest of the world by making firm ecological commitments, this is a serious investment in the future.

One of the greatest challenges facing Bulgaria in the process of economic restructuring is securing balance between the sufficient production of food and increase in employment and the preventive environment protection.

Currently, organic farmers can receive financial aid under the first pillar of the Common Agricultural Policy through direct payments and measures for supporting prices. Stimulating measures are envisaged under the second pillar of CAP for rural development by means of agri-environmental payments. These are axis-2, measure 214 and axis-1, when purchasing the necessary equipment for organic agriculture.

Financing agricultural producers involved in ecological farming, including organic farming is based on Measure 214 "Agri-environmental payments" from the Rural Development Programme (RDP) for the period 2007 – 2013. The implementation of Measure 214 is regulated by Regulation 11 of 06.04.2009 stipulating the terms and order for implementing measure 214 "Agri-environmental payments" from the Rural Development Programme for the period 2007 – 2013. In terms of organic production Regulation 11 specifies the financial aid for organic plant breeding and organic bee keeping.

Agri-environmental activities are financed for a period of 5 years. The financial help is in the form of annual payments with 82% of the funds provided by the EU, and 18% - by the national budget. The people receiving aid under sub-measure "Organic farming" are obliged to observe the requirements laid down by Regulation of the Council 834/2007 and Regulation of the Commission 889/2008 and should get at least once over the five-year support period a certificate or written proof for compliance of the manufactured goods with the rules for organic production.

There is a National agri-environmental programme (NAEP) too. Its main goal is stimulating the eco-friendly agricultural production methods. NAEP will provide agri-environmental payments for farmers who willingly cultivate their land in an environment friendly way and in this way provide benefits for the entire society.

Farmers involved in organic agriculture are entitled to the following amount of money under RDP:

Arable crops: in transition - €181 per hectare, undergone transitional period – 155 €/ha;

Permanent crops, vines, oil rose; in transition - 505€/ha, undergone transitional period – 418 €/ha;

Vegetable crops, including mushrooms: in transition – 483 €/ha, undergone transitional period – 357 €/ha;

Bee hives: in transition or undergone transitional period – 11.5€/ha.

In 2008 BGN 4.232 mln. were paid out to 106 applicants who have submitted applications. To applications submitted in 2009 for the period 01.12.2009 – 06.07.2010 BGN 4.569 mln. were paid out under the measure.

The qualitative analysis of the approved applications shows that the number of the approved applicants for aid under the measure is merely 2.6% of the goal set in the RDP, but the plots approved for aid are 25.5% of the set goal. In terms of genetic resources the number of the approved projects amount to 9.8% of the target.

Another area in providing financial aid to farmers (including those dealing with organic agriculture) is investment lending. In 2009 investment lending was directed towards stimulating the investment process in agriculture and is carried out within the framework of three programmes –"Plant breeding", "Animal husbandry" and "Agricultural machinery". The three investment programmes and the subsidies granted refer to the so called "existing government aid" with maturity date 31.12.2009. The activities and objects to be financially supported are:

· purchasing pedigree and fertile animals;
· creating and restoring bee hives;
· purchasing machines for animal husbandry;
· new construction, purchasing, restoring and restructuring of agricultural buildings and milk-collecting stations;
· creating and restoring permanent crops;
· establishing nurseries;
· new construction, purchasing, restoring and reconstruction of greenhouses;
· restoring rice fields;
· purchasing agricultural machinery and tools, including spare parts.

29 projects have been financed, respectively refinanced under the three investment programmes. Credit funds amounting to BGN 31,919,036 have been granted, which is by 162.5% more than the funds extended in 2008 (BGN 12,578,299). The investment projects are financed directly from the Fund with an annual interest rate of 6% and through refinancing by the Commercial banks at 9% interest rate.

By 2013, when the Rural Development Programme ends, Bulgarian producers will have at their disposal approximately BGN 1.6 bln reserve budget for agri-environment, organic production and compensatory activities in the mountainous regions and these funds cannot be transferred to any other activities. Producers and experts believe that a very big part of these subsidies will not be absorbed because the requirements towards environment-friendly plant breeding and animal husbandry are very demanding.

The European regulations require that 8% of the agricultural land in Bulgaria be planted with organic fruit, vegetables and cereals by 2013. Currently there are merely 3.1% organic plants. The aim of the programme is to have 3% organic production of the whole agricultural production.

Strategic goals and earmarked budget:

1. Development of the market of organic products – BGN 29,975 thousand;
2. 8% of the used agricultural land should be cultivated in an organic manner by 2013 – BGN 84,017 thousand;
3. Practice-oriented scientific research, education, training and consultancy in the field of organic agriculture – BGN 48,359 thousand;
4. Introducing an efficient system of control and certification – BGN 2,173 thousand.

For each of the strategic goals the budget is presented in detail for each year. The total budget granted for the fulfilment of the National Plan for Development of Organic Farming (NPDOF) goals is BGN 164,544 thousand.

The achievement of these goals requires much more active policy on the part of the state to stimulate and encourage organic producers.

## Recommendations for improving the macroeconomic efficiency

1. We should not rely entirely on European subsidies. They should be accompanied with government support to stimulate organic production. In 2009, in the conditions of economic crisis, farmers faced difficulties in acquiring the financial resources necessary for the sowing campaign from the commercial banks. Given the situation State Fund Agriculture initiated two schemes for short-term credits at 3% interest rate. This practice can be implemented with priority for organic farmers.

2. Bulgarian organic farming today can provide neither permanent nor sufficient deliveries for the European market and for the domestic one alike. This is a reason why big chains of stores do not show any interest (or just slight interest) towards these products. It is possible to carry out trade in smaller but specialised and easily recognizable shops with constantly growing network of stores.
3. Financing scientific research related to new technology for organic production and processing of organic products should take priority. Creating an entire chain: science – production - processing – placement of organic food would spur the development of the sector. Stimulating agri-environmental innovations along with the compulsory education of farmers will make it possible to avoid mistakes in the process of organic production and violating the strict quality control measures which are the result of the lack of information.
4. Ecological technology is the road to the future development of "green economy". It is also a method of forming a new environmentally-friendly behaviour in the public and private entities. The measures which would stimulate and accelerate a behaviour like that are mainly the following:

- Creating a national fund supporting the development of new ecological technologies. Its resources should be the result of "green taxes" (for example, carbon tax should be collected in a separate fund).
- Encouraging the creation of funds for developing ecological production (through lower taxes for a long period of time, other reliefs and preferences) and in particular the innovative and scientific activity directed at developing ecological technology.
- Encouraging the creation of municipal and regional funds financing similar activities.
- Creating new jobs in sectors with high ecological potential.
- The provision of subsidies and payments in agriculture should depend on and correspond with the equipment meeting the ecological norms and standards.
- Partnership between the national government and the European structural funds in financing ecological projects.

Encouraging ecologically efficient innovations is obviously an opportunity for an activity beneficial for all participating parties and it should be fully utilized in view of "Europe 2020" goals. Innovations which contribute to reducing environmental pollution, implementation of products whose production requires fewer resources and more efficient resource management facilitate the acceleration of growth and increase employment and also create opportunities for overcoming the economic growth dependency on the use of resources and pollution.

5. The state can define ecologically clean regions in the country where organic farming can be developed. If the process is regulated, the farmers will not waste money and time to get certification. This activity can well be combined with ecotourism and/or historic tourism for which Bulgaria provides excellent conditions. This type of putting together various activities brings to the fore a different, entirely new product, directed at our health and the wellbeing of the entire planet. This product matches the needs of the new tourist, i e. the one who cherishes the clean and beautiful nature, the meals cooked from ecologically clean products, the tourist who finds all that not only a tourist attraction, but a lifestyle.
6. An acceptable idea is the one about "green VAT" – lowering VAT for products which meet the ecological norms and for companies which change their behaviour in the direction of ecologically-oriented model of production. So far the choice of productions which can take advantage of lower VAT was based on social considerations rather than ecological. The introduction of such reliefs for sectors with energy saving production and with low carbon intensity would be a step forward in the "greening" process of the economy. A measure like this would affect favourably the end price of organic products, therefore their competitiveness.
7. Additional financial aid encouraging farmers to use and manage environmentally-friendly resources. An approach like that is part of the new tendencies to reform the EU Common Agricultural Policy after 2013 and corresponds with the process of 'greening' of agriculture.
8. Maximum simplification of the certifying procedures of organic products and the administration of payments. With regard to encouraging more farmers to switch to organic production it is necessary to gradually enlarge the scope of the activities under measure 214 "Agri-environment".
9. Closely connecting the policy for encouraging organic agriculture with the other measures for sustainable development of rural areas. For example, giving priority to financing infrastructural projects in the municipalities with predominantly developed organic farming and ecological tourism.

10. A number of additional fiscal reliefs are possible both for producers of organic products and for the processing establishments, such as partial remission of the corporate tax for registered farmers who are legal entities, remission of corporate tax for tax liable individuals, remission of tax on incomes from farming for registered farmers and tobacco producers who are physical bodies, tax exemption for buildings used for farming, imposing preferential excise duty rates on motor vehicles used for agricultural land cultivation.

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# IS PUBLIC CAPITAL MORE PRODUCTIVE THAN PRIVATE CAPITAL: EVIDENCE FROM LATVIA 1995 – 2009

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**Summary**

*The purpose of this article is to estimate private and public capital contribution to economic growth in Latvia 1995 - 2009 using production function approach. It was found that both private and public capital have positive and statistically significant impact on economic growth and labour productivity. Moreover, public capital is 1.6 times more productive than private capital. Nevertheless, private capital accumulation affects technical progress through "learning by doing" externality. It was shown that total factor productivity and private capital formation were the main driving forces of economic growth in Latvia 1995 – 2009. It was pointed out that production function should be augmented with cyclical variables when output is constrained by the aggregate demand which is a case for Latvia in 2008-2009.*

**JEL:** C5, H4, H54, 047, 052

**Keywords:** production function, private capital, public capital, economic growth, total factor productivity

## 1. Private and public capital role in economic growth

Since Barro [1, 1988] introduced an augmented production function by dividing physical capital stock into private capital and public capital, much empirical research has been made on this topic. However, by this time no clear-cut answer was found on whether public capital statistically significant affects economic growth and whether it is more productive than private capital. In dependence of production function form, assumptions about returns to scale, data and a country considered, researchers came to different results. As Naqvi put it, "at least as many studies report that public capital is more productive than private capital, as report the reverse" [11, 2003, page 4]. For example, according to Naqvi [11, 2003, page 2], "public capital is at least as productive as private capital under the assumption of exogenous technology, and significantly more productive than private capital under the alternative assumption of endogenous technology evolving as an externality to capital accumulation". Moreover, Khadharoo and Seetanah [8, 2000] argue that public capital positively affects private capital accumulation. On the contrary, Holtz-Eakin [7, 1994] concludes that GDP elasticity to public capital is close to zero and is not statistically significant. Besides, Macdonald [9, 2008] says that public capital role in economic growth could be underestimated because of its strong correlation with total factor productivity. At the same time, Henderson and Kumbhakar [6, 2005] claim that GDP elasticity to public capital is not constant over time and proposed non-parametric production factors elasticity estimation methods.

This paper provides an empirical evidence on the public and private capital contribution to economic growth in Latvia during 1995 – 2009 period using production function approach. The remaining of this section provides theoretical foundations while section 2 focus on data and section 3 shows production function estimates and discuss an outcome.

Production function shows gross domestic product $(Y)$ dynamics in respect to capital stock $(K)$ and labour $(L)$. Technical progress is usually considered exogenous and depends only to time period. This paper estimates eight production function specifications, constructed by the other researchers in order to examine important insights of the production process and choose the best specification among alternatives for Latvia.

Most frequently production function is estimated in the following form:

$$\ln Y = \hat{\beta}_0 + \hat{\beta}_1 t + \hat{\alpha}_K \ln K + \hat{\alpha}_L \ln L \qquad (1)$$

where $\hat{\alpha}_K$ is estimated GDP (Gross Domestic Product) elasticity in respect to capital,

$\hat{\alpha}_L$ - estimated GDP elasticity in respect to labour,

$t$ - time period,

$\hat{\beta}_0$ - positive constant that shows country initial technology level,

$\hat{\beta}_1$ - estimated average technical progress contribution to economic growth during one period, percentage points.

Empirical research usually assumes constant returns to scale in respect to capital and labour together $(\alpha_K + \alpha_L = 1)$. According to this assumption, if capital and labour grow by 1% each and technological progress remains constant, GDP grows exactly by 1%. In its turn, if only either labour or capital grows by 1%, GDP grows by less than that. Production function in this case becomes:

$$\ln Y = \hat{\beta}_0 + \hat{\beta}_1 t + \hat{\alpha}_K \ln K + (1 - \hat{\alpha}_K) \ln L \tag{2}$$

Estimating both equations (1) and (2) could help to clear up whether constant return to scale restriction is binding in the case of Latvia. Bradley and Morgenroth [2, 2004] mention that there is a possibility that some specialization possibilities are not exhausted in small open economies, therefore it could exhibit increasing returns to scale. So, if constant return to scale restriction will appear to be binding then production function (2) is not correctly specified and equation (1) should be used in the subsequent analysis.

Further equation (1) could be augmented dividing physical capital into private and public components:

$$\ln Y = \hat{\beta}_0 + \hat{\beta}_1 t + \hat{\alpha}_{KP} \ln K_P + \hat{\alpha}_{KG} \ln K_G + \hat{\alpha}_L \ln L \tag{3}$$

where $\hat{\alpha}_{KP}$ is estimated GDP elasticity in respect to private capital,

$\hat{\alpha}_{KG}$ is estimated GDP elasticity in respect to public capital.

According to constant returns to scale assumption in respect to private capital, public capital and labour, we obtain:

$$\ln Y = \hat{\beta}_0 + \hat{\beta}_1 t + \hat{\alpha}_{KP} \ln K_P + \hat{\alpha}_{KG} \ln K_G + (1 - \hat{\alpha}_{KP} - \hat{\alpha}_{KG}) \ln L \tag{4}$$

Moreover, some authors tested alternative specifications as well. For example, Macdonald [9, 2008] used an assumption about constant returns to scale only to private inputs and regarded public capital is additional factor which ensure positive returns to scale from production factors altogether:

$$\ln Y = \hat{\beta}_0 + \hat{\beta}_1 t + \hat{\alpha}_{KP} \ln K_P + \hat{\alpha}_{KG} \ln K_G + (1 - \hat{\alpha}_{KP}) \ln L \tag{5}$$

Macdonald [9, 2008] also mentions that there is strong correlation between public capital and total factor productivity, so exogenous technical progress may underestimate public capital productivity. Therefore the following specification should be estimated:

$$\ln Y = \hat{\beta}_0 + \hat{\alpha}_{KP} \ln K_P + \hat{\alpha}_{KG} \ln K_G + (1 - \hat{\alpha}_{KP} - \hat{\alpha}_{KG}) \ln L \tag{6}$$

Some authors study how public capital affects labour productivity. For example, Naqvi [11, 2003] tests whether technical progress is "learning by doing" externality from physical capital accumulation. Specification with endogenous technical progress is the following:

$$\ln \frac{Y}{L} = \hat{\beta}_0 + \hat{\alpha}_{KP} \ln\left(\frac{K_P}{L}\right) + \hat{\alpha}_{KG} \ln\left(\frac{K_G}{L}\right) + \hat{\alpha}_L \ln(L) \tag{7}$$

where $\frac{Y}{L}$ is labour productivity

$\frac{K_P}{L}, \frac{K_G}{L}$ is private and public capital per employed, respectively

$\hat{\alpha}_{KP}$ and $\hat{\alpha}_{KG}$ is labour productivity elasticity in respect to private and public capital stock per employed, respectively.

If $\hat{\alpha}_L$ in the above equation is positive, than labour productivity is positively affected by the number of employed indicating to positive returns to scale in respect to labour, and the opposite is true if $\hat{\alpha}_L$ is negative. Alternative specification (without externalities) includes exogenous technical progress:

$$\ln\frac{Y}{L} = \hat{\beta}_0 + \hat{\beta}_1 t + \hat{\alpha}_{KP}\ln\left(\frac{K_P}{L}\right) + \hat{\alpha}_{KG}\ln\left(\frac{K_G}{L}\right) + \hat{\alpha}_L \ln(L) \qquad (8)$$

The presence of learning by doing externality from physical capital accumulation is then tested by comparing $\hat{\alpha}_{KP}$ and $\hat{\alpha}_{KG}$ between equations (7) and (8). For example, if $\hat{\alpha}_{KP}$ in equation (7) is significantly higher than in equation (8), than learning by doing externality from private capital accumulation is present.

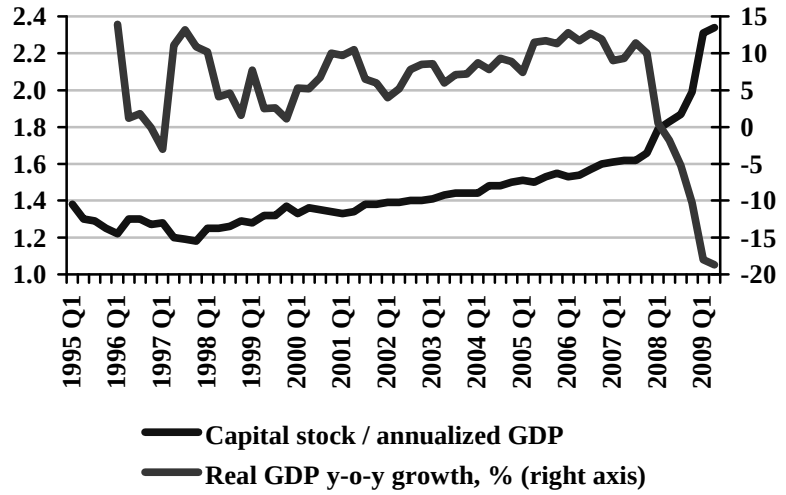
## 2. Data

This research uses quarterly data from Q1 1995 to Q2 2009, therefore the data set consists of 58 observations. The sample was constrained by data availability since there is no reliable statistics prior to 1995. All time series were seasonally adjusted using Census X12 multiplicative method. Monetary indicators (GDP and capital) were used in real terms (2000 year prices). As capital stock data from national accounts were available on annual basis and are subject to methodological revisions, the capital stock on quarterly basis was estimated, assuming that capital level at the end of each quarter $(K_{t+1})$ is equal to accumulated capital at the beginning of this quarter $(K_t)$ plus investments $I_t$ (gross fixed capital formation, P51 in national accounts) apart from depreciation $(\delta \cdot K_t)$:

$$K_{t+1} = (1-\delta)\cdot K_t + I_t \qquad (9)$$

Various authors use different physical capital depreciation $(\delta)$ rates. Stikuts [12, 2003] assumes depreciation rate to be 2% per quarter, but Naqvi [11, 2003] – to be 2.5% per quarter, which is roughly equal to 8% and 10% during the year, respectively. Both depreciation rates were used and results are broadly similar (estimates with 2.5% depreciation rate are posted in this paper).

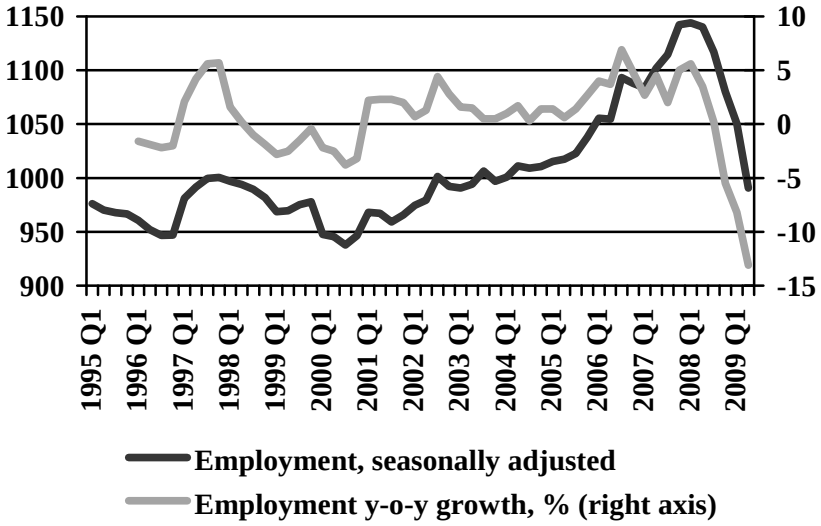
Next, initial capital level was defined. According to national accounts data, capital level at the end of 1994 was 3.6 billion lats at current prices – this corresponds to 4.8 billion lats at 2000 year prices, which was about 130% of country real GDP. Based on Dadhan and Zahedi capital level estimation for some countries [4, 1986] this capital / output ratio could be considered reliable. Figure 1 shows that capital stock / GDP ratio gradually increased from the end of 1990s and rose significantly during the last two years partly because of the GDP contraction (denominator effect).




**Source:** Central Statistics Bureau of Latvia [3, 2009]; author's calculations

**Figure 1.** Physical capital stock to GDP ratio and GDP y-o-y growth rate in Latvia during 1995 – 2009.

It was assumed that labour is equal to the number of employed. Labour survey data on quarterly basis are available only from 2002, so we used employment figures from national accounts. No adjustments were made in respect to education length and working hours as quarterly data for the former are not available, for the latter it is available only from the year 2000. Moreover, according to World Bank report [14, 2005] these effects can cancel each other. The number of employed was not adjusted for the cycle (for example, by subtracting non-accelerating inflation rate of unemployment from the labour force) since we believe that the number of employed is more relevant labour input measure except for measuring an output gap. Figure 2 shows that the number of employed was broadly stable in the first part of the sample, but increased considerably during the 2005-2007 (period of labour shortage) and decreased sharply from the second half of 2008.




**Source:** Eurostat [5, 2009]; author's calculations.

**Figure 2.** Employment according to national accounts methodology (thousand; y-o-y growth rate)

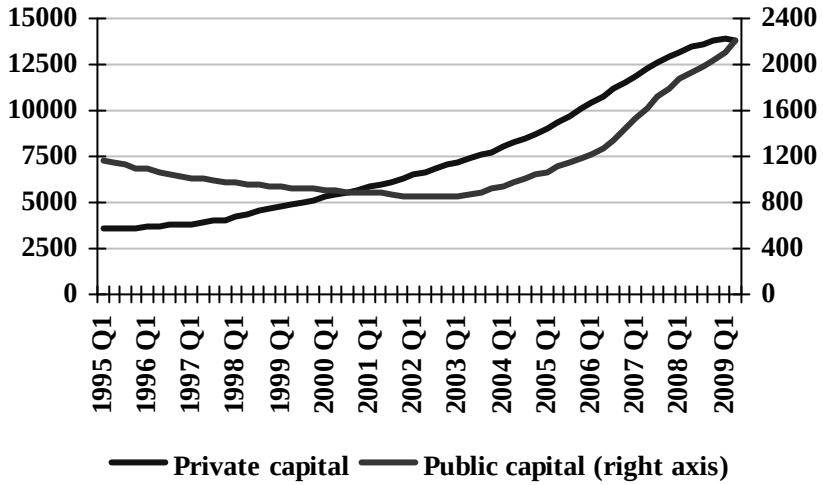
One of the main challenges here was to estimate public and private capital stock since government gross fixed capital formation expenditures are available as from 1999 and only in nominal terms. Moreover, private and public capital dynamics is dependent on assumption about initial share of public capital in total physical capital.

Public capital time series in real terms were constructed in three steps:

1. Public investments share for each quarter during 1999 - 2009 was calculated by dividing public investments to total investments (both in nominal terms). Than it was extrapolated for 1995 – 1998

using four-quarter moving average method. In result, public investments share in 1995 Q1 was estimated at 6.0%, which could be regarded as a realistic result.

2. Public investment in real terms was calculated by multiplying public investment share obtained in the first step by total real investments.
3. Initial public capital share was set at 18% based on national accounts data. It should be mentioned that both national accounts public capital stock and public investment data exclude state enterprises such as Latvenergo (energy), Latvijas Gaze (natural gas distribution), Lattelecom (communication), therefore in this paper capital stock of state enterprises is treated as private investment. Capital depreciation rate was set at 2.5% per quarter both for private and public capital. Private and public capital estimated time series are shown in figure 3.




**Source:** author's calculations.

**Figure 3.** Private and public capital stock in Latvia 1995 – 2009 (seasonally adjusted, million lats).

Figure 3 shows that until 2002 public capital level gradually decreased: investment share in government spending was low and it could not compensate public capital stock depreciation. However, from 2003 both buoyant economic growth and access to EU funds (pre-structural and than to structural) contributed to public capital stock increase. At the end of Q2 2009 public capital stock was 2.3 times larger than initially. Private capital stock grew even faster and during the last 14 years increased 3.5 times.

## 3. Production function estimation results

This section presents the main results of the production function estimation in the forms (1) – (8). Equation (1.2) shows production function estimation in the unrestricted form for the whole sample. Capital stock is not significant and Durbin-Watson statistics points to a positive autocorrelation and spurious regression leading to a conclusion of incorrect specification. This result appeared owing to a large economic contraction as from 2008 which resulted in a sharp unemployment upswing, and correspondingly, a fall in the production factors use intensity as evidenced by Fadejeva and Melihovs [5, 2009].

Therefore economic contraction built a wedge between capital stock accumulated and capital stock used, that is why production function estimates give correct results only when supply factors are binding economic growth, which is not the case for Latvia as from 2008. This could be shown limiting the sample to 1995 – 2007 (equation (1.1) in the table 1): capital stock is highly significant and regression statistics do not point to incorrect specification. Nevertheless, equation (1.3) shows that production function could be estimated for the whole sample as well by augmenting it with additional variables that feature cyclical conditions. First variable is a measure of cyclical unemployment defined as a difference between registered unemployment rate and previous 24-month average registered unemployment rate. Alternative measures of a cycle (proxies of unemployment) were used as well - they were statistically significant but less powerful in explaining GDP variation. Nevertheless, cyclical unemployment did not represent the cycle fully, possibly to the labour hoarding behavior of the firms (negative residuals at the end of the sample became smaller but nevertheless statistically significant), therefore two dummies were added – for 2008 and 2009, respectively (Chow breakpoint test showed maximum F-statistic for 2008 Q1, moreover,

splitting this dummy for 2008 and 2009 further increase the adjusted determination coefficient). In this case, residuals at the end of the sample fall down within 2 standard deviation bounds.

Equations (1.3) and (2) in the table 1 compares unrestricted and restricted production function estimation results for the whole sample. Wald coefficient test results (not shown here) implied that assumption about constant returns to scale is not binding in the case of Latvia. In this case, as argued by Holtz-Eakin [7, 1994], constant returns to scale form is desirable. Equation (2) in the table 1 states that GDP elasticity in respect to capital is equal to 0.295, in other words, if capital grows by 1%, GDP increase by 0.295% on average. The result is broadly similar to other authors. While Stikuts [12, 2003] estimates it at lower level (0.225), it could be due to the fact that he used 1995 – 2004 time period (if we repeat estimation in this sample, without three additional variables, GDP elasticity in respect to capital diminishes to 0.248). Melihovs and Davidsons [10, 2006], using more recent data (1995 - 2006) estimated GDP elasticity in respect to capital to be 0.303.

**Table 1.** GDP elasticity to capital and labour

| | (1.1) | (1.2) | (1.3) | (2) |
|---|---|---|---|---|
| Sample: | 1995-2007 | 1995-2009 | | |
| Functional form: | unrestricted | | | restricted |
| $\hat{\beta}_0$ | 3.999*** | 6.522*** | 3.363*** | 4.326*** |
| $\hat{\alpha}_K$ | 0.342*** | -0.197 | 0.296*** | 0.295*** |
| $\hat{\alpha}_L$ | 0.647*** | 1.478*** | 0.697*** | 0.705 |
| $\hat{\beta}_1$ | 0.0083*** | 0.0175*** | 0.0089*** | 0.0089*** |
| [dummy for 2008] | | | -0.106*** | -0.107*** |
| [dummy for 2009] | | | -0.213*** | -0.213*** |
| [cyclical unemployment] | | | -0.010*** | -0.010*** |
| Standard error of regression | 0.0192 | 0.0480 | 0.0186 | 0.0184 |
| Adjusted coefficient of determination | 0.9950 | 0.9715 | 0.9957 | 0.9958 |
| Durbin – Watson statistics | 1.49 | 0.48 | 1.80 | 1.81 |
| Akaike information criterion | -4.99 | -3.17 | -5.02 | -5.06 |
| Schwarz criterion | -4.84 | -3.03 | -4.77 | -4.84 |

*, **, *** significant at 90%, 95% and 99% respectively.
Coefficients that has not estimated directly but derived from other coefficients are underlined.
**Source:** author's calculations.

Table (2) presents production function estimates in the forms (3) – (8), thus, dividing accumulated physical capital stock by private and public components. Like before, Wald coefficient test does not reject the null hypothesis about constant returns to scale both for (4) and (5), but gives preference to (the larger probability that null hypothesis is true) $(\hat{\alpha}_{KP} + \hat{\alpha}_{KG} + \hat{\alpha}_L) = 1$ contrary to $(\hat{\alpha}_{KP} + \hat{\alpha}_L) = 1$. Therefore functional form (4) appears to be superior than (3) and (5; not shown here). According to equation (4), both private and public capital is highly significant. GDP elasticity in respect to private capital appeared to be almost four times higher than that of public capital (0.231 and 0.047 respectively). However, regarding that private capital stock was on average 7.8 times higher than public capital, each lat of public capital is 1.6 times more productive than that of private capital. Moreover, all three additional variables that reflect the recent cyclical downturn are highly significant and residuals at the end of the sample in all specifications presented in table 2 are within 2 standard deviation bounds.

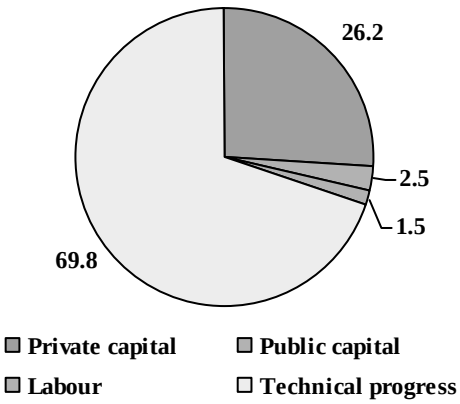
**Table 2.** GDP elasticity to private capital, public capital and labour

| | (3) | (4) | (6) | (7) | (8) |
|---|---|---|---|---|---|
| Dependent variable: | ln (real GDP) | | | ln (real productivity per employed) | |
| $\hat{\beta}_0$ | 6.314*** | 4.596*** | 1.325*** | 1.321*** | 4.630*** |
| $\hat{\alpha}_{KP}$ | 0.139 | 0.231** | 0.661*** | 0.662*** | 0.226** |
| $\hat{\alpha}_{KG}$ | 0.079** | 0.047** | 0.009 | 0.009* | 0.048** |
| $\hat{\alpha}_L$ | 0.611*** | 0.722 | 0.330 | | |
| $\hat{\beta}_1$ | 0.0116*** | 0.0094*** | | | 0.0095*** |
| [dummy for 2008] | -0.117*** | -0.112*** | -0.093*** | -0.093*** | -0.113*** |
| [dummy for 2009] | -0.238*** | -0.220*** | -0.218*** | -0.220*** | -0.222*** |
| [cyclical unemployment] | -0.011*** | -0.010*** | -0.009** | -0.009** | -0.010*** |
| Standard error of regression | 0.0184 | 0.0184 | 0.0220 | 0.0221 | 0.0184 |
| Adjusted coefficient of determination | 0.9958 | 0.9958 | 0.9940 | 0.9916 | 0.9941 |
| Durbin – Watson statistics | 1.88 | 1.88 | 1.14 | 1.25 | 1.91 |
| Akaike information criterion | -5.03 | -5.04 | -4.70 | -4.69 | -5.04 |
| Schwarz criterion | -4.75 | -4.79 | -4.49 | -4.48 | -4.79 |

*, **, *** significant at 90%, 95% and 99% respectively.
Coefficients that has not estimated directly but derived from other coefficients are underlined.
**Source:** author's calculations.

Comparing equations (4) and (6) we can see that total factor productivity is highly correlated with private capital, therefore including exogenous technical progress in equation (4) does not lead to undervaluation of public capital productivity. Regarding the role of private and public capital in affecting labour productivity, equation (7) and (8) in table 2 show that at least a part of technological progress could be regarded as "doing by learning" externality from the private capital accumulation, but this hypothesis does not hold for public capital. Nevertheless, equation (8) shows that both private and public capital raise labour productivity significantly and again, public capital is much more productive (1.7 times) than private capital. Regarding $\alpha_L$ term inclusion of which tests for variable returns to scale, it appeared to be significant in the equation (7; not shown here), but insignificant in equation (8): labour positively correlates with technological progress but there is no indication that constant returns to scale do not hold in respect to labour input (which represents the size of the economy).

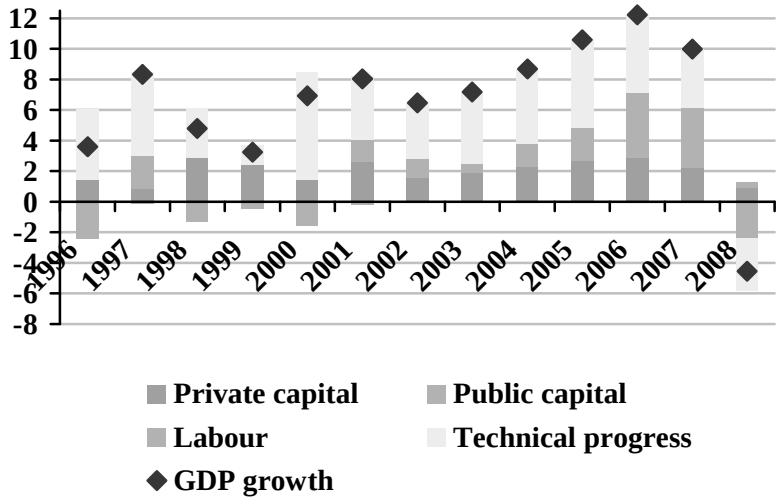
Multiplying estimated elasticities from equation (4) in the table 2, by average growth rate of the respective production factor, we obtain this factor average contribution to economic growth in Latvia. Figure 4 shows that during the last 14 years the driving forces of economic growth in Latvia were total factor productivity (69.8%) and private capital (26.2%), moreover, also labour and public capital contribution was positive.




**Source:** author's calculations.

**Figure 4.** Private capital, public capital, labour and total factor productivity contribution to economic growth in Latvia 1995-2009, %

Figure 5 shows that during 2001 – 2007 production inputs as well as total factor productivity contributed positively to economic growth in Latvia in each subsequent year. Moreover, an economic downturn in 2008 is mainly attributed to total factor productivity (here it includes the cyclical impact, which was excluded in regressions by three additional variables).




**Source:** author's calculations.

**Figure 5.** Private capital, public capital, labour and total factor productivity contribution to economic growth in Latvia, annually 2001-2008, percentage points

## Conclusion

The paper estimates private and public capital contribution to economic growth in Latvia 1995 - 2009 using production function approach. Due to lack of capital formation data, both private and public capital levels were estimated, the initial share of public capital stock came from national accounts; for subsequent quarters, public and private investment and previously accumulated capital stock depreciation were used to construct capital stock tome series. On average, private capital stock was 7.8 times higher than public capital stock and increased gradually whereas public capital stock decreased until 2002 and raised rapidly afterwards. It was found that both private and public capital has positive and statistically significant impact on economic growth and labour productivity, public capital is 1.6 times more productive than private capital; nevertheless, private capital accumulation affects technological progress through "learning by doing" externality. It was shown that the main driving forces of economic growth in Latvia 1995 - 2009 were total factor productivity and private capital formation, moreover, labour and public capital contribution was also positive. It was pointed out that if economic growth is constrained by demand factors, which

is the case of Latvia at the end of the sample, production function estimates do not fit the data well and autocorrelation problem arises. Therefore the production function should be augmented with additional variables that feature the cycle.

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# MODELING THE FISCAL IMPACTS CAUSED BY CLIMATE CHANGE

**Gábor Kutasi**[1]

A forward-looking perspective is always useful in policymaking,
and it is especially useful for fiscal planners.
Peter S. Heller (2003:10)

## 1. Introduction

The Brundtland Report on sustainability of development issued in 1987 has early explained the responsibility of human activities for transition of natural environment. Peter S. Heller's book, the 'Who will pay?' (Heller 2003) can be called one of the first mile stones in thinking about fiscal impacts of long-term processes of the 21st century global economy, as the climate change among others. Since the 'Who will pay?', the particular specified economics literature has been enlarging.

This study overviews the public finances aspects of climate change. The sustainability is in focus, but this time the fiscal one and not the development aspect. The purpose is to gather the practices and to model the impacts of climate change on fiscal spending and revenues, responsibilities and opportunities, balance and debt related to climate change.

The horizon of global problems and regional social changes in the 21st century demands more long-term, forward-looking awareness and planning from national governments. Heller (2003) named the demographic changes, the global climate change and the globalization as main channels of very long-term challenges. These processes open new dimensions, also, in fiscal planning by causing cost of anticipation, mitigation, adaptation or other way of treatment.

In most of the industrialized countries, there are many factors ruining fiscal sustainability beside the climate change costs. The aging population, the welfare state reform, the recovery from global crisis, the tax competition, the rigidities of labour markets already have resulted robust debt levels. (The approximately debt to GDP ratios have been the followings in 2011: USA 100%, Japan 225%, France 80%, Germany 75%, Britain 70% etc. source: Eurostat) The determining debt level warns for an important constraint in the beginning: The fiscal cost of mitigation and adaptation can not be financed simply with public debt.

It is preferable to examine the impacts of climate in the fiscal environment drafted above. Nevertheless, the climate change is an expected occurrence in the future of the 21st century, which depends on many factors. This uncertainty or probability creates a more complex challenge for fiscal strategy. The regional variability of extent of warming or frequency and intensity of extreme weather events (cyclones, hurricanes, storms) or importance of coastal rise in the sea level still increases the complexity of fiscal analysis.

The mitigation and adaptation to climate change means any private or public action to prevent the change of temperature or adjust to a changed climate. Aaheim & Aasen (2008) distinguish autonomous and planned ways. The autonomous adaptation is the case, when private individuals do something for adjustment in uncoordinated way. This could have been a cheap way for public finances, but also results suboptimal solution because of bias for individual free riding, emergence of common pool resource problem, or uncertainty. That is why planned adjustment, namely fiscal adaptation is necessary, too, to motivate the private sector for (pro-)action. Nevertheless, the autonomous adjustment also has impact on tax revenues and public transfers. E.g., energy saving means less pollution-related tax payment, or direct investments in renewable energy equipment can create right to get public subsidy.

To adopt the debt sustainability aspect into the frame of climate change aspects, the long-term solvency, the budget constraint, the primary gap indicator has been applied. Besides indebtedness, refocusing fiscal spending and resetting the extent of public budget invoke the Keynesian fiscal crowding out impact.

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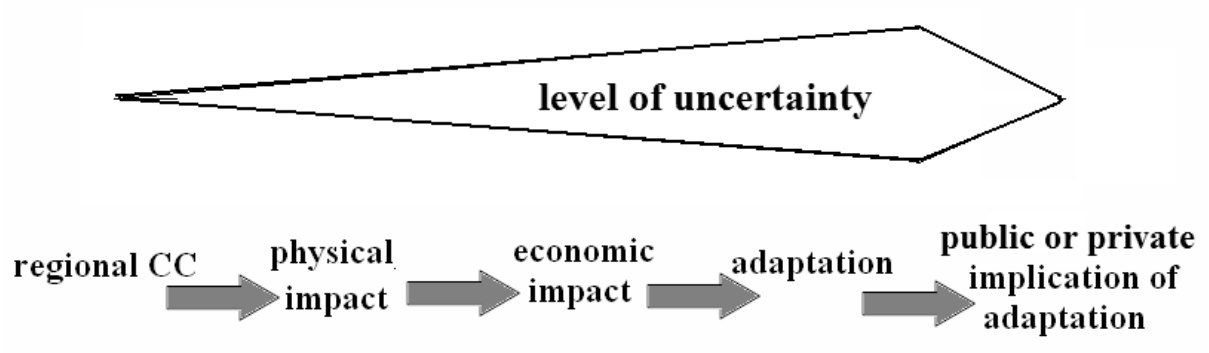
The paper was sponsored by TÁMOP-4.2.1.B-09/1/KMR-2010-0005

## 2. Methodology of climate change

As a methodological simplification, the climate change can be translated as significant shift in average temperature, thus there is a variable or factor for calculations.[1] The modeling of fiscal impacts shall be examined in the frame of temperature change causing damages or benefits, and cost of mitigation or adaptation. If climate change got realized globally, it does not mean a generally same extent of change of temperature in every region and territory of the Earth. (It is possible more or less warming in temperature or even cooling is a likely outcome in certain regions.) As warming may be so different, the physical impact can be various. In some region, the rise of sea might will take costal territories, in some region the hart illnesses might will rise by warmer climate, in other territories the agricultural lands will dry out, somewhere else the disappearance of ice and snow create land cultivation opportunities or ruin the winter tourism etc. But what is the likelihood in a continent, a country, a county or a city/village level? If there are more scenarios, what are the effective mitigation and adaptation actions? What is the critical mass or scale of action? Will the actors wait for each other to act? Who should act first? Should the state intervene, motivate, initiate? And so on. If such uncertain probabilities are accumulated (namely multiplied), finally the likelihood of effective actions can be low. (see fig. 1 and fig. 2)




**Source:** Simplified adaptation from Stern (2007) and O'Hara (2009)

**Figure 1.** Increasing uncertainty in climate change (CC)

Heller (2003:19) refers to the IPCC (2001) projections on expectable change of temperature in 100 years term horizon, which forecasts 1.9 – 5.8 Celsius (3 – 10 Fahrenheit) gradual warming by the concentration of greenhouse gases in the atmosphere. The uncertainty of temperature change can be illustrated in a fan chart of probable further future expectations.

Besides high uncertainty, the economic actors should agree in the distribution of financing between public and private players. The economic motivation for participation can be established, if the participants can get at least so much benefit from mitigation and adaptation actions as much cost they invest. Nevertheless, there are private actors (or maybe even state actors in the international relations), who are not able to finance themselves the adaptation. Thus, the public decision makers must determine the extent of equity toward poor economic actors. (CEPS & ZEW 2010) This aspect raises the equity vs. efficiency trade-off dilemma, whether the fiscal resources should be used for subsidizing rich or poor actors (by direct spending or tax refunding). To resolve the dilemma, the economic theory knows the utilitarian approach and the Rawls approach. In case of climate change mitigation, the specific carbon emission per household of different social groups can guide the balancing between equity and efficiency. However, equity is not just a dilemma in social classes dimension, but in geographical view, too. Which are the populated and industrial areas deserving protection against higher sea level or other natural damages? See the bad practice case of New Orleans in 2005. How well developed hurricane warning system has it done worth to be financed? How big efforts and how quickly has it done worth to save people right after the catastrophe? Or see the Dutch agricultural lands under the sea level. How far should they be protected? Do these lands produce enough income to protect them from the sea?

The policy making – in relation to market motivation – must decide another dilemma between short-term profit and long-term supply what can be called supply security dilemma. (CEPS & ZEW 2010) In

[1] The estimation of global and regional probability, extent and direction of temperature change is a natural science question, thus in public finances study, it will be treated as an external factor.

which territories should the state sustain the supply of energy, food, transportation, safe water and sewage system, pipelines? The prices and the (in)elasticity of the (network) service markets, the intensity of destructive competition[1], will decide the short-term profit. When the profit is negative, the state may force the service companies to supply – or maybe not.

In case of climate change, the likelihood of irreversibility is important determinant. Although an early mitigation action can look like unworthy because of high uncertainty and low probability of occurrence of damages far before the forecasted warming or disasters, an overdue mitigation can not reverse the natural, environmental changes. In this case, only adaptation remains as option. (CEPS & ZEW 2010) The economics of decision theory suppose to use the net present value (NPV) to choose the more worthy option. In climate change relation, the comparable options are the NPV of an earlier mitigation or the NPV of a later adaptation.

To estimate the fiscal costs, the market capacity, propensity and perfection is preferable to be examined. It should be estimated, how far can the government levy the burden of adaptation on the private sector (solvency, marginal proactive propensity etc.), and can the market manage the risk to have demand and supply to meet and avoid the market failures. In climate disasters, first of all, the insurance sector should be helped to be able to manage the risk as far as possible.

To treat the impacts of climate change, it is possible to mitigate, what – according to Heller (2003:25) – means much effort *devoted to reducing emissions of greenhouse gases*.

*Here public sector involvement may involve replacing existing taxes with new ones that promote reduced emission. Or there may be more active use of regulation, whether of the command-and-control or the market-based type […], in which case the fiscal consequences are likely to be more limited.* Heller (2003:25)

If mitigation is too late, or it is too expensive for preventing a not too likely event, the adaptation to new/changed circumstances can be another response. According to Heller (2003:23), the extent and cost of adaptation is regional or country specific, as it depends on the intensity of climate change, the embodiment of environmental or geographic changes, and the side effects on economy and physical assets. Heller thinks the followings:

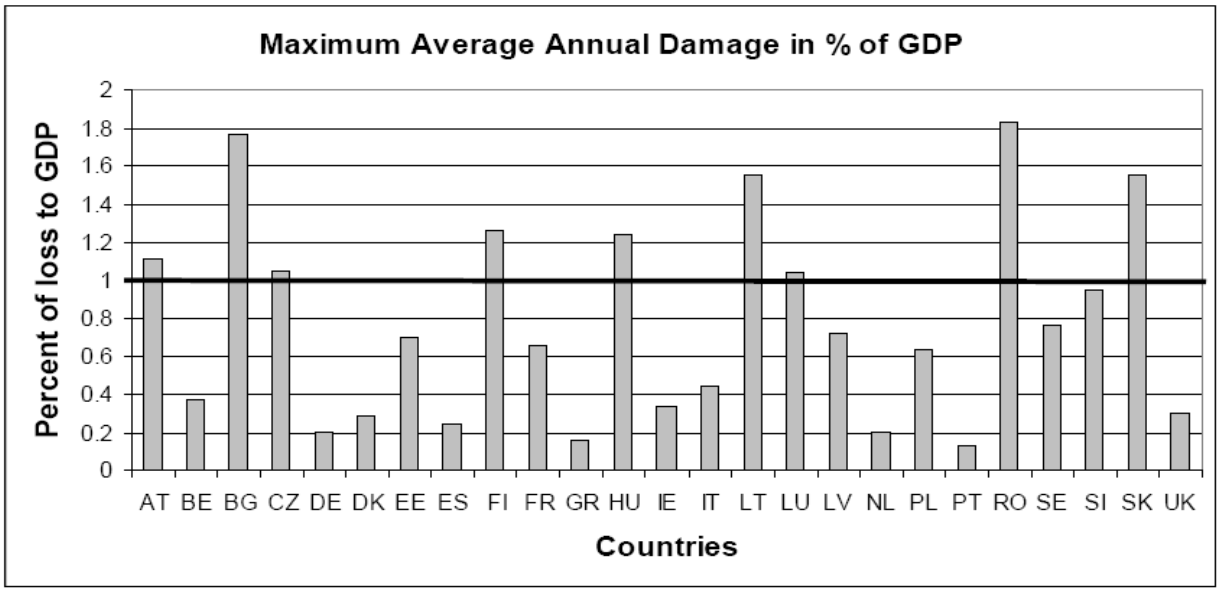
*Although much of the burden of relocating resources and financing new investment will undoubtedly fall on the private sector, it is unlikely that the public sector will remain unscathed, especially in countries, such as many developing countries, where the net economic impact of climate change is expected to negative. Areas of potential public sector involvement include outlays on infrastructure […], other public goods in the areas of disease prevention and agricultural extension and research […], and subsidies (to facilitate the resettlement of population).* Heller (2003:23)

As the significant warming is forecasted for century long, the public fiscal intervention is far more necessary in case of produced capital stocks, buildings, physical infrastructure with lifetime over 50. Especially, if unexpected or unlikely, radically destructive disasters or abrupt changes cause high scale of short-term cost.

The methodology on surveying fiscal impacts by climate change distinguishes fiscal cost of mitigation and adaptation, besides direct and indirect costs. It also introduces cost benefit analyses to evaluate the propensity of policy makers for action or passivity. Scenarios shall be drafted to see the different outcomes. The scenarios shall contain the possible losses in the natural and artificial environment and resources. Impacts on public budget are based on damage of income opportunities and capital/wealth/natural assets. In the followings, there is a composed list of actions when the fiscal correction of market failures is be necessary.

When fiscal cost of climate change is under survey, two main type of cost, the direct and the indirect costs can be distinguished. The direct costs are easily identifiable, however it is assumed to be smaller part of total costs. The difficulties with the identification of indirect costs alert for efficiency challenges, because the transparency of total cost of adaptation gets deteriorated. If costs are not transparent, economic participants will not be willing to finance it or support it, thus, the absent funding ruins the efficiency of any actions. The mechanism of direct and indirect costs can be described by the model on drivers of fiscal impacts.

[1] Destructive competition: In such service markets, (1) where the fix cost (exit cost) is high, (2) the competiton is intensive and presses the price to low level and (3) the demand is very volatile (some times much, some times few), the three characteristics together cause frequent bankruptcy what endangers the supply security.




**Source:** CEPS & ZEW (2010:55, fig.3.4)

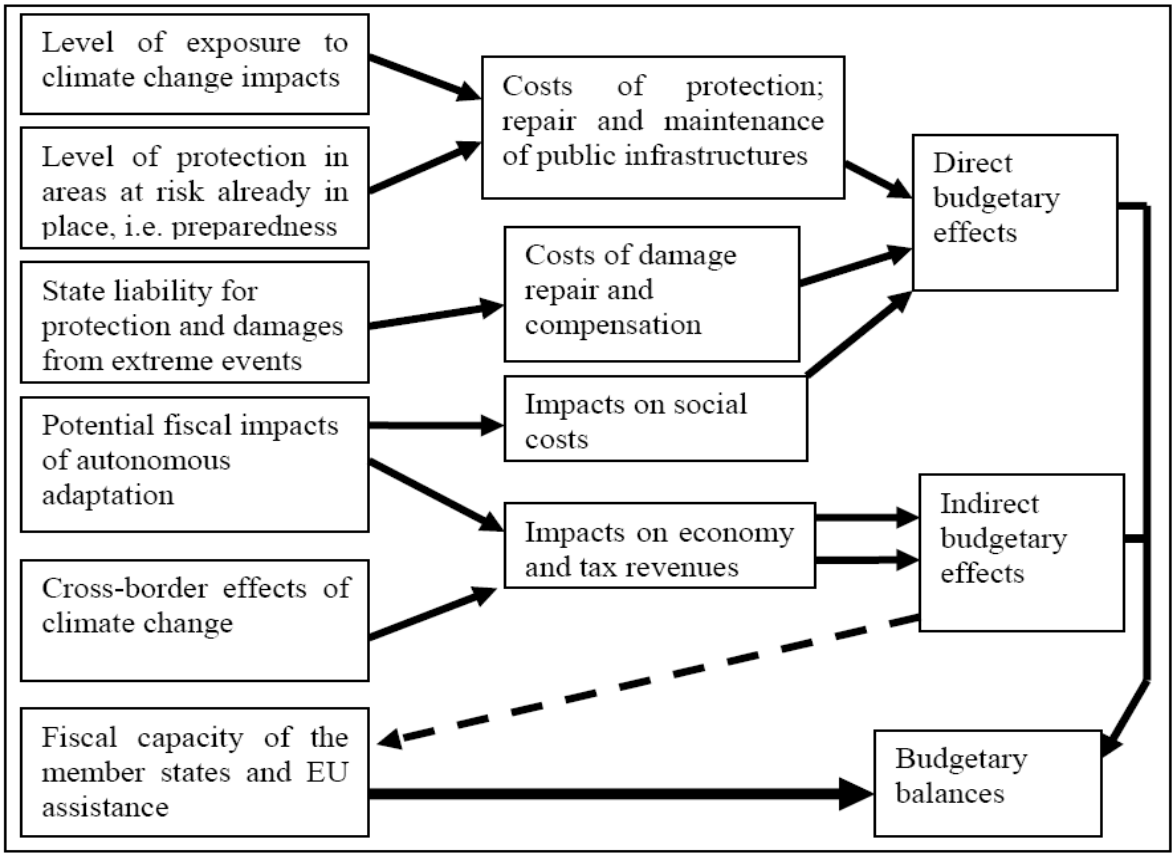
**Figure 2.** Example for uncertainty: does it worth to have protection against flood?

## 3. Modeling the impacts

In the model on drivers, the CEPS & ZEW (2010) gathered the fiscal implication of climate change and identified six drivers that determine the size and importance of the fiscal implications. These are the followings: (1) the degree of exposure to gradual and extreme climate events; (2) the level of protection already in place in areas at risk, i.e. preparedness; (3) the state's liability for damages; (4) the potential and impacts of autonomous adaptation and remedial actions; (5) the cross-border effects of climate change; and (6) the fiscal capacity of the member states and the role of the EU.

The mechanism of drivers is illustrated in Figure 3, below. Direct fiscal costs are the construction and maintenance of protective infrastructures, the additional maintenance of public infrastructures affected by climate change, the changes in social expenditures mainly from potential repercussions on employment or alterations in health expenditures. A certain type of direct "cost" can be the revenue changes of the budget because of shifts in the economic and trade structure or in the consumption. The indirect fiscal costs appears as impacts on fiscal capacity to deal with very long-term challenges, like climate change, by definition of CEPS & ZEW (2010:52).

The degree of exposure means the above mentioned region-specific characteristics related to local geography, climate and location in climatic belt. (E.g. average temperature, rainfall, coastal facilities etc.) The level of protection means the existing infrastructure for protecting or monitoring and early warning systems against natural disasters endangering lives and economic values, extreme weather conditions endangering human health. High level of existing protection saves a lot of investments for the budgets in the future. However, it has been meaning a high level of permanent operating cost to keep the condition of systems and edifices. Early mitigating investments and intensive technological developments can reduce such type of cost factors. State liabilities for damages are any type of promise of state or expectable aid and help from the state which are paid or financed for victims of natural catastrophes, or financing the natural disaster relief. To reduce the scale of such liabilities, sophisticated and well developed private insurance sector is necessary, and thus the public support for its development is recommended.




**Source:** CEPS & ZEW (2010:52, Fig.3.2)

**Figure 3.** Drivers of impacts, various national concerns

Autonomous adaptation as driver of fiscal impacts represents the cooperative, initiative and supportive propensity of the private sector individuals. The actual occurrence of autonomous adaptation is the result of private utility-maximization objectives and their assessment of risks. The cross-border effects as impact drivers include two types of cost factors. One is the residual costs from actions in another country, the other type is the aid transfers for developing countries to adapt to climate change, or technology transfer to mitigate. Fiscal capacity as determinant of scale of spending for mitigation and adaptation shall be understood in dynamic approach. Not only the given balance of revenues and expenditure matters, but the potential changes of them do, too. This is called fiscal flexibility what means the taxation and spending room for maneuver of the fiscal government, the realizable potential scale of change of tax burden and expenditure by discretionary decisions. Standard & Poor's rating agency has even developed an indicator, the Fiscal Flexibility Index with sub-indices such as Expenditure Flexibility Index and Revenue Flexibility Index. (See Standard & Poor's 2007a and Standard & Poor's 2007b.) The fiscal flexibility can be extended through – first of all – the minimized indebtedness, the economic growth friendly economic policy and the lower scale of public finances, namely, lower total tax burden and public spending intensity with same balance. (Benczes & Kutasi 2010:95)

Generally, the cost impact of the drivers can be reduced by technological (R&D) investments, supranational provision and assistance, internationally integrated financial and technological resources, expansion of insurance market, regulation of land and water use, information provision for awareness, direct fiscal incentives to help individual actors for autonomous mitigation, review of state liabilities. (CEPS & ZEW 2010:59-62)

As mentioned above, fiscal impacts can be derived from the economic impacts which are preferable to be anticipated by the economic actors. Such general impacts are the average temperature in the seasons, along with an expected rise in temperature extremes; precipitation patterns; snow cover; water systems – particularly river flows (flood and drought risks) and groundwater levels; and coastal regions – with sea level rise and flood risks.

The following economic and natural impacts are expectable, what might demand autonomous and/or planned adaptation. (UNFCCC 2007, World Bank 2009, Fischer et al. 2007, Bosello et al. 2009, Bräuer et al. 2009)

- In the agriculture, change in cultivation to more thermophile plants, redesigning drainage systems, building and reconstruction droughts, rethinking short land tenancy period, earlier seeding, potentially an additional crop rotation, expanding variety of crops and plants, developing of new crop types, increased use of fertilization and plant protection; water-saving cultivation; development of plant and animal disease and pest monitoring; new insurance regulation;
- In the forestry, the needful actions: control of pests and diseases; enhance resistance of forest by mixed stands; earlier evacuation of trees after pests damage; forest fire and related monitoring system; rapid harvesting after wind damages; forest transformation to higher diversification of tree types;
- In health sector, the heat stress, vector-born diseases, increasing use of the health service capacity.
- Water related factors are the floods, heavy rains, coastal sea level, droughts, ice accidents, fertilizer in water reservoirs.
- Tourism related impacts: less snow for winter sport, algal blooms, sea level, hotter or longer summer periods.
- Energy sector related impacts are less heating, more cooling, unreliable water transport, limited water cooling, better temperature for biomass, increase in precipitation, power cable damages, changes in wind velocity, research demand.
- Transportation related impacts: drainage, resisting capability of infrastructure, risk of accidents by hot weather, erosion and flood damages, shorter ice and snow period, dried canals.

According to CEPS & ZEW (2010) the following type of fiscal cost impacts can be derived from the economic and natural impacts of climate change:

- Incentives for innovation and technological development
- Agricultural subsidies for guiding to new climate, and compensation for loss of agri-lands by desertification or higher sea level.
- Relocation of infrastructure in coastal areas and building protective infrastructure (e.g. dykes)
- Restructuring tourism and energy sector and related transportation systems
- Compensation for lost real estates taken by the sea or nationalized territories for relocated infrastructure
- Adaptation cost of public buildings
- Cost of monitoring and providing early warning information
- Cost of health problems caused by changed climate
- Restructuring of employment
- Damages by natural disasters
- Compensation of poor part of society

The tax impacts can realize in the tax revenues depending on income and energy consumption. The transparency of carbon pricing in taxation will also determine the energy consumption propensity, thus the energy related tax revenues.

## 4. Climate change as one of the fiscal sustainability factors

As it was written by Heller (2003), the public finances are challenged by long-term structural problems like aging population, sharp increase of population in emerging and the least developed countries, health and disease problems, technological change, globalization of capital, labour and consumer markets, and of course last but not least the climate change.

Before mentioning any practical issues of public financing, there is a theoretical frame what must be taken into any account. Namely, sooner or later any public expenditure must be covered, otherwise debt crisis is expectable. To avoid the default, budget constraint is guiding principle, which means that the present value of future expenditures and revenues and the liabilities accumulated in the past should be in balance. (Benczes and Kutasi 2010)

$$PV(\text{debt} + \text{future expenditures}) = PV(\text{future revenues})$$

If the budget constraint is continued through the findings of Fatás et al. (2003), Grauwe (2000), Buiter and Grafe (2004), Chalk and Hemming (2000), the affordable deficit can be concluded from the budget constraint:

$$\Delta b = g - \tau + (r-n)b - m,$$

where $\Delta b$ is the change of debt in % of GDP (namely, the budget balance), g is the public sending in % of GDP, $\tau$ is the tax revenue in % of GDP, r is the real interest rate, n is the growth rate of GDP, b is the debt to GDP ratio, and m is the seigniorage revenue. This constraint still can be fined with overlapping generation aspects (see Zee 1988) and with crowding out impact (see Tobin and Buiter 1976, Bagnai 2004).

To evaluate the fiscal room for maneuver – e.g. before raising the green spending, – there is opportunity to form sustainability indicators from the budget constraint. A generally used one is the primary gap indicator by Blanchard (1990).

$$\tilde{d} = (n_t - r_t)*b_t$$

and

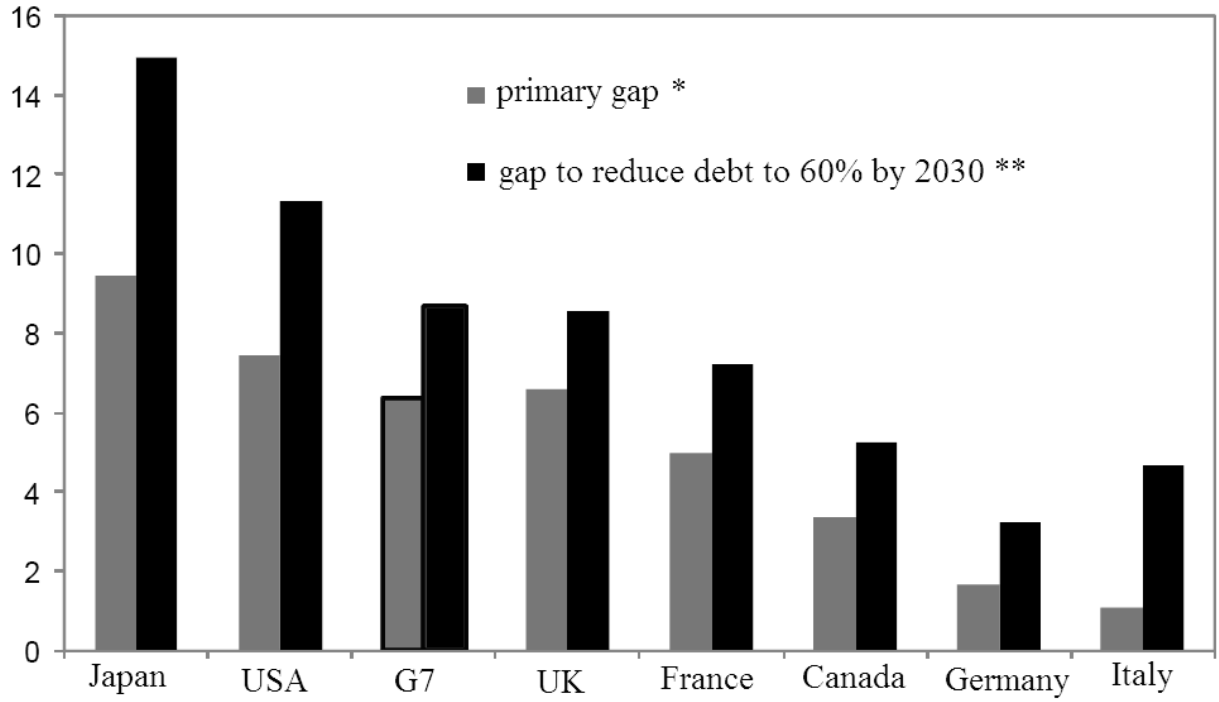
$$\tilde{d} - d_t = (n_t - r_t)*b_t - d_t$$

where $\tilde{d}$ is the primary deficit, $d_t$ is the realized general budget deficit, , r is the real interest rate, n is the growth rate of GDP, t is a given year. If $\tilde{d} < d_t$ , there is excessive budget deficit which destabilize the public financing. Real interest rate is calculated from the Fisher equation:

$$1 + i = (1 + r) * (1 + \pi),$$

where i is the nominal interest rate, $\pi$ is inflation.

$$r = [(1+ i) / (1 + \pi)] - 1$$



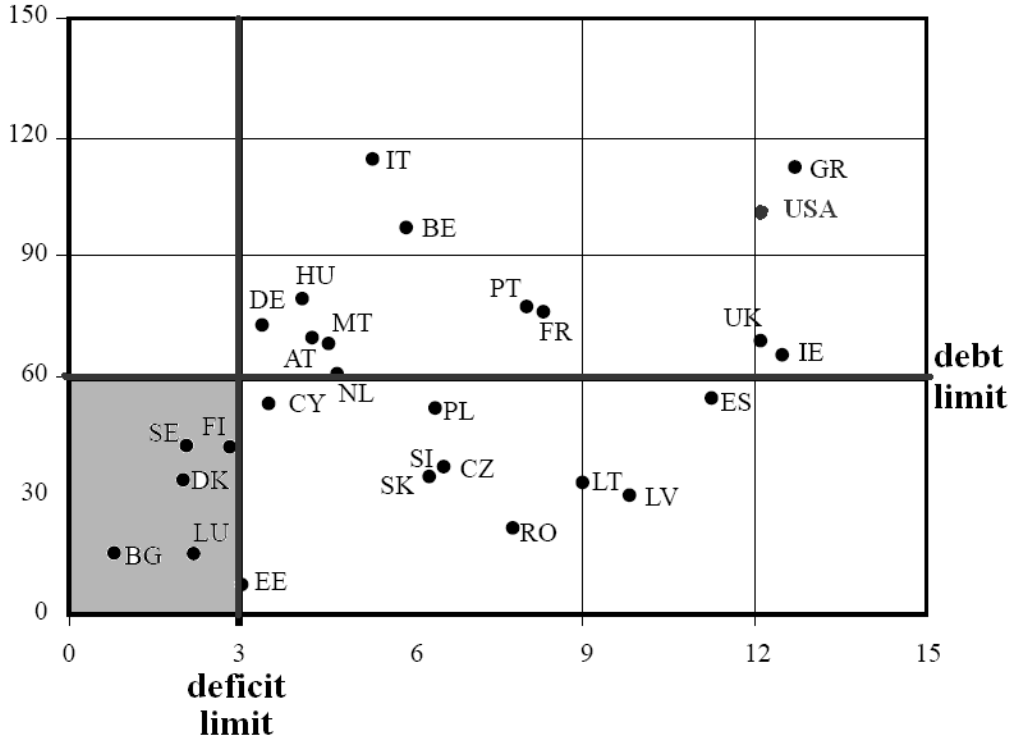

**Source:** IMF *Staff Position Note* SPN/10/13 (Long-Term Trends in Public Finances in the G-7 Economies) Fig. 7., p. 14, based on IMF *Fiscal Monitor* May 2010, IMF *World Economic Outlook* July 2010 Update, and IMF staff calculations and estimates.

* The primary gap is the difference between the primary balance for 2011 that is needed to maintain the 2010 debt-to-GDP ratio and the cyclically adjusted primary balance (CAPB) in 2010.

** The scenario assumes that the CAPB improves gradually from 2011 to 2020; thereafter, the CAPB is maintained constant until 2030. The CAPB path is set to reduce the debt-to-GDP ratio to 60 percent by 2030. For Japan, a gross debt target of 200 percent of GDP (net target of 80 percent of GDP) is assumed. The scenario uses country-specific interest rate–growth differentials.

**Figure 4.** Primary gap in G7 countries, 2010, %

As it is clear from the crude data of figure 5, and the primary gap indicator in figure 4, most of the high developed countries have trouble with the general budget balance. Besides, the primary gap indicator even represents a longer term fiscal adjustment period necessity for these countries. Especially the big key economies (USA, Japan, Germany, France, UK) must face to drastic return to balance during decades after many years of fiscal stimuli. The global crisis of 2008-2010 caused a serious turmoil in many EU states' public finances. Only six EU countries could keep the deficit criterion in 2009 (see graph 1.), four of them (Sweden, Denmark, Estonia, Bulgaria) have not introduced the euro. The other countries have diverged both in debt and deficit. Since 2010, during one and a half year many euro zone countries had difficulties in debt financing (Greece, Portugal, Ireland, Spain). Some euro zone members also have got closer to non-credible indebtedness (Italy, France). In USA, the solvency gets also questionable in the middle of 2011 because of political disputes on debt ceiling. Big countries budgetary troubles spill over to their economies and to partner economies, thus causing them fiscal troubles, too. Such a global situation is not favourable for quick fiscal adjustment to the challenge by climate change.




**Source:** Eurostat

**Figure 5.** Fiscal sustainability problem of EU and USA.
Fiscal impact of crisis on debt (vertical axis) and deficit (horizontal axis) in 2009, % of GDP

In case of a new type of spending forced by external natural factors, just like the prevention or damages from climate change, the sustainability question can be composed also as a dilemma of hard or soft budget constraint. Hard constraint means budget balance beside restructuring of expenditures or tax revenues increasing together with spending. Soft constraint means unilateral rise of spending what results higher overall deficit. (Kopits 2000) The hard constraint is not attractive for political deals. The soft constraint causes increasing default risk. If sustainability is a primary objective, soft budget constraint is not an option, however political deals can frequently overwrite the economic rationale.[1]

Besides, any case of increasing scale of public budget, also because of green spending or taxes, raises another policy dilemma. Namely, does it worth to strengthen the fiscal crowding out impact? (Tobin & Buiter 1976) The increasing spending (indifferent whether form tax revenues or debt) results higher market interest rate as cost of credit. The increasing public spending turns the private investments and consumption to be declining. This crowding out impact will be important, also, to explain why the private sector becomes more and more passive in mitigation and adjustment when high government activity is

[1] About political factors of fiscal decisions see the literature represented by A. Alesina, R. Perotti, G. Tabellini, T Persson, J. von Hagen, etc.

observable. So not only free riding is behind the passivity of the private sector, but crowding out can be another explaining factor. The extent of any crowding out will be determined by the elasticity of money demand, the capital income to total income ratio, the wealth to out-put ratio, the level of taxation and interest rate and the speed of growth.

## 5. Fiscal policy dilemmas related to climate change

Through the recognition of indebtedness of highly developed (and climate sensitive) countries, the climate dilemmas of public finances can be worded. The first dilemma is the following: As there is no satisfying room for issuing more debt to cover the fiscal climate adaptation, the two options for fiscal policy are the redistribution among the items of taxes and spending or levy as much cost as possible on the private sector through perfect markets, like a sophisticated insurance sector. However, the two horns of the dilemma demand challenging balancing. If the private sector with limited time horizon got no fiscal (public) impulse at all, the private perception on net present value of adaptation will be considered to be negative, as individuals of the private sector can not optimize for the endless future, or more then a few generation. (See the paradox of Ricardian equivalence.[1]) In the contrary case, getting excessive fiscal subsidies, the community of individuals of the private sector will expect any adaptation from the state, thus remain passive.

The second dilemma rooted also in the limited room for issuing debt. The fiscal decision makers are forced by indebtedness to select among private actors, and create preference lists. Who should be compensated for damages, and who not? If rising sea level swallows coastal real estates, should the owners get subsidies, and how much? If productivity of agricultural lands were ruined by desertification, should the state bother with ensuring alternative income for rural workers and entrepreneurs? Should the ski parks get public or EU subsidies for snow guns if climate warming means too high temperature for snowing? etc.

The increasing green tax burden, bond issue and funding for mitigation and adaptation raises the dilemma whether does it worth to increase the fiscal crowding-out effect in the capital markets or not. This effect is very regional market specific because of the interest rate elasticity and marginal propensity of saving and investment. Of course, less investment can mean less carbon emitting production growth, but also slower technological development in carbon reduction, too.

Heller (2003:120-150) recommends conceptual aspects for long-term fiscal planning to finance long term mitigation and adaptation to any sustainability problem. Certain aspects are the limits or "stop sign" for certain ways of adaptation. First of all, the public financing has social welfare function, namely, the support for more vulnerable groups in the society. The climate change enlightens, too, that decisions makers should take into account the interest of the future generations as one of the most vulnerable group. Thus, the aims of policy making shall contain the objective of achieving fairness across generations, what means excluding Ponzi games[2] in budgeting, counter-weighting short-term political interest and eventually a kind of self-limitation in long-term borrowing for financing current outlays. The necessity of self-limitation rotted in the political economy recognition that there are individual interests behind the decisions, the principal-agent problem is an existing occurrence in public policy, and short-term interests are overweight, long-term interests are underscored in discretionary decisions. Institutional solutions, like fiscal rules, fiscal councils can improve the transparency and suppress political myopia, thus, treat the political obstacles.

Besides, the government must be able to assess correctly and ensure the financial sustainability, namely, the long-term public solvency. Sustainability means not only focusing on budget balance, but also, the sustainability of the tax burden, the adequate risk management on fiscal threats and weaknesses, the sus-

[1] In the economics models, it is a reasonable assumption, that the states as actors are immortal, so they should be considered as infinite ones. That is why, the Ricardian equivalence can presume, that it is indifferent for the state to finance a new item of spending either from raising tax or from public debt. If it was true, this aspect gives opportunity for infinite Ponzi game for states, and just always accumulate higher and higher debt by promising higher and higher future tax revenues. However, O'Conell & Zeldes (1988) and also Buiter (2004) emphasized, that it is not possible because of the finite or limited horizon of individual households as buyer of public bonds. As the buyers are thinking in finite future and they are in limited number, the assumption of public bonds with infinite maturity is unrealistic. Besides, the imperfection of capital markets can not treat perfectly the uncertainty of the future. That is why it is expectable from the state to pay all the debts in the unseen future, namely what is expressed in the form of

PV (debt + future expenditures) = PV(future revenues).

[2] About Ponzi game in budgeting see more in Buiter & Kletzer (1992)

tainable institutional mechanisms to ensure the far future balance, and the limitation on future policy makers' discretionary decisions. The decision makers must preserve the scope for stabilization measures, even though they prefer to use the fiscal policy as an instrument for having influence on the economy. The efficiency of allocation for Pareto efficient income production means practically the elimination of distorting effects in tax system, the distribution of spending in optimal structure referring to the equity vs. efficiency trade-off, and the suppression on red tape concerning the public finances. Of course, not just the present, but the legacy of fiscal policy will disperse the position of countries or regions. Simply, the fiscal legacy can be expressed in the current scale of public debt. And not only the extent of debt, but its structure will matter, since in dynamic view, it can be the root of suddenly intensifying side effects. For example, indebtedness in foreign currency can modify significantly the solvency of debtors in a foreign exchange rate shock without short term risk management instruments. (Such impacts are called nonlinearities by Heller (2003:149).)

According to Heller (2003), state must be ready to anticipate market reactions driven by short-sighted interest. Private sector's propensity for funding or resource saving can determine crucially the effectiveness and scope of public policy actions for adaptation. The governments must think about market side effects of the structure of realizing the long-term sustainability. Will the market help or weaken certain stimulating or restricting actions? What will be, for example, the effect of lower or higher risk premium on private savings and investments? E.g., it is well known about debt crisis impacts, that when the direct danger of collapse get milder the private interest groups get less devoted to public finances reforms, so, the politicians will ease the previous restrictions and deteriorate the previously improved fiscal balance or balancing program.

The items mentioned in the followings and serving the green adaptation causes structural changes in public finances. This aspect supposes to treat the green reform, also, as a structural fiscal reform together with balancing. The simplest way to move toward fiscal balance is, when the incomes grow faster than the expenditures in absolute share. Thus, at once, the collapse of economic growth dynamics can be avoided.

That means, the absolute growth of tax burden should be lower than the GDP-growth, and comparing even to tax increase, the growth of public expenditures should be much lower. However, this demands the public green spending not to be automatic, because the rigid expenditure types insensitive for business cycles will make the adjustment of spending unmanageable to the governmental solvency. Nevertheless, the tax incomes can not be decreased until the expenditures will not decline at least in the same scale. Besides, the expansion possibility of state debt means also limit in the play of tax reduction. (Tomkiewitz 2005)

The green reform basically is making an attempt to increase the net present value achievable through the fiscal policy, explained with the instruments of cost-benefit analysis is the following:

max PV {benefit of society – cost of society}

However, this cost-benefit analysis is fairly complex, that is why the results must be treated carefully to avoid misleading understandings. First of all, it is hard to measure any side effects of public expenditures and absorption. During the estimation of benefits the experts must face the comparison problem, how commensurable are the individuals' subjective utility. Wildawsky (1997) guess, the appraisal methods used in practice are very uncertain – at least in case of public services. The net present value calculation is uncertain in dynamics, as the costs can vary in the future. (Kutasi 2006)

The structural green reform of public finances is not simple corner-cutting or spare of expenditure targets. Any kind of efficiency-seeking restructuring related to revenues or expenditures can be mentioned under this category that will have a positive long-term impact for years or decades. In certain circumstances, the previous level of expenditures can be held. The essence of reform of public finances is, that the previous financing mechanisms get changed or reorganized to create more efficient structure independently form the current budget deficit or surplus.

In Drazen's (1998) approach, the fiscal reform is a common pool. Everyone consider this common pool to be made, but everyone wants it to be financed by others. This way, the possible utility created by a possible reform for everyone is in vain if there is high probability for burdening the cost on the certain individuals. This will be a 'war of attrition' impact on the reform, as most of the individuals will not support it. Moreover, the distribution of costs means actually a dispute on distribution of tax burden in the planning stage of restructuring, what will impede more the execution. Besides, the support of reform will be ruined much more in case of uncertainty of individual benefits. Many researches were made to find relation between the success of reform execution and the political institutional system. (see e.g. Strauch & von Hagen 2000, von Hagen, Hughes-Hallett & Strauch 2002, Alesina & Perotti 1999, Poterba & von Hagen 1999, Benczes 2004, Benczes 2008 etc.) These surveys concluded that mostly the plurality of decision makers, the pressure for consensus or the multi-party government usually weaken the fiscal discipline as

well the not transparent budgeting procedures or the strong bargaining power of spending ministers against financial minister. Although, the political and multi-party system can not be question of restructuring, making efforts for transparency of budgeting procedure and dealing can do a lot for disciplined public finances. (Kutasi 2006)

## 6. Fiscal risk management of climate change

The general risk management of sustainable budgeting has broad range of instruments with many experience of practical implementation. The fiscal rules have became often used since the 1990s. (See Kopits 2001, Kopits & Symansky 1998, Kumar et al. 2009, Benczes 2008, Benczes & Kutasi 2010:122-144) The different types of rules are the balanced budget rule[1], the public debt rule[2], the golden rule[3], the expenditure rule[4]. These rules are useful to restrict the short-sighted political decision makers in discretionary decision enforcement.

Besides rules, revising bodies can be established, which are typically called fiscal councils or fiscal boards with right to publish opinion, or, maybe, to veto on fiscal related decisions. Numerous example can be mentioned: the U.S. *Congressional Budget Office*, Dutch *Budget Inspectorate, Budget Directorate* (Blöndal & Kristensen 2002) and *Centraal Planbureau* (Debets 2007), the Belgian federal *High Council of Finance* (Buti et al. 2002, Stienlet 2000) , the Spanish *Consejo de Politica Fiscal y Financiera Financial* (Quintana & Torrecillas 2008) the German *Finanzplanungsrat* (Lübke 2005), the Portuguese *Program Financing Committee* and the *Unidade Técnica de Apoio Orçamental*, the British *Office for Budget Responsibility* etc.

In financing the very long-term impacts, just like the adaptation to climate change, the efficient solution for smooth, gradual accumulation is the fiscal funding (if the private insurance services can not create opportunity to shift the cost toward the private sector). Its weakness is that mostly those countries can easily establish such funds who have any way fiscal surplus typically from natural resource (oil) export. Such row material export based funds are e.g. the Norwegian and Russian oil funds for future pensions. Nevertheless, some member states of USA has also stability funds, or Australia has the *Future Fund* for public and military officers pension, the *Higher Education Endowment Fund* for college and university infrastructure development etc. (Blöndal et al. 2008)

The funding specified for climate change is called financing by green funding. In national level, it would be possible to select a certain type of fiscal revenue (just like the oil exporting countries do with oil trade revenues), and indicate it as a source of a fund. In high developed countries, year by year, there are specified items in the annual budget for subsidizing the modernization of carbon emission related technologies. But such spending frames are result of discretionary annual decisions made by the current government. This does not ensure the long-term financing of mitigation and adaptation. An automatic fund could not only ensure the current scale of subsidy, but also the security of long-term financing by accumulating the revenues.[5] Unfortunately, as it was already mentioned, the public budget has other long-term challenges related to demography, demanding funding for the future.

Especially in the developing countries, the national accumulation of green fund has no source. Besides, eventually the climate change is a global problem, so national, unilateral adaptation does not seem to be the most efficient. Alternative option is the international funding, where national budgets contribute as their quota prescribes. Its advantages are cooperation of low income and high income countries, and the stronger governmental commitment to the long-term objective as giving up an international membership has more transaction cost (diplomacy damage) for a country than splitting a national fund. International green fund can be a mixture of national quotas, green tax revenue as direct income of the fund and market bonds financed by Sovereign Wealth Funds and other private investors. (See Fig.6.)

Such operating fund is the Caribbean Catastrophe Risk Insurance Facility (CCRIF) in the CARICOM, described by IMF (2008:31). CCRIF is multi-country risk pool and also insurance instrument backed by both public finances and capital markets. It was set to help CARICOM countries mitigate the short-term

[1] Limitation on general government balance or primary balance.

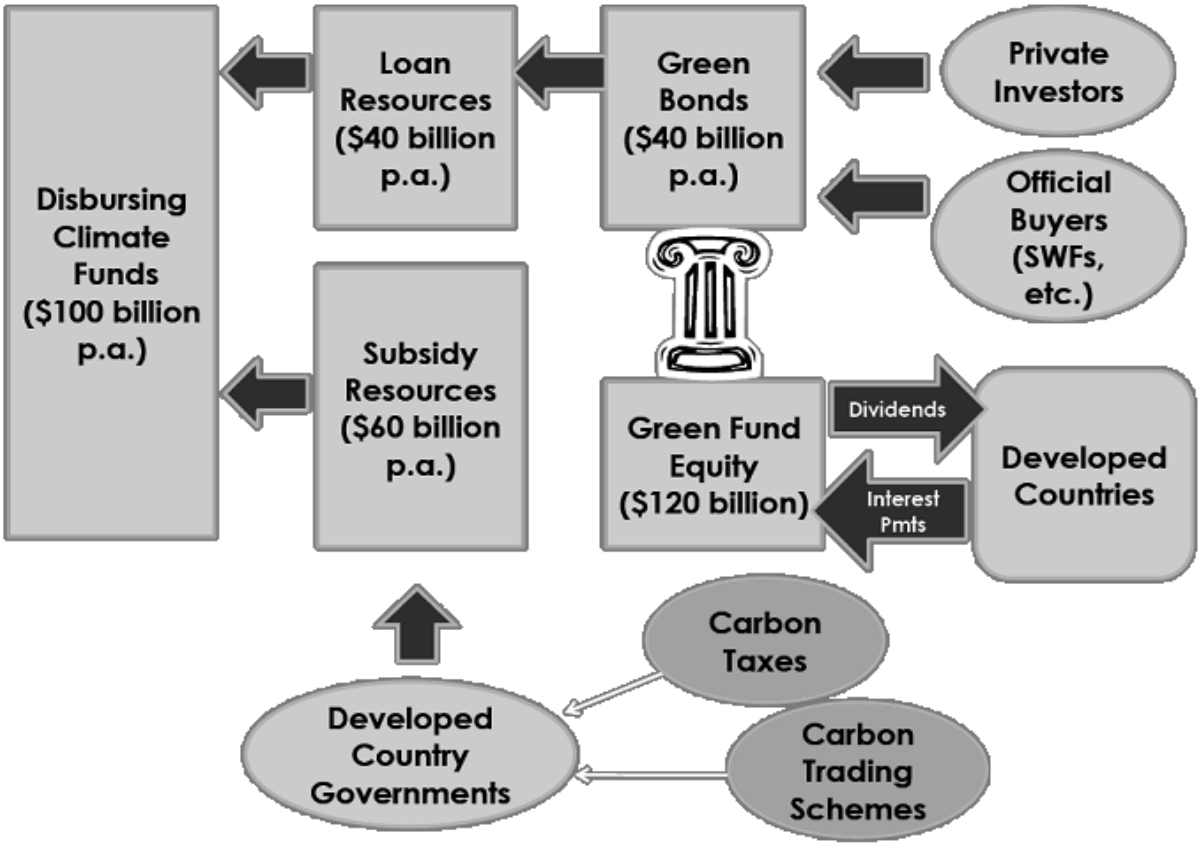
[2] Limitation on public debt level.

[3] Debt financing is allowed only in case of public capital investment, infrastructure investment.

[4] Limitation on overall spending scale.

[5] Of course, ultimately the law-makers can reintegrate any fund back to the annual budget, if that is the will of the significant political majority. So national level green funding is neither the absolute solution for financing the long-term objectives.

cash flow problems in disaster situations. It is a regional catastrophe fund for Caribbean governments, CCRIF operates as a public-private partnership, and is set up as a non-profit 'mutual' insurance entity. The CCRIF pays out in the event of parametric trigger points being exceeded. It provides rapid payment if disaster strikes. The CCRIF has coverage for hurricane, earthquake and excess rainfall. The facility is a fund operating particularly like insurance. There is plan to involve the agricultural sector and the energy companies.[1]




**Source:** Bredenkamp & Pattillo (2010:10)

**Figure 6.** Financing by green funding

Similar international green fund is in the period of formation. According to the Copenhagen Accord issued at the 2009 United Nations Climate Change Conference in Copenhagen, international Green Fund shall be ready in 2020 to ensure financial aid for developing countries. The design of the exact financing is illustrated by Figure 6. (Bredenkamp & Pattillo 2010) It seems, it is possible to capitalize a climate change adaptation from the private sector. The international Green Fund will stand on private and public pillars. The public pillar is composed from national contribution quotas, national carbon tax incomes and national revenue from CO2 quota trade. The private pillar means issuing market bonds for private investors.

However, any public funding raises the dilemma of crowding-out mentioned above, as the CCRIF and Green Fund backed by states pumps the financial resources from private investments. Moreover, as a general international aiding problem, appearing also in critics on ODA (Official Development Aid) operation, that international organizations (funds) are not able to achieve critical mass of capital to swing off the developing countries from the problem of undercapitalized position blocking the efficient risk management. The credibility of such funds will be decided on its operation, the effective commitment of the members and the realized results.

To share the financing between public and private actors, namely planned and autonomous adaptation, beside the funding, there is an other item have been already mentioned in this paper, the insurance. However, simply private insurance is not enough to have efficient mitigation or adaptation. Phaup & Kirschner

[1] For more see www.ccrif.org

(2010) assume that public risk management is more efficient than individual, especially if it is preventive. On the other hand, it can become very expansive for the state, if private sector individuals see that they can get every protection from the state. The only state financed actions are called *ex post* budgeting, as it does not motivate the individuals to be preventive. That is why the optimum is the *ex ante* budgeting which accumulate reserves for the cost of catastrophe in the future, both from tax revenue and private income. The following options can be combined in the insurance sector for *ex ante* budgeting:

(1) The state makes market transactions by purchasing insurance service from insurance companies. Its advantage is that government can secure insurance for anything considered to be necessary. The disadvantage is that the insurance sector may will not be able to pay the compensation for all the damages.

(2) The state prescribes mandated purchase of insurance for the private asset owners. The advantage will be that the market will evaluate every object to be or not to be worthy for insurance. The disadvantage is that the private risk premium is very likely higher than the public risk premium.

(3) The government-provided insurance means that the state establish a state insurance company, e.g. New Zealand Earthquake Commission. In this case, the state can control the whole process of insurance, but the possibility of political intervention is very likely, that is why the efficiency of this option is questionable.

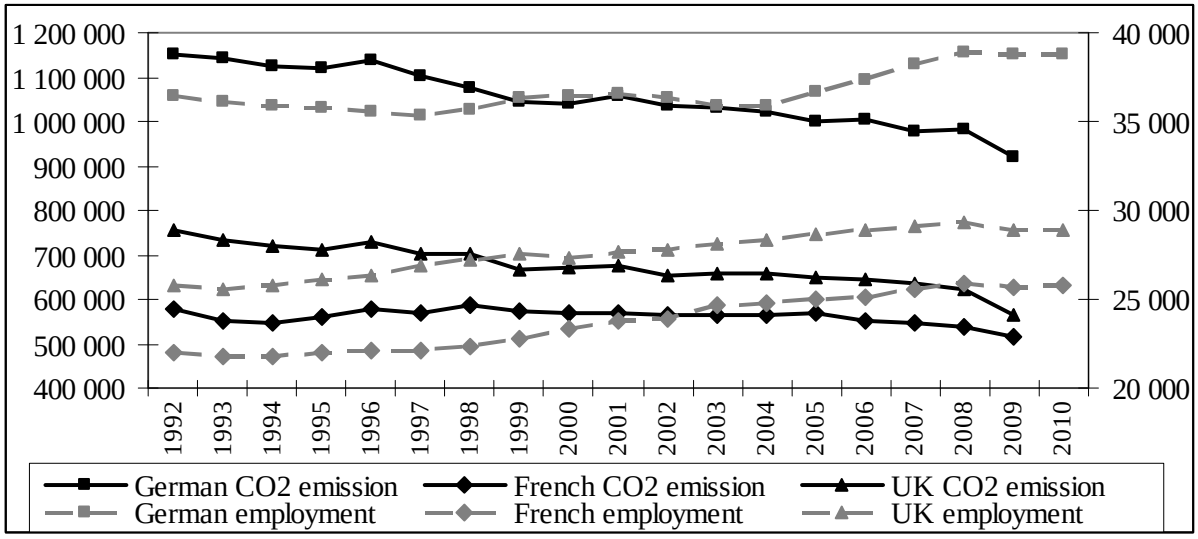
(4) Contingency Fund is the forth option, which is actually the government saving fund or green fund mentioned above.

Johns & Keen (2009) based their recommendations on situation of broadly afflicting heavy indebtedness and high deficit problems. They suppose to charge the CO2 emission with green tax to mitigate the warming and to avoid the higher deficit. Of course, introduction of a green tax has many side effects. If it hits the emission target, and CO2 pollution decreases, the tax revenue on CO2 scale will also decrease. If the green tax automatically increases the tax burden (tax wedge) on the economy, it can have the economic growth to slow down.

To manage the growth risk of crowding out and to cope with the crisis and recession of 2008, Jones & Keen (2009) proposed “green recovery”, namely state investment into green energy sector and CO2 saving technologies. Anyway, because of recovery, governments have been spending on stimulus packages. Such green stimuli could serve both the objectives of recovery and the mitigation through the multiplying impact of fiscal spending. This green recovery can be associated with employment objectives which are especially a sensitive field of economic policy, nevertheless in USA where the after crisis 2008 level of unemployment got up to 9.5-10%. Bossier & Bréchet (1995) has already recommended in the middle of 1990s that carbon tax can be connected to the cost problems of employment in Europe. As much scale of green tax burden would have been levied on the economy, so much scale of social contribution (or any other labour-related employer cost) should be eased by labour tax cut.

Even though it sounds simple, many side effects must be taken into account. How does the carbon emission tax raise the price of energy and fuels? If CO2 emission decreases, it means lower tax base, thus lower tax revenue. How to sustain the financing of social service systems if social contribution (health and pension contribution) has got decreased? Would labour tax really an incentive for more employment for companies? Is the tax cut critically enough to be effectively cheaper than foreign rivals? If companies do not see more demand, a tax cut will not motivate to hire more workers. Bossier & Bréchet (1995) warned for the risk of uncertainty and the necessity for simulation before policy actions. For example the E3ME (energy-environment-economy model of EU) by Barker (1998) was an econometric attempt to simulate effect of carbon tax on emission, GDP, competitiveness and employment.

There is a good practice on green tax reform combined with employment objectives in Germany. The *Gesetz zum Einstieg in die ökologische Steuerreform* (Act on entry into the ecological tax reform) got into power in 1999. Green tax was levied on primary energy consumption, parallel with it, the employers labour-related tax was cut. (Bach et al. 2002) Kohlhaas (2005) created *ex post* and *ex ante* model to estimate the GDP and employment effect of German green tax reform. Table 1 shows the results. The German green employment shows effective characteristics, as during the global crisis and recession the German unemployment could have decreased from 10% to 6%.




**Source:** Eurostat

**Figure 7.** Scale of emission (left axis, 1000 tons/year)
and employment (right axis, 1000 persons) in Germany, France, United Kingdom

**Table 1.** Annual change in emission, employment and GDP as impact of German ecological tax reform, %

| Change in | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2010f |
|---|---|---|---|---|---|---|---|---|
| CO2 emission | -0.55 | -1.33 | -1.75 | -1.95 | -2.39 | -2.47 | -2.61 | -3.1 |
| Employment | 0.64 | 0.76 | 0.67 | 0.41 | 0.76 | 0.63 | 0.52 | 0.46 |
| GDP | 0.39 | 0.47 | 0.44 | 0.29 | 0.45 | 0.38 | 0.3 | 0.13 |

**Source:** Kohlhaas (2005:13, Tabelle 3-1)

## 7. Conclusions

It can be established, that climate change has introduced a new aspect into the structure of public finances both in expenditure and in revenue side. The exact fiscal impact in a given country is very uncertain since neither the exact regional natural impact is unsure, nor the unilateral national/regional mitigation could be enough and efficient without global cooperation. The fiscal impacts can be mapped by calculating with direct spending related to damages caused by climate change, and with indirect impacts in revenues and new expenditure themes caused through climate impacts on the economic growth, health condition, social relations and energy demand.

It is clear, that the multi-year fiscal stimuli to anticipate the global crisis started in 2008 created unfavourable fiscal rigidity for new types of spending, like climate change related mitigation and adaptation. It is not an easy task to enforce the political decision makers to prefer a 50-100 year-long problem to their short term interest related to political cycles, either. However, there are good practices how to build-in automatisms into the budget by funding, how to keep the balanced budget by restructuring of spending and tax systems, how to involve the private (autonomous) financial resources through insurance and funding. The government must find the optimum distribution of adaptation cost between public (planned) and private (autonomous) adapting actors and the adequate structure of incentives to motivate the private individuals for cooperation and participation in mitigation and adaptation to climate change.

The efficient policy should treat with the factors or drivers of climate change cost, just like the degree of exposure to gradual and extreme climate events, the level of existing protection, the state's liability for damages, the potential and impacts of autonomous adaptation, the cross-border effects, and the fiscal capacity.

The public budget must be the reserve for mitigation with complex structure. Either infrastructural or social or health or industrial or employment etc. aspects can connect to the climate problem. It is not simple to introduce any fiscal item or action for mitigation and adaptation since fiscal crowding-out and multiplier effects must be simulated on savings, investments, carbon emission, economic growth, competi-

tiveness, external balance and employment. The simulation in the same time means testing the policy risk, namely the potential failure of green budget reform, and the political risk, namely loosing the next elections because unwanted side effects.

The ideal fiscal policy affected by climate change would be a green stimulus combining spending and green tax, meanwhile keeping the scale and balance of the budget, but restructuring the fiscal preferences, thus, cutting the wage related cost of employment and improving the international competitiveness of the national economy.

As climate change is global problem, international/global cooperation is likely to be the most efficient also in fiscal aspect. International cooperation can give solution for risk distribution, low income insolvency, credible funding with private investors, technological cooperation and access to knowledge, efficiency of early warning and reserving sustainable national budgets, all together.

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# BULGARIAN COMPETITIVENESS – PRIORITY DIRECTION FOR SUSTAINABLE DEVELOPMENT OF THE NATIONAL ECONOMY

**Maria Marikina**[1]

## 1. The priority objective of the Bulgarian Economy – high competitive power

Changes in the world economy, conditioned by political and economical factors require new approaches regarding the social-economical development, to all countries together and any one separately. Today, the attention is directed towards the competitive power concept, which concerns anyone leading economic politics at a State and Corporate level. The growing interest to this issue is explained by the tendency of countries to account for the changing standards of political-economical efficiency and the desire to achieve stability. Therefore, one of the main goals before the Bulgarian economic politics is the development of the competitive power of the National Economy. **It should be dynamically developed in order to achieve high economical growth, based on a stable social-economical progress.** This may be achieved through development of the National production, which provides the work load and the professional development of the population. The balance between the economical development and protection of environment are also considered, as well as the interrelation between the high economical growth and the high work load, and the economical participation of population are considered too.

The way towards the realization of high competitive power starts from two specific aims: stimulation of innovation and increase of efficiency of companies, and improvement of the business environment. Realization of these aims shall aid Bulgarian companies in achieving International competitive power and the same time shall proved them with key possibility to create a stable growth in the Bulgarian economy, within the framework of future economy, based on knowledge in conditions of increasing globalization.

Achievement of common goals, which follow economy politics of high competitive power, which would lead to a stable economy growth, is related to five priority directions:

**Priority direction 1: Development of economy, based on knowledge and innovations activity.**

It is directed to aiding the development of Scientific Research and Development Activity /SRDA/ for and from companies and aims stabilization of their innovation potential and establishment of a stable, suitable to the business innovation infrastructure, which would stabilize the relations between the scientific and the business environments.

**Priority direction 2: Increase of companies' efficiency and stimulation of favorable business environment.**

It is focused on the support of small and medium-sized business companies having potential for development, where modernization of technologies and quality management shall be supported, as well as consulting and information services, which are offered in the business, which would improve companies' energy efficiency and stimulate business cooperation and building of networks. Special attention shall be paid to stimulation of investments, decrease of refuse quantity, and increase of their environmental conformity, to production of energy saving technologies and use of restorable energy resources, in order to achieve a significant reduction of the energy consumption of Bulgarian companies and their unfavorable influence on ecology. Thus, the contribution to the stable development of environment shall be progressed.

**Priority direction 3: Monetary funds for developing companies.**

It aims to ease the access of companies to a capital related to development. Its goals are increase of investment activity and stimulation of entrepreneurship through development of special financial instruments and financial engineering for financing of SMALL AND MEDIUM-SIZED BUSINESS COMPANIES /SMB/. The planned interventions aim at providing new opportunities for access to the risk capital by SMALL AND MEDIUM-SIZED BUSINESS COMPANIES /SMB/ in financial niches, where the traditional bank financing currently is not accessible or not sufficient. The achievement of the greater part of these aims shall be realized through the execution of the joint initiative JEREMIE (*Joint European resources for Micro and Medium Sized Companies*).

**Priority direction 4: Stabilization of the position of the Bulgarian economy on the International market.**

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This priority direction aims to ease integration of the Bulgarian economy in the unified European and World market via improvement of the investment and export environment. It shall stimulate foreign investments in Bulgaria, shall improve the export potential of the National economy and shall support the National infrastructure of quality, increasing the quality of test and calibrating laboratories, and the bodies for evaluation of conformity.

## 2. Bulgaria's place in the global competitive power

On the 9th September 2010, the World Economic Forum (WEF) presented its final report regarding the global competitive power - The Global Competitiveness Report 2010-2011. This is the most comprehensive and thorough research regarding competitive power, and as of September 2010, it includes 139 countries. Bulgaria takes a part in this research since 1999 and thanks to it, it is possible to objectively assess the International competitive power and results of the policies, conducted in the country. Presented facts may be used as an orienteer in respect to perspectives related to Bulgaria's economical development and the place of the country among the other countries all over the world.

According to the date published by the WEF, in comparison to all other countries in the EC, Bulgaria only outdistance Greece, which due to its macro-economical instability and its problems in the social sphere goes down in the chart from the 71st to the 83rd place. (See Table1) Romania occupies the 63rd position. Estonia /33rd/ and the Czech Republic /36th/ are among the best performing newer countries of the EC. Comparing to the previous year, Hungary and Poland move significantly up and Slovenia falls down a few positions.

According to the team of the forum, the main factors (polls), which influence the competitive power, are 12. These are: institutions, infrastructure, macro-economic stability, education and qualification, effective functioning of stock markets, work force, and financial markets' development, and technological readiness, level of business development, innovation, and etc. factors are grouped in three main groups:

1. **Basic factors for development;**
2. **Factors for economy efficiency;**
3. **Innovation and maturity of business.**

These three groups of factors define also the stage of development of each country. The first group defines the first stage of development – factor dependent; the second stage includes the factors, related to the achievement of financial efficiency in economy; the third – the highest stage includes such factors as maturity of business and innovation potential.

According to the research, Bulgaria and Romania are among the EC countries, which are on the second stage of their economical progress. All other countries of he Union are more advanced in respect to the potential of higher competitive power. A great part of them have already reached the innovation depending level, and the others are in the process of transition to it (Hungary, Lithuania, Latvia, and Poland).

The most serious **contribution** for Bulgaria's better placement is related to the positioning of certain fields – **macro-economical stability, technological potential, labor market, and infrastructure.**

**Macro-economical stability**

The data of macro-economical stability in Bulgaria are good – this is the sphere where the country has god positions in the recent years – this year it advances three places up – from the 45th to the 42nd place. It is about indexes of effective management of the State's debt, inflation, State's deficit/surplus.

**Technological readiness**

This is the second factor (after the macro-economical stability), according to which Bulgaria significantly advances forward in the chart – from the 56th to the 48th place. This is the factor of the greatest contribution for the better placement during the current year. There is a great number of good technical indexes inhere – the country is on one of the upper places according to the number of cell telephones, broad band Internet access, legislation, related to the use of information and communication technologies.

Problems in this field arise from the lack of active politics related to purchase of modern technologies by the business. The role of foreign investments is too small in relation to implementation of modern technology in the Bulgarian economy. However, there is a good potential, which should be used.

**Labor market efficiency**

Bulgaria falls down 4 positions in this respect – from the 54th to the 58th place. A good evaluation was given to the flexibility of the labor market, the concessioned practices regarding hiring and releasing workers, and the relatively high level of participation of female work force. The direct ratio between re-

muneration and labor production is taken into account. There is a negative opinion related to the quality of management and the loss for the country due to "brain flow out".

**Education and qualification**

Bulgaria occupies the relatively good 58th position in respect to elementary education. The country has good indexes of the percentage of people with high-school and university education. The results of mathematics education, Internet access, etc., are favorable. Still, evaluations related to the quality of the educational system are becoming worse; professional training and the possibilities of education through the life time are assessed poorly.

**Infrastructure**

Here, Bulgaria traditionally falls behind in the chart, but the serious jump forward makes impression during the current year – from the 102nd to the 80th place. Probably the contribution here is due to the start and the fast execution of some important infrastructure sites and the perspectives for effective use of the EC funds in this respect.

**Institutions**

Regardless the fact that Bulgaria falls behind in the chart regarding institutions, it still moves two places up. The research shows that there are still serious problems, related to the inefficient legal framework for resolution of commercial disputes and the low level of independence of the judicial system. There is a progress in fighting with the organized crime and corruption. There is still a lack of transparency and sequence in the Government's policy.

**Stock markets' efficiency**

This is a field where Bulgaria falls back one place – from the 81st to the 82nd place. Evaluations related to the competitive power of the local market, clumsiness of customs procedures, low finicality of local users, are low. Data of some quantity indexes remain positive – tax size, starting a business. Contribution in this respect has the introduction of the electronic trade register from the beginning of 2008 which eased the procedures of starting a business.

**Innovations**

Bulgaria significantly falls behind in the field of innovations – it takes the 92nd place. The innovative development of the Bulgarian economy is a priority, but only in words. Measures are still not sufficient and provide no result. The country is till on one of the last places in the EC according to most of the innovation indexes. There is some improvement in the assessments related to business expenditures for research and innovations, and for the qualities of the scientific research personnel. The lack of cooperation between the business and scientific institutes in the innovation process is a serious problem; public orders play a small role for implementing of innovative solutions and products.

**Business development level**

The condition of the Bulgarian business is still negatively assessed – according to this factor Bulgaria falls back with 6 places – from the 89th to the 95th position. The economic crises, which seriously influenced entrepreneurs, plaid its negative role. They should make effort in developing winning corporate strategies, work in partnership and create clusters. Bulgarian companies are experiencing serious difficulties in the following fields: lack of adequate policy related to qualification and re-qualification of human resources, ineffective marketing and low quality management, absence of active policy related to purchase and implementation of modern technologies.

Switzerland's economy remains the occupant of the first place in the general chart this year as well**.** The USA go down with 2 places – from the 2nd to the 4th place. Germany forwards two places up due to the stable macro-economic politics and already occupies the 5th place. Sweden, Singapore, Japan, Finland, Netherlands, Denmark, etc., respect tradition and occupy the first ten places.

## 3. Perspectives for development of the economical climate in Bulgaria as a prerequisite for the increase of the competitive power

**General parameters for assessment of the business climate**

(positive influence)

- Banking system – stable
- Currency system – absence of a currency risk, low inflation
- Political environment – existing democracy
- Work force market – a possibility of choosing specialists

**General parameters for assessment of the business climate**

(negative influence)

- Banking system – high interest percentage.
- Currency system – currency Board in Bulgaria and devaluation of currencies of neighboring countries (Romania, Turkey, etc.), cost raise of the National Production in comparison to neighboring countries.
- Political environment – different points of view and contradictory actions between the Government and the Opposition.
- Efficiency of justice administering and legal defending bodies (slow reformation and not using of arbitration and mediation).
- Work force market – absence of sufficiently qualified work force.

**Specific parameters**

- Tax burden
- Administration and regulation
- Access to financing
- Transparency of public orders
- Level of the grey economy

**Perspectives of the business climate**

A good perspective comparing to other countries. The base of this point of view is the possibility to withhold these tax levels in Bulgaria, which would stimulate investors.

The second place is occupied by the fight against corruption prerequisites, which sends positive signals to investors abroad.

The third place is occupied by macro indexes and more specifically by the possibility to maintain a low budget deficit, which positively influences investors' intentions in a long-term aspect.

**Conclusion**

- Responsible competitiveness should be about accumulating wealth creation through long work-outs, building up "institutional muscle".
- Societies must efficiently manage their competitiveness in a responsible manner, finding the right balance between economic, social and environmental objectives while safeguarding the country's value system and traditional heritage.

**Table 1.** The Global Competitiveness Index 2010–2011

| Country | Economy Rank Score countries rank * |
|---|---|
| Switzerland | 1 |
| Sweden | 2 |
| Singapore | 3 |
| United States | 4 |
| Germany | 5 |
| Japan | 6 |
| Finland | 7 |
| Netherlands | 8 |
| Denmark | 9 |
| Canada | 10 |
| Hong Kong SAR | 11 |
| United Kingdom | 12 |
| Taiwan, China | 13 |
| Norway | 14 |
| France | 15 |
| Australia | 16 |
| Qatar | 17 |
| Austria | 18 |
| Belgium | 19 |
| Luxembourg | 20 |
| Saudi Arabia | 21 |
| Korea, Rep. | 22 |

| Country/Economy | Rank Score countries rank * |
|---|---|
| New Zealand | 23 |
| Israel | 24 |
| United Arab Emirates | 25 |
| Malaysia | 26 |
| China | 27 |
| Brunei | 28 |
| Ireland | 29 |
| Chile | 30 |
| Spain | 42 |
| Italy | 48 |
| Brazil | 58 |
| **Bulgaria** | **74** |
| Croatia | 77 |
| Greece | 83 |
| Georgia | 93 |
| Kenya | 106 |
| Paraguay | 120 |
| Mozambique | 131 |
| Angola | 138 |
| Chad | 139 |

The Global Competitiveness Report 2010-2011 © 2010 World Economic Forum

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# EVALUATING THE MULTIDIMENSIONALITY OF COMPOSITE INDICATORS OF DEVELOPMENT – SOME RECENT INDEX PROPOSALS

**Sandrina Berthault Moreira***
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**Abstract**

*Development is a complex and multidimensional phenomenon. The quantification of such a phenomenon requires indicators that may capture its most relevant components. In this paper, we present an extensive list of composite indicators of development and assess whether these indicators reflect the multidimensionality underlying the phenomenon they seek to measure. One of the major findings from this analysis is the limited number of development dimensions incorporated in the majority of the indices and, thus, the partial vision of the phenomenon they provide as a result. Moreover, the dimensions most commonly considered in this context are education and health. Finally, we discuss in more detail five recent indices characterized by its comprehensiveness: (i) Regional Quality of Development Index (QUARS) of Sbilanciamoci (2006); (ii) Wellbeing Index (WI) and Wellbeing/Stress Index (WSI) of Prescott-Allen (2001); (iii) Gross National Happiness (GNH) of the Centre for Bhutanese Studies; (iv) Bertelsmann Transformation Index (BTI) of Bertelsmann Stiftung (2008); (v) World competitiveness scoreboard of IMD (2008).*

**Key Words**: development; composite indicators; measurement; multidimensionality.

## 1. Introduction

One of the most important messages emerging from the literature on development economics in recent years is about the complexity and multidimensionality of the concept of development. This makes it especially difficult for income per capita – the reference indicator for ranking countries at different levels of development – to provide, by itself, a sufficient indication of the disparities that exist between countries and over time. In this context, and mainly since the 1990s, the emergence of a wide range of composite indicators of development comes as no surprise (Booysen, 2002; Saisana, 2008). The Human Development Index (HDI) is the most internationally known initiative attempting to overcome the narrow focus on income per capita.

The present paper seeks to present a broad set of composite indicators of development, highlighting the dimensions covered in each of the indices listed here. On the other hand, a much more limited group of indices is assembled for detailed discussion.

The paper is structured as follows. Section 2 proposes a disaggregation of the main dimensions of development, and presents an extensive list of indices as well as their coverage of the different dimensions of development identified here. Section 3 presents in detail five recent proposals whose multidimensional nature stands out. Section 4 presents some final remarks.

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The financial support received from Fundação para a Ciência e a Tecnologia – UNIDE; PROTEC is gratefully acknowledged. The usual disclaimer applies. An earlier version of this paper was presented at the Third International Scientific Conference "Sustainable Development", University of National and World Economy, Ravda, Bulgária, 10-11 de Junho de 2011. We would like to thank panel participants for comments.

## 2. The multidimensionality of the measurement of development – composite indicators

### 2.1. Development nomenclature

Development is now consensually recognized as a phenomenon eminently multidimensional. As a result, the adequate measurement of the phenomenon requires a quantitative assessment of its main constituent elements. The understanding of the phenomenon may vary in time, among countries or even among individuals. However, a range of dimensions transcending the material standard of living of individuals usually underlies the concept of development and its meaning, such as freedom, equity, health, education, and a healthy environment, among others.

The disaggregation of development into its main dimensions has been followed by many authors. In a survey of composite indicators of development, Booysen (2002) illustrates the multidimensionality of the indices, classifying them according to twelve different dimensions of development: (i) demographic dynamics; (ii) education, training, and knowledge; (iii) health, food, and nutrition; (iv) human settlement, infrastructure, and communication; (v) political and social stability; (vi) culture, social fabric, and family values; (vii) environmental resources and pressures; (viii) political and civil institutions; (ix) income and economic growth; (x) unemployment and labor utilization; (xi) poverty and inequality; (xii) economic freedom.

On the other hand, Boidin (2004) asserts that international indicators of well-being and development should integrate the different dimensions seen as consensual, namely, the economic dimension, the human dimension (in a broad sense), the environmental dimension, and the inequalities and poverty.

The development nomenclature proposed here encompasses structural dimensions that most directly affect a country's aggregate level of development. That nomenclature includes the following crucial dimensions: (i) income; (ii) income distribution; (iii) education; (iv) health; (v) employment; (vi) infrastructure; (vii) values; (viii) environment. The choice of those dimensions is driven by criteria of intrinsic importance of each dimension and their recurrent inclusion in alternative attempts of development disaggregation. In Table 1, the dimensions mentioned above are disaggregated into their most important subdimensions.

**Table 1.** Development nomenclature

| Income | Income distribution | Education | Health |
|---|---|---|---|
| | Poverty | Knowledge | Longevity |
| | Inequality | Educational infrastructures | Health infrastructures |
| | | Others | Others |
| Employment | Infrastructures | Values | Environment |
| Volume | Energy | Economic freedom | Atmosphere |
| Quality | Transport | Socio-political freedom | Land |
| | Communication | | Water |
| | Housing | | Nature and biodiversity |
| | Money and finance | | Others |
| | Justice | | |
| | Culture, sport, and recreation | | |
| | Others | | |

### 2.2. Composite indicators of development

Composite indicators are mathematical combinations (or aggregations) of a set of indicators. Even though there are many conceptual and methodological arguments against the use of such indicators, there are also important elements in favor of composite indicators, among which are mainly the following: (i) composite indicators synthesize complex or multidimensional issues; (ii) they are easier to interpret than a battery of separate indicators; (iii) they facilitate the task of comparing the performance across countries and their progress over time and thereby attract public interest; (iv) they reduce the size of a list of indicators without losing basic information (Booysen, 2002; Saisana and Tarantola, 2002).

Composite indicators constitute the most immediate approach in the quantification of a country's level of development. A number of index proposals are currently available in the development literature and connected domains.[1]

The following procedure was adopted in order to undertake the evaluation that motivates this paper: (i) identification of ten surveys or other recent studies including lists of composite indicators of development; (ii) establishment of a selection criterion for the indicators mentioned in those studies; (iii) analysis of the selected indicators and corresponding classification according to the development nomenclature proposed in Section 2.1.

Regarding the inclusion criterion mentioned in (ii), the development indices presented here not only include at least two of the different dimensions proposed in the development nomenclature, but are also mentioned in at least two of the selected studies.

The end result is a selection of 54 multidimensional indices associated with the concept of development and other closely related concepts that can, thus, be interpreted as measures of development. Table 2 presents, in chronological order, these composite indicators of development.

**Table 2.** Composite indicators of development

| Author/Organization(*) | Composite Indicators of Development(**) | Surveys and other similar studies including lists of indices and indicators | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Singh *et al*. (2009) | Afsa *et al*. (2008) | Bandura (2008) | Eurostat (2008) | Saisana (2008) | Soares and Quintella (2008) | Gadrey and Jany-Catrice (2007) | Goossens *et al*. (2007) | Morse (2004) | Booysen (2002) |
| Bennett (1951) | Index of relative consumption levels | | | | | | X | | | | X |
| Beckerman and Bacon (1966) | Index of relative real consumption per head | | | | | | X | | | | X |
| McGranahan *et al*. (1972) | General index of development | | | | X | | X | | | | X |
| Nordhaus and Tobin (1972) | Measure of Economic Welfare (MEW) | X | X | | | | | X | X | X | |
| Morris (1979) | Physical Quality of Life Index (PQLI) | X | | | X | | X | | | | X |
| Zolotas (1981) | Economic Aspects of Welfare (EAW) | X | X | | | | | X | | X | |
| Ram (1982) | Indices of 'overall' development | X | | | | | X | | | | X |
| Commission of the European Communities (1984) | Relative intensity of regional problems in the community | X | | | | X | | | | | |
| Ginsburg *et al*. (1986) | World standard distance scales | | | | | | X | | | | X |
| Camp and Speidel (1987) | International human suffering index | | | | X | X | X | | | | X |
| Slottje (1991) | Aggregate indexes of quality of life | | | | | | X | | | | X |
| Diener (1995) | Quality of life indices | | X | | X | | X | X | | | X |
| Estes (1998) | Weighted Index of Social Progress (WISP) | X | | X | | X | X | X | | | X |
| Goedkoop and Spriensma (2001) | Eco-indicator 99 | X | | | | X | | | | | |
| Prescott-Allen (2001) | Wellbeing Index (WI) e Wellbeing/Stress Index (WSI) | X | | X | X | X | | | | | |
| Randolph (2001) | G-Index | | | X | | X | | | | | |
| UNDP (2001) | Technology Achievement Index (TA1) | X | | X | | X | | X | | | |
| Tarantola *et al*. (2002) | Internal Market Index World (IMI) | X | | X | | X | | | | | |
| Smith (2003) | Index of Economic Well-Being (IEWB) | | X | | X | | | X | | | |
| Tsoukalas and Mackenzie (2003) | Personal Security Index (PSI) | | X | | | | | X | | | |
| UN *et al*. (2003) | Green GDP ou Environmentally adjusted NDP (eaNDP) | X | | | | | | X | X | X | |
| Hagén (2004) | Welfare index | | | X | X | X | | | | | |
| NISTEP (2004) | General Indicator of Science and Technology (GIST) | X | | | | X | | | | | |
| Porter and Stern (2004) | National innovative capacity index | X | | X | | X | | | | | |
| The Economist (2004) | Quality-of-life index | | | X | X | | | X | X | | |
| European Commission (2005) | Investment in the knowledge-based economy | X | | X | | X | | | | | |
| European Commission (2005) | Performance in the knowledge-based economy | X | | X | | X | | | | | |
| Marks *et al*. (2006) | Happy Planet Index (HPI) | | X | X | X | | | | X | | |
| Sbilanciamoci (2006) | Regional Quality of Development Index (QUARS) | | | | X | | | | X | | |
| World Bank (2006) | Adjusted net saving ou Genuine saving | X | X | X | X | | | X | X | | |
| ATK/FP (2007) | A.T. Kearney/FOREIGN POLICY Globalization Index | | | X | | X | | | | | |
| Gwartney and Lawson (2007) | Economic Freedom of the World (EFW) index | | | X | | X | X | | | | X |
| Miringoff and Opdycke (2007) | Index of social health | | X | | X | | | X | | | |
| Talberth *et al*. (2007) | Genuine Progress Indicator (GPI) | X | X | | X | X | X | X | X | X | |
| UNDP (2007) | Human Development Index (HDI) | X | X | X | X | X | X | X | X | X | X |
| UNDP (2007) | Human Poverty Index (HPI-1) for developing countries | | | X | X | | X | X | | X | X |
| UNDP (2007) | Human Poverty Index (HPI-2) for selected OECD countries | | | X | X | | X | X | | X | X |
| Bertelsmann Stiftung (2008) | Bertelsmann Transformation Index (BTI) | | | X | | X | | | | | |
| Dreher *et al*. (2008) | KOF index of globalization | | | X | | X | | | | | |
| EIU (2008) | E-readiness rankings | | | X | | X | | | | | |
| Esty *et al*. (2008) | Environmental Performance Index (EPI) | X | X | X | | X | X | | X | X | |
| Holmes *et al*. (2008) | Index of economic freedom | | | X | | X | X | | | | X |
| IMD (2008) | World competitiveness scoreboard | | | X | | X | | | | | |
| Porter and Schwab (2008) | Global Competitiveness Index (GCI) | | | X | | X | X | | | | X |
| Roodman (2008) | Commitment to Development Index (CDI) | | | X | | X | | | | | |
| StC (2008) | Mothers' index | | | X | | X | | | | | |
| van de Kerk and Manuel (2008) | Sustainable Society Index (SSI) | X | | X | X | | | | | | |
| Dutta and Mia (2009) | Networked Readiness Index (NRI) | | | X | | X | | | | | |
| EIU (2009) | Business environment rankings | | | X | | X | | | | | |
| UNU-MERIT (2009) | Summary Innovation Index (SII) | X | | X | | X | | | | | |
| Centre for Bhutanese Studies - website | Gross National Happiness (GNH) index | | | | X | | | | X | | |
| Friends of the Earth - website | Index of Sustainable Economic Welfare (ISEW) | X | X | | X | X | | X | X | X | |
| Réseau d'Alerte sur les Inégalités (RAI) - website | Baromètre des Inégalités et de la Pauvreté (BIP40) | | X | | | | | X | | | |
| Social Indicators Department [s.d.] | Index of individual living conditions | | | | X | X | | | | | |

(*) In the case of revised indices, the last revision available was used. In the case of indices periodically published, the last version available (at table construction date) was used. For some indices, the only information available is on the website, namely, the following: (i) GNH index - http://www.grossnationalhappiness.com//; (ii) ISEW - http://www.foe.co.uk/community/tools/isew/; (iii) BIP40 - http://www.bip40.org/.

(**) The list encompasses indices that capture, at least, two dimensions of the development nomenclature (one of them might be the dimension "others") - and are, thus, multidimensional indices of development - and, in addition, are mentioned in, at least, two of the selected studies.

## 2.3. The multidimensionality of the development indices

Taking into consideration the 54 composite indicators of development identified in Table 2, the final task in the present analysis consists of classifying them according to the development nomenclature. Table

[1] Indices of development might be uni- or multidimensional in nature. The first type captures only a specific dimension of development (usually, sub-dimensions of it) as opposed to the second type of indices.

3 shows the result of this process, presenting the dimensions of development included in each indicator and, thus, allowing the evaluation of the multidimensional nature of the indices.

**Table 3.** Multidimensionality of composite indicators of development

| Author/Organization | Composite Indicators of Development | Number of Dimensions | Dimensions of Development | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Income | Income Distribution | Education | Health | Employment | Infrastructure | Values | Environment | Others[(*)] |
| Bennett (1951) | Index of relative consumption levels | 4 | | | X | X | | X | | | X |
| Beckerman and Bacon (1966) | Index of relative real consumption per head | 3 | | | | X | | X | | | X |
| McGranahan *et al*. (1972) | General index of development | 5 | | | X | X | X | X | | | X |
| Nordhaus and Tobin (1972) | Measure of Economic Welfare (MEW) | 5 | | | X | X | X | X | | | X |
| Morris (1979) | Physical Quality of Life Index (PQLI) | 2 | | | X | X | | | | | |
| Zolotas (1981) | Economic Aspects of Welfare (EAW) | 6 | | | X | X | X | X | | X | X |
| Ram (1982) | Indices of 'overall' development | 3 | X | | X | X | | | | | |
| Commission of the European Communities (1984) | Relative intensity of regional problems in the community | 2 | X | | | | X | | | | |
| Ginsburg *et al*. (1986) | World standard distance scales | 3 | X | | | X | | X | | | |
| Camp and Speidel (1987) | International human suffering index | 5 | X | | X | X | | | X | | X |
| Slottje (1991) | Aggregate indexes of quality of life | 5 | X | | X | X | | X | X | | |
| Diener (1995) | Quality of life indices | 6 | X | X | X | X | | | X | X | |
| Estes (1998) | Weighted Index of Social Progress (WISP) | 5 | X | | X | X | | | X | | X |
| Goedkoop and Spriensma (2001) | Eco-indicator 99 | 2 | | | | X | | | | X | |
| Prescott-Allen (2001) | Wellbeing Index (WI) e Wellbeing/Stress Index (WSI) | 9 | X | X | X | X | X | X | X | X | X |
| Randolph (2001) | G-Index | 2 | | | | | | X | | | X |
| UNDP (2001) | Technology Achievement Index (TAI) | 2 | | | X | | | X | | | |
| Tarantola *et al*. (2002) | Internal Market Index World (IMI) | 3 | | | | | | X | X | | X |
| Smith (2003) | Index of Economic Well-Being (IEWB) | 7 | X | X | X | X | X | | | X | X |
| Tsoukalas and Mackenzie (2003) | Personal Security Index (PSI) | 5 | X | X | | X | X | | X | | |
| UN *et al*. (2003) | Green GDP ou Environmentally adjusted NDP (eaNDP) | 2 | X | | | | | | | X | |
| Hagén (2004) | Welfare index | 3 | X | | | X | | | | X | |
| NISTEP (2004) | General Indicator of Science and Technology (GIST) | 2 | | | X | | | | | | X |
| Porter and Stern (2004) | National innovative capacity index | 2 | | | X | | | | X | | |
| The Economist (2004) | Quality-of-life index | 5 | X | | | X | X | | X | | X |
| European Commission (2005) | Investment in the knowledge-based economy | 2 | | | X | | | X | | | |
| European Commission (2005) | Performance in the knowledge-based economy | 3 | X | | X | | | X | | | |
| Marks *et al*. (2006) | Happy Planet Index (HPI) | 2 | | | | X | | | | X | |
| Sbilanciamoci (2006) | Regional Quality of Development Index (QUARS) | 8 | | X | X | X | X | X | X | X | X |
| World Bank (2006) | Adjusted net saving ou Genuine saving | 3 | | | X | | | | | X | X |
| ATK/FP (2007) | A.T. Kearney/FOREIGN POLICY Globalization Index | 2 | | | | | | X | | | X |
| Gwartney and Lawson (2007) | Economic Freedom of the World (EFW) index | 2 | | | | | | | X | | X |
| Miringoff and Opdycke (2007) | Index of social health | 6 | X | X | X | X | X | | X | | |
| Talberth *et al*. (2007) | Genuine Progress Indicator (GPI) | 7 | | X | X | | X | X | X | X | X |
| UNDP (2007) | Human Development Index (HDI) | 3 | X | | X | X | | | | | |
| UNDP (2007) | Human Poverty Index (HPI-1) for developing countries | 2 | | | X | X | | | | | |
| UNDP (2007) | Human Poverty Index (HPI-2) for selected OECD countries | 4 | | X | X | X | X | | | | |
| Bertelsmann Stiftung (2008) | Bertelsmann Transformation Index (BTI) | 9 | X | X | X | X | X | X | X | X | X |
| Dreher *et al*. (2008) | KOF index of globalization | 3 | | | | | | X | X | | X |
| EIU (2008) | E-readiness rankings | 6 | X | | X | | X | X | X | | X |
| Esty *et al*. (2008) | Environmental Performance Index (EPI) | 2 | | | | X | | | | X | |
| Holmes *et al*. (2008) | Index of economic freedom | 2 | | | | | | | X | | X |
| IMD (2008) | World competitiveness scoreboard | 9 | X | X | X | X | X | X | X | X | X |
| Porter and Schwab (2008) | Global Competitiveness Index (GCI) | 6 | X | | X | X | | X | X | | X |
| Roodman (2008) | Commitment to Development Index (CDI) | 3 | | | | | | | X | X | X |
| StC (2008) | Mothers' index | 3 | | | X | X | | | | | X |
| van de Kerk and Manuel (2008) | Sustainable Society Index (SSI) | 7 | | X | X | X | X | | X | X | X |
| Dutta and Mia (2009) | Networked Readiness Index (NRI) | 4 | | | X | | | X | X | | X |
| EIU (2009) | Business environment rankings | 7 | X | | X | X | X | X | X | | X |
| UNU-MERIT (2009) | Summary Innovation Index (SII) | 4 | | | X | | X | X | | | X |
| Centre for Bhutanese Studies - website | Gross National Happiness (GNH) index | 9 | X | X | X | X | X | X | X | X | X |
| Friends of the Earth - website | Index of Sustainable Economic Welfare (ISEW) | 7 | | X | X | X | X | X | | X | X |
| Réseau d'Alerte sur les Inégalités (RAI) - website | Baromètre des Inégalités et de la Pauvreté (BIP40) | 7 | X | X | X | X | X | | X | | X |
| Social Indicators Department [n.a.] | Index of individual living conditions | 7 | X | | X | X | X | X | X | X | |
| | Total (number of indices per dimension) | | 24 | 14 | 37 | 35 | 22 | 27 | 26 | 19 | 33 |

[#] "Others" is a residual dimension, including aspects of development not reflected in the previous dimensions such as gender equality, cultural diversity, macroeconomic context, and political and social stability.

A closer inspection of Table 3 reveals some important insight into the multidimensionality of composite indicators of development. First, many multidimensional indices of development are not as wide in terms of dimension coverage and, therefore, they provide a partial vision of the phenomenon. Indeed, almost half of the indices presented in Table 3 (26 out of 54) include only two (15 indices) or three (11 indices) of the different dimensions of development identified here. Only four indices (Wellbeing Index and Wellbeing/Stress Index, Bertelsmann Transformation Index, World Competitiveness Scoreboard, and Gross National Happiness Index) encompass the nine dimensions, while another (Regional Quality of Development Index) includes eight of them.

Second, apart from the residual dimension "others", education (present in 37 out of 54) and health (included in 35 indices) are among the dimensions more frequently considered in the available indicators. This finding highlights the social dimension of development, and both aspects of development, in addition to income, are reflected in the most popular indicator for measuring development in a composite nature – the Human Development Index (HDI).

Third, the income dimension, surprisingly, is represented in only 24 indices. One possible reason is that a number of composite indicators of development appear as a reaction to the reductive perspective, centered on the use of income per capita. However, insufficiency rather than irrelevance is the main criticism inherent in the assessment of development through income per capita. The finding of a large number of indicators excluding that dimension comes as a surprise.

Fourth, the infrequent inclusion of the dimension related to income distribution should also be pointed out (14 indices), given the undeniable importance of phenomena like unequal income distribution and poverty for the analysis of a country's development.

Fifth, the same applies to the environment dimension (present in 19 indices). This finding is surprising, because the importance of environment has been emphasized in the process of development, namely in the context of sustainable development. On the other hand, it may be due to the large number of one-dimensional indicators centered on this specific dimension of development, such as the ecological footprint (Wackernagel and Rees, 1996; Ewing *et al*., 2009) and the living planet index (Hails *et al*., 2008).

Sixth and last, even though many of the composite indicators of development presented here fall short of the desirable outcome in terms of multidimensionality, a few incorporate that characteristic. They thus constitute complementary measures to the indicators most frequently used in the assessment of development – the income per capita and the HDI. The next section discusses their main characteristics and quantification approach.

## 3. Some recent proposals of composite indicators of development

### 3.1. Regional Quality of Development Index (QUARS)

The QUARS is an initiative of a campaign entitled Sbilanciamoci!. This Italian campaign involves more than 40 associations and civil society networks sharing the purpose of suggesting alternatives to the Italian budgetary policies, highlighting environmental and social aspects. The Sbilanciamoci! campaign published its first report on the quality of regional development (Qualità Regionale dello Sviluppo – QUARS) in the year 2000. Sbilanciamoci!'s understanding of that concept is as follows: "a region in which the economic dimension (production, distribution, consumption) is sustainable and compatible with environmental and social factors, where the social and health services adequately meet the needs of all the citizens, where participation in cultural life is alive, where the conditions needed to guarantee economic, social and political rights and equal opportunities to all individuals regardless of income, sex or country of origin are present and where the environment and territory are protected" (Sbilanciamoci, 2006, p. 20).

Sbilanciamoci! (2006) proposes a synthetic index – the QUARS – to evaluate the development quality of the Italian regions, encompassing seven macro-indicators and 45 variables. Concerning the environmental dimension, 10 variables are identified to assess the environmental impact of production, distribution, and consumption, as well as proper steps taken to mitigate the negative effects on the environment. The macro-indicator on the economy and labor contains four variables that reflect the working conditions and income guaranteed by the economic system and redistribution policies. In the macro-indicator of rights and citizenship, Sbilanciamoci! analyzes the social inclusion of young people, the elderly, immigrants, and other underprivileged people. In the field of equal opportunities, gender equality in economic, political, and social life is at focus. At the cultural and educational level, the following aspects are taken into account: participation in the school system; quality of the service; educational level of the population; cultural demand and supply. The health macro-indicator encompasses such features as the quality and efficiency of the service, proximity, and general health of the population. Lastly, five indicators measure political and social participation of citizens.

The variables that make up the index are all standardized, and therefore differences in score represent the actual differences existing between regions in the various aspects considered in the index.[1] Positive (negative) values for the QUARS of each region represent a score above (below) the mean for the regions. The further away the values are from zero, the further away they are from the mean value.

After the normalization of the variables, the mean values of the macro-indicators are calculated and the QUARS corresponds to the simple average of these mean values:

$$QUARS = \frac{1}{7}\sum macro - indicators \tag{2}$$

The QUARS is computed to measure development quality and thus it questions, in the first place, GDP per capita as the conventional measure of the development level, and also alternative indicators to GDP such as the HDI or the Genuine Progress Indicator (GPI). According to Sbilanciamoci!, the measurement of the development quality goes beyond the simple consideration of the income level (measured by GDP/GNP per capita) or even other purely quantitative indicators. There is a considerable weight for variables that represent qualitative aspects of a given dimension in certain dimensions of the index proposed. A distinguishing characteristic of the QUARS is thus its evaluation of the quality of the work, the quality of the social services (education, heath, and assistance), and the quality of the environment, among others.

[1] Standardization (or z-scores) means a replacement of the observed values of each indicator by the normalized values using the formula:

$$z = \left(observed\ score - average\right)/s\tan dard\ deviation \tag{1}$$

On the other hand, regarding the database, the QUARS is specifically conceived to be adopted in the economic planning of regional governments in Italy. Indeed, it is already a reference indicator in Lazio (the region of Rome). Goossens *et al*. (2007) also stress the limited availability of unconventional data such as political participation or a fair economy.

In relation to the indices methodology, Sbilanciamoci! (2006) emphasizes that the normalization method chosen (z-scores) does not allow determining the performance of a given region in absolute terms, but only in relation to the other regions taken into consideration. Subsequently, it is also not possible to have QUARS time series for a given region and follow over time only the rank position of that region. Moreover, Goossens *et al*. (2007) consider the lack of an explicit weighting method for the variables in the index to have been, in a certain way, arbitrary.

### 3.2. Wellbeing Index (WI) and Wellbeing/Stress Index (WSI)

Prescott-Allen (2001) proposes a new method to assess the sustainability of nations, given that "no country knows how to be green without going into the red" (Prescott-Allen, 2001, p. 2). According to this author, countries with a high standard of living impose excessive pressure on the environment, while nations with low demands on the ecosystem are poor. This dichotomy is more easily perceptible applying the well-being assessment method described in Prescott-Allen (2001) that, ultimately, allows the evaluation of countries' performance in four indices: (i) Human Wellbeing Index (HWI); (ii) Ecosystem Wellbeing Index (EWI); (iii) Wellbeing Index (WI); (iv) Wellbeing/Stress Index (WSI).[1]

The 36 indicators of the HWI aim to give, in an aggregate way, a more realistic picture of the socio-economic conditions than the one resulting from conventional indicators like GDP or the HDI. This index is a simple average of the values of the following dimensions: (i) health and population; (ii) wealth; (iii) knowledge and culture; (iv) community; (v) equity. The equity dimension is excluded if the average is lower without it.

In the same way, the EWI synthesizes 51 indicators on the state of the environment with the purpose of being a broader measure than other global indices such as the Ecological Footprint (EF) or the Environmental Performance Index (EPI). This index is a simple average of the values of the following dimensions: (i) land; (ii) water; (iii) air; (iv) species and genes; (v) resource use. The resource use dimension is excluded if the average is lower without it.

The other two above indices are specific to the Prescott-Allen's (2001) well-being assessment method. The first – WI – juxtaposes the two previous indices so they can be compared, and the second one – WSI – measures the ecological cost of human well-being. Both measure people and the ecosystem together, in order to compare their status, verify the impact of one on the other, and stress improvements in both.

Apart from the dual focus present in the well-being assessment method of Prescott-Allen (2001) – human and ecosystem well-being – this method is distinguished from the others (at the sustainability assessment level) by the use of the so-called barometer of sustainability. This graphic instrument gathers information on the four indices mentioned above and corresponds to a visual representation of the results, allowing an easy interpretation of the sustainability of the system (Figure 1).

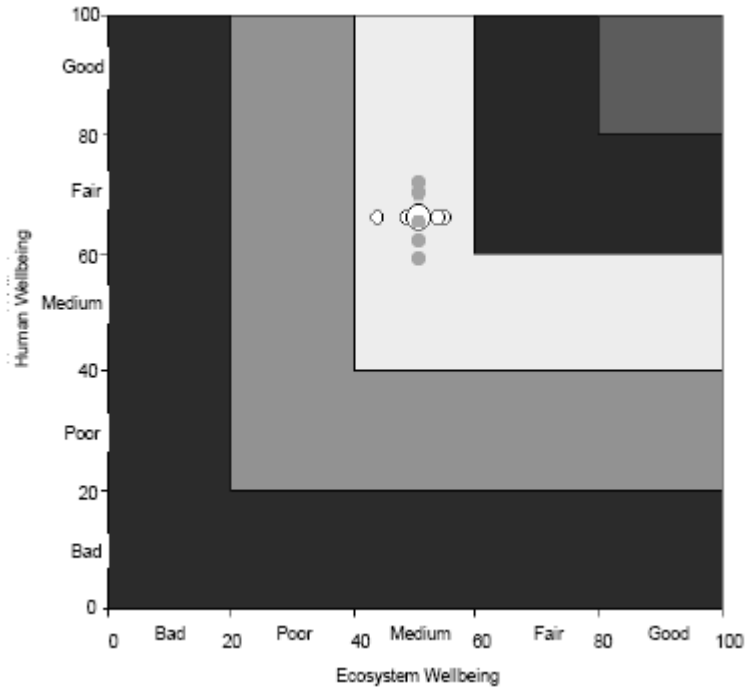
The WI is the arithmetic average of the HWI and the EWI, corresponding to the point on the barometer where both intersect:

$$WI = \frac{HWI + EWI}{2} \tag{3}$$

In turn, the WSI is given by the ratio of human well-being to ecosystem stress:

$$WSI = \frac{HWI}{100 - EWI} \tag{4}$$

[1] Prescott-Allen's (2001) well-being assessment method encompasses six stages: (i) definition of the system and its goals; (ii) identification of the elements for each of the sub-systems (human system and the ecosystem) and their respective objectives; (iii) choice of both indicators that best represent the elements of the system and performance criteria for each indicator; (iv) collection of data and normalization of the indicators; (v) calculation of the four indices (mentioned above); (vi) revision of the results and policy proposals.




**Source:** Adapted from Prescott-Allen (2001).

**Figure 1.** Barometer of sustainability

The dimensions of the indices that form both the WI and the WSI – HWI and EWI – are disaggregated in elements and/or sub-elements, represented by a single indicator whenever possible and, in some cases, by multiple indicators. Overall, there are 36 and 51 indicators, respectively.

The observed value of each indicator is transformed into a value that matches the performance scale on the barometer. The idea is as follows: (i) the barometer scale comprises five bands – bad, poor, medium, fair, and good – and the corresponding values range 20 points each on a scale of 0 to 100 (Figure 1); (ii) for each indicator minimum and maximum values of performance are previously defined to each of the above bands;[1] (iii) the observed value of a given indicator determines the minimum and maximum values (of a given band) to be used in the normalization of the indicator by employing the following formula:

$$\frac{\left(\left(observed\ value - \min value\right)/\left(\max value - \min value\right)\right)\times 20}{\min\ point\ on\ the\ scale\ barometer} \tag{5}$$

The next step is to aggregate scores in hierarchy: indicator scores into sub-element scores; sub-element scores into element scores; element scores into dimension scores; finally, dimension scores are combined into two indices – HWI and EWI. Dimensions are given equal weight, but elements, sub-elements, and indicators are sometimes given different weights.[2]

The depth and breadth of the work developed by Prescott-Allen (2001) is undeniable, even though some limitations are present. The choice of indicators that best represent the elements of the system as well as performance criteria for each indicator is a time consuming stage of the well-being assessment method. Some authors also raise the problem of data availability (Graymore, 2005) and treatment given to the equity and resource use dimensions (Eurostat, 2008).

### 3.3. Gross National Happiness (GNH) index

The GNH is a complex concept that includes a set of inter-related human happiness conditions that, until recently, had not been measured or aggregated into a GNH index. The origins of the concept can be traced back to the early 1970s and are attributable to King Singye of Bhutan, who coined the phrase

[1] Performance criteria are available in Prescott-Allen, 2001, pp. 300-6.

[2] Choices made for the different components of the indices at the weighting and aggregation level are summarized in Prescott-Allen, 2001, pp. 310-2.

"Gross National Happiness is more important than Gross Domestic Product". At the end of 2008, this Asian country officially adopted the GNH index developed by the non-governmental organization Centre for Bhutan Studies (CBS).

Measures of happiness available in the literature are subjective well-being measures such as the satisfaction with life index proposed by White (2007). In general, individuals respond to a question like "how happy are you?" on an ordinal scale, ranging from 1 (the worst result) to "n" (the best result). Indicators of subjective well-being are then defined based on the mean, the median, or the variance of the distribution. On the other hand, a number of conventional measures of progress and development are multidimensional in nature but objective measures of well-being that do not reflect the Bhutanese understandings of happiness adequately. Based on these arguments, the CBS proposes an index – the GNH index – aimed to be a deeper representation of well-being than existing indicators and, in particular, a reflection of the happiness and general well-being of the Bhutanese population.

The GNH index includes nine core dimensions of human well-being, from traditional areas of social concern such as standard of living, education, and health to less traditional ones such as time use (work vs. leisure), emotional well-being, and community vitality. The first dimension is measured by the psychological well-being index comprising emotional balance indicators, spiritual indicators, and an indicator of general psychological distress. The second dimension is assessed through an index of time use that includes two variables – sleeping hours and total working hours. The third dimension is measured by a community vitality index consisting of indicators of family vitality, safety, reciprocity, social support, trust, socialization, and kinship density. The fourth dimension is captured by an index culture that gathers indicators of value transmission, basic precepts, community festivals, dialect use, traditional sports, and artisan skills. The fifth dimension has a health index that evaluates the health status of the population, its health knowledge and the barriers to health care access. The sixth dimension is quantified through the education index, which analyze the educational level of the population, its understanding of the district language, and its knowledge of history and local traditions. The seventh dimension corresponds to ecological diversity and resilience, capturing ecological degradation and ecological knowledge of the population and its forestation practices. The standard of living index encompasses indicators linked to income, housing, food security, and hardship, and is the eighth dimension. Finally, the ninth component of happiness and well-being in Bhutan is good governance, which evaluates government performance, the degree of people's freedom and their level of institutional trust.

The indicators that comprise the sub-indices of the GNH index are estimated from survey questionnaire data; given that individuals are interested in their own well-being and are thus the ones that can best judge the subject. This inquiry was conducted in different districts of Bhutan between the end of 2007 and the beginning of 2008 and included a mixture of objective, subjective, and open-ended questions.

The methodological approach followed in the calculation of the GNH index also assumes an innovative character and can be disaggregated in two steps. In the first instance, one applies a sufficiency cut-off to each indicator of the index, assuming a meaning similar to the concept of poverty line in the poverty measurement context. The poverty line separates the poor from the non-poor and, correspondingly, this divider line of sufficiency distinguishes the individuals who attain a sufficient level of achievement in a given indicator from those whose attainments fall short of sufficiency. The establishment of sufficiency cut-offs involves value judgments, but it is possible to identify some sufficient level of achievement on the different indicators of the index, the attainment of which would reflect a sufficient quality of life. Achievements above that level would hardly contribute to an improvement of the individual's quality of life, and thus an individual is considered happy if that person achieves sufficiency in all nine dimensions of the GNH index.

The procedure to accomplish this first step consists in the attribution of the value of zero for the indicators in which the individual attains sufficiency or above sufficiency and the value of one otherwise. Subsequently, the latter values are replaced by the distances from the cut-offs applying the following formula:

$$\left(cutoff\ of\ sufficiency - observed\ achievement\right)/cutoff\ of\ sufficiency \tag{6}$$

The depth of the insufficiency levels is taken into account by dividing the shortfall from sufficiency by the sufficiency cut-off itself, that is, the further away from the cut-off, the greater the value obtained. Finally, the distances from the cut-offs are squared in order to take into account the severity of the insufficiency levels, and thus give more weight to poor achievements.

The second step to compute the GNH index is the aggregation of data (sample) population. Replicating the above procedure for all the individuals in the sample, one obtains, for each indicator, the simple average of the squared distances from the cut-offs. The difference between the value of one and a given average gives us the contribution of that indicator to the index. An equal weighting to these resulting values and their linear aggregation in the corresponding sub-index and a same procedure for the sub-indices and the final index determine the value of final index.

In brief:

$$GNH\ index = average\left(1 - squared\ dis\tan ce\ from\ cutoff\right) \tag{7}$$

The GNH index has been computed for the different districts considered in the analysis of happiness and well-being in Bhutan. The decomposition of the GNH index by dimension (or indicator) reveals immediately those dimensions that present the largest shortfalls from sufficiency. Future surveys will allow an analysis of the index and inherent dimensions over time.

### 3.4. Bertelsmann Transformation Index (BTI)

The transformation index of Bertelsmann Stiftung is a German initiative that assesses the development and transformation processes of countries that have yet to achieve a fully consolidated democracy and market economy. Here the distinctive mark is on the evaluation of developing and transformation countries from two perspectives: on the one hand, the state of democracy and market liberalization; on the other, the performance of political leaders in the management of these changes. Therefore, Bertelsmann Stiftung produces world rankings on two indices: the status index and the management index. Both are computed on the basis of 17 criteria subdivided into 49 questions in total. The scores of the third survey are available in Bertelsmann Stiftung (2008).

The status index scores represent the mean value of the democracy and market economy scores:

$$Status\ index = \frac{1}{2}\left(\frac{1}{5}\sum democracy\ criteria + \frac{1}{7}\sum market - economy\ criteria\right) \tag{8}$$

The scores of the first dimension aggregate the scores of five equally weighted criteria: (i) *stateness*; (ii) political participation; (iii) rule of law; (iv) stability of democratic institutions; (v) political and social integration. The criteria scores, in turn, are the means of quality assessments by experts that respond on an ordinal scale ranging from 1 (worst) to 10 (best).

The scores of the market economy dimension are likewise the simple average of seven criteria scores – (i) the level of socio-economic development; (ii) the organization of the market and competition; (iii) currency and price stability; (iv) private property; (v) welfare regime; (vi) economic performance; (vii) sustainability – and the scores of each criterion, in turn, correspond to the mean of the scores for the respective individual questions.

On the other hand, the management index reveals the quality of political management under given structural conditions. The index takes into account structural difficulties such as high levels of poverty or a history of violent conflicts, given that good governance under difficult conditions should be appreciated more than an equivalent performance under promising conditions. Therefore, the management index scores represent the mean value of four management criteria weighted by a fifth criterion, the level of difficulty, which captures such difficult structural conditions:

$$Management\ index = \frac{1}{4}\sum management\ criteria \times \left[1 + \left(level\ of\ difficulty - 1\right) \times \frac{0.25}{9}\right] \times \frac{10}{12.5} \tag{9}$$

In other words, the experts evaluate through specific qualitative indicators the degree of accomplishment in the criteria of steering capability, resource efficiency, consensus-building, international cooperation and the level of difficulty. The qualitative indicators of the last criterion are combined with quantitative indicators that reflect a country's level of economic development and education. The resulting mean level of difficulty scores are multiplied by the mean management criteria scores (after being converted to an appropriate scale) to compute the final index (management index).

### 3.5. World competitiveness scoreboard

The World Competitiveness Scoreboard (WCS) is an overall ranking published in the world competitiveness yearbook and developed by the Institute for Management Development (IMD), a leading Swiss management school.

Similar to the Global Competitiveness Index (GCI) of the World Economic Forum (Porter and Schwab, 2008), the IMD produces an annual ranking on global competitiveness for various economies worldwide, from the most to the least competitive. According to the IMD (2008), the competitiveness of nations is their ability to create and maintain an environment that sustains more value creation for its enterprises and more prosperity for its people.

On the basis of the global competitiveness ranking there are four competitiveness factors that, in turn, are disaggregated into five sub-factors each (subf): (i) economic performance (EP): domestic economy, international trade, international investment, employment, and prices; (ii) government efficiency (GE): public finance, fiscal policy, institutional framework, business legislation, and societal framework; (iii) business efficiency (BE): productivity, labor market, finance, management practices, and attitudes and values; (iv) infrastructure (IS): basic, technological, scientific, health and environment, and education. The criteria that form each sub-factor are a combination of hard and soft data. Hard data are quantitative data from regional and international organizations as well as privates industries in a total of 131 criteria. Soft data are compiled from IMD's Executive Opinion Survey, which gathers 123 questions conceived to measure competitiveness as it is perceived by business executives.

The starting point in designing IMD's (2008) rankings is to compute the standardized value of each of the 254 criteria/indicators for the different economies under scrutiny.[1] The economies are then ranked by criterion, sub-factor, and factor and, finally, the global competitiveness ranking is calculated. Quantitative data and survey data are both weighted such that, overall, the former accounts for two-thirds in the determination of the global ranking and the latter one-third. The remaining components of the final index (factors and sub-factors) are equally weighted:

$$WCS = \frac{1}{4}\left(\frac{1}{5}\sum subf\ EP + \frac{1}{5}\sum subf\ GE + \frac{1}{5}\sum subf\ BE + \frac{1}{5}\sum subf\ IS\right) \tag{10}$$

## 4. Final Remarks

Development is described as a complex phenomenon with a multidimensional content. Consequently, indicators that capture that multidimensional nature are needed for a quantitative evaluation of the domain. In this context, composite indicators in the assessment of development gain greater importance. These indicators share the most important advantage of summarizing an extensive volume of information on the different dimensions that characterize a given complex phenomenon.

In this study, we have focused on multidimensional indices of development. Based on a sample of 54 composite indicators of development, we have evaluated their dimension coverage. We conclude that, in general, the indices of development include only a restricted number of development dimensions. We have also found that education and health are among the dimensions most frequently present in composite indicators of development.

The five indicators discussed in this paper should be stressed, as they constitute complementary measures to the most frequently used indicators in development assessment – the income per capita and the widely-used composite indicator, the HDI. Nonetheless, the development of new indicators that, in addition to their comprehensiveness, have a more universal application – facilitating more direct comparisons at the international level – is still to come.

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# HUMAN DEVELOPMENT IN SOUTH-EASTERN EUROPEAN COUNTRIES IN THE PROCESS OF TRANSITION

**Paskal Zhelev**[1]

**Abstract**

*The paper starts by clarifying the concept of human development which was originally introduced as an alternative to the conceptions of development concentrated on economic growth. In the context of the human development paradigm, income and economic growth are a means and not an end to development, and people's wellbeing depends on how income is used to achieve higher quality of life standards.*

*The paper then describes and assesses the economic performance through changes in human development in South-Eastern European countries since 1990. The transition to a market economy proved to be an arduous task for these countries which recorded a much slower social and economic progress and respectively lower index of human development compared to Central and Eastern European Countries. In today's globalized world healthier and well educated human resources represent the essential prerequisite for a nation's competitiveness and sustainable prosperity. It is inferred that in order for economic growth to be sustained a focus on human development should be put a top priority in pursuing any national development policies and strategies.*

JEL classification: *O15, O52, P27*

Key words: *sustainable human development, economic growth, human development index, South-Eastern Europe, human capital*

## Introduction

South-Eastern Europe countries (SEE) have a strategic geographic location and are of particular importance for the European Union, which considers political stabilisation and economic prosperity of the region as a major concern. Accordingly all the SEE countries are potential future members or already full members of the EU.[2]

During the process of transition to a market economy SEE recorded a much slower economic growth and progress in transformation as compared to Central and Eastern European (CEE) countries due to a number of factors among all inconsistent macroeconomic stabilisation policies, recurrent economic crises, unfavourable initial conditions (level of development, quality of social and technical infrastructure) and devastating consequences of wars and political and ethnic conflicts in the region. Yet it has registered impressive growth rate during the last decade and to many it is to be the future growth region in Europe. However, a continuation of the good economic performance and rise in prosperity in SEE is not to be taken for granted. Adverse demographic developments and under-utilisation of human capital, as well as a persistent brain-drain and inadequate investment in education and skills, are starting to threaten the long-term sustainability of the region. Whether or not the current peace in the Western Balkans will last, or whether new conflicts emerge, will in large measure depend on the region's future economic and social development.

The aim of the paper is to evaluate the economic performance of South-Eastern European countries (SEECs) and their socio-economic progress prospects through analyzing changes in human development in the region in the transformation process.

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[2] For the purposes of this paper SEE comprises the transition countries from South-Eastern Europe: the Western Balkans (Albania, Bosnia & Herzegovina, Croatia, FYR of Macedonia, Montenegro, Serbia) and the EU new member states (NMS-2) – Bulgaria and Romania. Slovenia, largely perceived to be part of CEE is often used as a comparator country.

## 1. The concept of human development

In 1990 the first Global Human Development Report stated that "The basic objective of development is to create an enabling environment for people to enjoy long, healthy and creative lives. People are the real wealth of nations." [11, 1990, p.9]. It gave the birth to a new concept of development – the human development (HD), defined as "a process of enlarging people's choices. The most critical ones are to lead a long and healthy life, to be educated and to enjoy a decent standard of living." [11, 1990, p.10].

Many of the HD concept key principles, however, can be found in the writings of scholars and philosophers from past eras and across many societies. The idea that human wellbeing is the purpose, the end, of development dates back at least to Aristotle in ancient Greece who argued that "wealth is evidently not the good we are seeking, for it is merely useful and for the sake of something else". Lagrange, Smith, Ricardo, Marx and Mill articulated similar and related positions. Renewed attention to their work arose in part as a result of growing criticism to the leading development approach of the 1980s, which presumed a close link between national economic growth and the expansion of individual human choices. Many, such as Dr. Mahbub ul Haq, the Pakistani economist who played a key role in formulating the human development paradigm, came to recognize the need for an alternative development model due to many factors, including:

- Growing evidence that did not support the then prevailing belief in the "trickle down" power of market forces to spread economic benefits and end poverty;
- The human costs of Structural Adjustment Programmes became more apparent;
- Social ills (crime, weakening of social fabric, HIV/AIDS, pollution, etc.) were still spreading even in cases of strong and consistent economic growth;
- A wave of democratization in the early 90's raised hopes for people-centred models. [15, 2011]

According to Mahbub ul Haq the defining difference between the economic growth and the human development schools is that the first focuses exclusively on the expansion of only one choice – income – while the second embraces the enlargement of all human choices – whether economic, social, cultural or political.

It could be argued that income is a good proxy for all other human choices since access to income permits exercise of every other option. The proponents of the HD concept, however, assert that there is no automatic link between income growth and human progress, for a variety of reasons.

First, income is a means, not an end, it may be used for military purposes or for improved healthcare system. Well-being of a society depends accordingly on the uses to which income is put, not on the level of income itself. Moreover, present income of a country may offer little guidance to its future growth prospects. If it has already invested in people its potential income may be much higher what its current income level shows and vice versa. The use that societies make of their wealth, not the wealth itself is decisive.

Next, income may be unevenly distributed within a society. People who have limited access to income will see their choices fairly constrained though living in a high-income country.

Therefore the link between expanding income and expanding human choices depends on the quality and distribution of economic growth, not only on the quantity of such growth. The HD concept supporters argue that a link between growth and human lives has to be created consciously through deliberate public policy – such as public spending on social services and fiscal policy to redistribute income and assets. According to them this link may not exist in the automatic workings of the marketplace, which can further marginalize the poor. Economic growth is essential in poor societies for reducing poverty, but the quality of this growth is just as important as its quantity. Purposeful public policy (which varies from country to country) is needed to translate economic growth into people's lives. Growth can be ruthless, rootless, futureless and jobless – but when the links are strong, growth and human development are mutually reinforcing.

The human development school at first drew attention primarily to the choices in three essential areas: the opportunity to lead a long and healthy life; the opportunity to acquire knowledge; and the opportunity to have access to resources needed for a decent standard of living. To this was later added several other dimensions and aspects, and the name of the concept itself was changed from *'human development'* to *'sustainable human development'* in order to highlight the importance of sustaining all forms of capital and resources - physical, human, financial, and environmental - as a precondition for meeting the needs also of future generations.[7, 1996, p.5]

It is fair to say that the HD development paradigm is the most holistic development model that exists today. It embraces every development issue, including economic growth, social investment, people's empowerment, provision of basic needs and all other aspects of people's lives.

The HD concept has the following broadly accepted features:

- Development must put people at the centre of its concerns;
- The purpose of development is to enlarge all human choices, not just income;
- The HD paradigm is concerned both with building up human capabilities (through investment in people) and with using those human capabilities fully (through an enabling framework for growth and employment);
- HD has four essential pillars: equality, sustainability, productivity and empowerment. It regards economic growth as essential but emphasizes the need to pay attention to its quality and distribution, analyses at length its link with human lives and questions its long-term sustainability;
- Unlike the one-sided concepts to human capital formation, human resource development and human welfare, the HD concept is more balanced. While emphasising the significance of HD as an end, the importance of HD as a means as well is appreciated. The HD approach takes full note of the robust role of human capital while at same time avoids viewing humans merely as a means of production and material prosperity. They are the ultimate ends and beneficiaries of the development process as well as participants in it.
- The HD paradigm defines the ends of development and analyses sensible options for achieving them. [5, 2003, p.19]

As indicated above, the concept of human development emerged as an alternative to approaches to development which focused on growth. It is therefore important to compare the HD and the neoclassical paradigm of the Washington consensus, which was imposed on transition economies by the Bretton Woods institutions and until recently used to be the dominant international economic paradigm. In fact, both HD and neo-liberalism share many common roots, most notably in the long liberal tradition in philosophy and economics, which emphasizes the fundamental importance of individual choices and the value of well-functioning markets to enable individuals to exercise these choices. But despite the similarities there are important differences at every stage which are summarized in table 1.

**Table 1.** HD and Neo-liberalism paradigms comparison

| | ***Human development*** | ***Neo- liberalism*** |
|---|---|---|
| *Objective* | Expansion of human opportunities and capabilities | Maximization of economic welfare |
| *Focus of concern* | People | Markets |
| *Guiding principle* | Equity and justice | Economic efficiency |
| *Emphasis* | Ends | Means |
| *Trend focus* | Poverty reduction | Economic growth |
| *Poverty definition* | Population in multidimensional deprivation | Population below minimum income line |
| *Key indicators* | HDI, IHDI, MPI, GII | GNP, GNP growth and percent below income poverty line |
| *Strengths* | - Focus on fundamentals<br>- Choices, opportunities and capabilities<br>- Non-market issues like time, intra-household distribution<br>- Multidisciplinary and pragmatic | - Strong economic theory and financial analysis<br>- Much economic data and up to date |
| *Weaknesses* | - Analysis often casual<br>- Often weak data | - Neglect of non-economic issues<br>- Disregard of countries' different specific conditions<br>- Dogmatic |

**Source:** adapted from Jolly, R.,(2002)

The objective of HD concept is expansion of human opportunities and capabilities. As people are the central focus of concern, they are the ends towards which all analysis and policy are directed. The guiding principle is equity. In contrast, the objective of the neo-liberal analysis is the maximization of economic

welfare. The focus of concern in analysis and policy is markets and their functioning – and thus on the means rather than the ends of development. The guiding principle is efficiency.

These differences are obvious in the indicators used to measure goals and achievements. In the HD approach, the indices are multidimensional. The first Human Development Report introduced a new way of measuring development by combining indicators of life expectancy, educational attainment and income into a composite human development index, the HDI. The breakthrough for the HDI was the creation of a single statistic which was to serve as a frame of reference for both social and economic development. The HDI sets a minimum and a maximum for each dimension, called goalposts, and then shows where each country stands in relation to these goalposts, expressed as a value between 0 and 1. The 2010 HD Report introduced the Inequality-adjusted HDI (IHDI), a measure of the level of human development of people in a society that accounts for inequality. Under perfect equality the HDI and the IHDI are equal. The Multidimensional Poverty Index (MPI), complements money-based measures by considering multiple deprivations and their overlap. The index identifies deprivations across the same three dimensions as the HDI and shows the number of people who are poor (suffering a given number of deprivations) and the number of deprivations with which poor households typically contend. The Gender Inequality Index (GII), built on the same framework of HDI, tries to better expose differences in distribution of achievements between women and men.

Under the neo-liberal approach, GNP and GNP growth form the central indicators of success, along with inflation and various indicators of economic balance, such as the balance of payments and the surplus or deficit in public expenditure. Neo-liberalism is totally silent about the ends towards which these economic indicators lead. It may address the increase in income, but it does not consider what that income actually brings to people's lives and whether they enjoy better living conditions or not. [6, 2002, p.108]

The HD paradigm is multidisciplinary and pragmatic, emphasizing ends and decentralized approaches, focusing on fundamentals. Accordingly these strengths are bought at a price – the analyses are often casual based on weak data. By contrast, the neo-liberal paradigm has strong theoretical foundations that are sufficient for a wide range of economic and financial issues, but neglects non-economic factors, which are important in terms of recognizing human values and strengthening human capabilities. It is purely economic, emphasizes means and is considered as dogmatic.

Joseph Stiglitz (1998)[1] was one of earliest and most eloquent critics of the neoclassical paradigm manifested in the "Washington consensus" – a package of policies of deregulation, privatization, trade liberalization and free-flowing capital, that multilateral organizations urged developing and transition economies to adopt. He has argued that there is a need for a "post-Washington Consensus", a new paradigm. This should seek to achieve broader objectives-embracing a focus on the living standards of people and the promotion of equitable, sustainable and democratic development. It should use a wider range of instruments to build markets as well as to correct market failure, and to foster competition as well as liberalization and privatization. It should also adopt limited forms of regulation, if necessary controlling short-term international capital flows. Finally change should not be imposed from outside but requires ownership, participation, partnership and consensus building.

In the so-called Spence report[2], commissioned by the World Bank itself, the "Washington consensus" which was the ruling development paradigm for years, instructing policymakers what to do and not to do, has been replaced by a new model of letting countries develop in their own way. Gone are confident assertions about the virtues of liberalisation, deregulation, privatisation, and free markets. Also gone are the cookie cutter policy recommendations unaffected by contextual differences. Instead, the Spence report adopts an approach that recognizes the limits of what we know, emphasizes pragmatism and gradualism, and encourages governments to be experimental. [13, 2008].

[1] Stiglitz, J., (1998), Towards a new paradigm for development: Strategies, policies, and processes. Prebisch Lecture given at UNCTAD, Geneva, October 19.

[2] World Bank (2008) The Growth Report – Strategies for Sustained Growth and Inclusive Development, Washington

## 2. Human development performance and challenges in South-Eastern European countries

**The period that followed the collapse of the socialist system was marked by a dramatic decline in the living conditions of the peoples** of SEE. Barlett (2009)[1] argues that the conflicts of the 1990s pushed the countries into the European „super-periphery" characterized by deindustrialization and high unemployment, political turmoil and instability. This meant in particular a rapid fall in production, falling household incomes and expenditure, and a decline in all forms of government service, including healthcare and education.

In the second half of the 1990s the SEE economies (except Bulgaria and Romania) turned to positive economic growth, and from the year 2000, the national product in each economy increased substantially, with growth rates being in excess of average world and EU rates. This sounds impressive, but it must be seen against the low base from which the economies took off after the large shrinkage before the 1990s. High GDP growth in period prior up to 2008 (before the Global financial and economic crisis) was not accompanied with significant labour market improvements. It could be characterized as "jobless growth" as progress has remained less than satisfactory in respect of employment and other dimensions of social development.

These nations continue to be confronted with comparatively low rates of labour force participation and employment, high aggregate unemployment and large-scale joblessness for youth, large proportions of informal employment. [10, 2006, p.40] At the same time namely employment is a key ingredient to combating poverty and promoting greater income equality, both within and across countries.

**Table 2.** Economic growth and unemployment levels in SEE

| Countries/ Years | GDP (% change in real terms) | | | | | Unemployment (as a % of labour force) | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | **1990** | **1995** | **2000** | **2005** | **2009** | **1990** | **1995** | **2000** | **2005** | **2009** |
| **Albania** | -10 | 13.3 | 6.5 | 5.7 | 3.3 | 9.5 | 10.2 | 16.8 | 14.4 | 13.7 |
| **Bosnia & Herzegovina** | -23.2 | 20.8 | 5.5 | 3.9 | -2.8 | --- | --- | 39.0 | 42.0 | 24.1 |
| **Bulgaria** | -9.1 | 2.9 | 5.4 | 6.4 | -4.9 | 1.6 | 13.7 | 16.4 | 10.0 | 6.8 |
| **Croatia** | -7.1 | 6.8 | 3.0 | 4.2 | -5.8 | 9.3 | 14.5 | 15.7 | 12.3 | 9.2 |
| **Macedonia, FYR** | -9.9 | -1.1 | 4.5 | 4.1 | -0.8 | 18.5 | 35.6 | 32.2 | 37.3 | 32.2 |
| **Montenegro** | -7.9 | 6.2 | 3.1 | 4.2 | -5.7 | --- | 32.1 | 37.3 | 25.2 | 15.1 |
| **Romania** | -5.7 | 7.1 | 0.0 | 4.1 | -7.1 | --- | --- | 7.3 | 5.9 | 7.8 |
| **Serbia** | -7.9 | 6.1 | 5.2 | 5.6 | -3.1 | 19.7 | 24.2 | 25.6 | 32.4 | 27.9 |
| **Slovenia** | -7.5 | 4.1 | 4.1 | 4.5 | -8.1 | --- | 7.2 | 6.4 | 7.2 | 6.0 |

**Source:** EBRD

**Table 3.** GDP in South-Eastern Europe

| Countries | Year in which the 1989 GDP level was reached | Real GDP in 2010 (1989 = 100) | GDP per capita in PPP, EU-27 = 100 |
|---|---|---|---|
| Albania | 2000 | 172 | 29 |
| Bosnia & Herzegovina | not yet | 84 | 28 |
| Bulgaria | 2006 | 110 | 44 |
| Croatia | 2006 | 104 | 62 |
| FYR of Macedonia | 2008 | 102 | 34 |
| Montenegro | not yet | 86 | 43 |
| Romania | 2005 | 117 | 46 |
| Serbia | not yet | 70 | 43 |
| Slovenia | 1998 | 146 | 88 |

**Source:** EBRD; WIIW

[1] Bartlett, W. (2009). "Economic development in the European super-periphery: evidence form the Western Balkans", *Economic Annals*, Volume LIV, No.181.

Transition, which was once envisaged as an orderly process of institutional change from a centrally directed to a market economy, has proven to be an arduous task for the SEE region. Despite the high growth rates in the last years, three of the SEE countries haven't even reached their pre-transition level of GDP yet, for the rest it took between 11 and 19 years to achieve it.

Unlike Slovenia and the group of CEECs, the countries from SEE are not that successful so far in the "catching up" process with the high developed European partners. Though advancing some progress during the last decade, the Balkan countries (with the notable exception of Croatia) register levels of GDP per capita in PPP which are less than half in terms of EU-27 average (in the case of Albania and Bosnia &Herzegovina - less than 1/3).

Based on economic theory and empirical research, factors determining the speed of convergence are: initial conditions, success of structural reforms, and macroeconomic stability (Fischer and Sahay, 2000). In the later phases of transition, determinants of economic growth of less developed countries are more or less the same as in the most developed economies and are related to quality of human and fixed capital in the broadest sense. [3, 2010, p.67]

As we have already emphasized that development is much more than economic growth, in order to describe and assess the human development changes across the SEE region over the past twenty years we shall use the best known composite indicator, measuring the economic and social development - the UNDP's Human Development Index (HDI). It attempts to show in a single measure a country's living conditions expressed not only in terms of production (per capita GDP, for example), as was commonly done in the past, but also of education and health. It measures the average achievements in a country in three basic dimensions of human development: a long and healthy life, access to knowledge and a decent standard of living. The HDI is the geometric mean of normalized indices measuring achievements in each dimension.

Unfortunately, the HDI is available only for three SEE countries for the period 1990-2010; the available data are presented in table 3. After the initial transition shock when there was deterioration in the value of the index, all the countries recorded a steady increase in the HDI since 1995. In the most recent period 2005-2010, however, their HDI growth was not sufficient in relative terms to keep their ranks. Except Romania and Macedonia, all the countries underwent a negative change in the global HDI ranking from 2005 to 2010.

**Table 4.** Human development index trends in CEE

| HDI rank' 2010 | Country / Year | **HDI value** | | | | | | **HDI rank change** | | **Average annual growth rate (%)** | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | ***1990*** | ***1995*** | ***2000*** | ***2005*** | ***2009*** | ***2010*** | *2005-10* | *2009-10* | *1990-2010* | *2000-10* |
| 29 | **Slovenia** | .. | 0,743 | 0,780 | 0,813 | 0,826 | 0,828 | 0 | 0 | .. | 0,59 |
| 49 | **Montenegro** | .. | .. | .. | 0,755 | 0,768 | 0,769 | -1 | 0 | .. | .. |
| 50 | **Romania** | 0,688 | 0,674 | 0,690 | 0,733 | 0,764 | 0,767 | 1 | 1 | 0,54 | 1,06 |
| 51 | **Croatia** | .. | 0,690 | 0,720 | 0,752 | 0,765 | 0,767 | -2 | -1 | .. | 0,63 |
| 58 | **Bulgaria** | 0,678 | 0,678 | 0,693 | 0,724 | 0,741 | 0,743 | -1 | -1 | 0,46 | 0,69 |
| 60 | **Serbia** | .. | .. | .. | 0,719 | 0,733 | 0,735 | -1 | -1 | .. | .. |
| 64 | **Albania** | 0,647 | 0,633 | 0,670 | 0,700 | 0,716 | 0,719 | -1 | 0 | 0,52 | 0,70 |
| 68 | **Bosnia and Herzegovina** | .. | .. | .. | 0,698 | 0,709 | 0,710 | -4 | 0 | .. | .. |
| 71 | **Macedonia, FYR** | .. | 0,634 | 0,660 | 0,678 | 0,697 | 0,701 | 1 | -1 | .. | 0,61 |

**Source:** UNDP

Out of 169 countries surveyed in the Human Development Report'2010, as distinct from Slovenia (29$^{th}$ place) and the Vishegrad-4 which are in the top or "very high" human development category, the SEE countries are all in the second "high human development" HDI quartile. Among them the highest rank achieved Montenegro – no. 49, while the worst position is for Macedonia – 71. The EU member state Bulgaria ranks 58-th and besides the candidate countries Montenegro and Croatia, falls behind states with authoritarian regimes like Cuba and Libya.

The HDI has been of great value in showing the role of social together with economic factors for the overall welfare in a composite index. However, the scientific, as distinct from advocacy, value of the HDl

lies not so much in the overall or average result as in the contrast among its component values. Countries may be very similar in their average HDI values, but differ greatly in the composition of the components. For example Trinidad & Tobago which has lower social achievements but more than twice higher income per capita than Serbia, has a similar HDI value of 0.736.

**Table 5.** Human development index and its components for CEE in 2010

| HDI rank' 2010 | Country/Year | **Human Development Index (HDI)** 2010 (value) | **Life expectancy at birth** 2010 (years) | **Mean years of schooling** 2010 (years) | **Expected years of schooling** 2010 (years) | **GNI per capita** 2010 (PPP US$ 2008) | **GNI per capita rank minus HDI rank** 2010 | **Non-income HDI value** 2010 |
|---|---|---|---|---|---|---|---|---|
| 29 | **Slovenia** | **0,828** | 78,8 | 9,0 | 16,7 | 25 857 | 3 | 0,853 |
| 49 | **Montenegro** | **0,769** | 74,6 | 10,6 | 14,4 | 12 491 | 16 | 0,825 |
| 50 | **Romania** | **0,767** | 73,2 | 10,6 | 14,8 | 12 844 | 13 | 0,820 |
| 51 | **Croatia** | **0,767** | 76,7 | 9,0 | 13,8 | 16 389 | -2 | 0,798 |
| 58 | **Bulgaria** | **0,743** | 73,7 | 9,9 | 13,7 | 11 139 | 10 | 0,795 |
| 60 | **Serbia** | **0,735** | 74,4 | 9,5 | 13,5 | 10 449 | 11 | 0,788 |
| 64 | **Albania** | **0,719** | 76,9 | 10,4 | 11,3 | 7 976 | 19 | 0,787 |
| 68 | **Bosnia and Herzegovina** | **0,710** | 75,5 | 8,7 | 13,0 | 8 222 | 12 | 0,771 |
| 71 | **Macedonia, FYR** | **0,701** | 74,5 | 8,2 | 12,3 | 9 487 | 3 | 0,742 |

**Source:** UNDP

**What indeed is remarkable about the SEE, in comparison with most other, countries (and this applies also to many other ex-Eastern bloc republics) is the wide divergence between their HDI and non-income HDI values. Except for Croatia, the values of the social far exceed those of the economic components of** the combined index in SEE. Respectively, their rankings according to GNI per capita indicator is between 3 (for Macedonia) and 19 (for Albania) positions lower than according to the aggregate HDI including their achievements in the field of health and education.

Ranis, Stewart and Ramirez (2000) provide evidence of interconnections between economic growth and HD, which gives rise to virtuous or vicious cycles, with good or bad performance on HD and economic growth reinforcing each other. As SEE countries have higher performance on HD than on economic growth it can be classified as HD-lopsided performance. [1] According to the authors such cases of lopsided development are unlikely to persist. Either the weak partner in the cycle eventually acts as a brake on the other partner, leading to a vicious cycle case, or, if the linkages are strengthened, a virtuous cycle case results. Thus, the task of SEE governments is to conduct such policies that take full advantage of the available human capital, making it possible to move their economies from HD-lopsided to virtuous category on a sustainable basis. The important message the authors wanted to convey is that HD must be strengthened before a virtuous cycle can be attained. Policy reforms which focus only on economic growth are unlikely to succeed. Countries in a virtuous cycle category may well slip back into HD-lopsidedness, if, for some reason, growth slows down, but as long as HD stays high such cases have a good chance of resuming their virtuous cycle pattern. [8, 2000, p. 213 ]

**The problems of the SEE countries in transition, at any rate, differ fundamentally from those of most of the third world where, except in some of the oil-rich countries, economic backwardness has**

[1] Country performance can be classified into four categories: virtuous, vicious and two types of lop-sidedness, i.e. lopsided with strong HD/weak growth (called HD-lopsided); and lopsided with weak HD/ strong economic growth (EG-lopsided). In the virtuous cycle case, good HD enhances growth, which in turn promotes HD, and so on. In the vicious cycle case, poor performance on HD tends to lead to poor growth performance which in turn depresses HD achievements, and so on.

**been matched by social retardation. The SEE region in this sense shows quite different profiles. Even the countries worst hit by** economic downturn during transition have retained a relatively high level of education and healthcare. Aspects that depend directly on personal incomes or government expenditure have been the most affected, while others, related to past conditions, have been relatively unaffected. High cultural levels, professional skills, as well as a good all-round education leading to virtually universal literacy, carried forward from the past, have remained almost unchanged in SEE.

Education under the socialist regimes was free, widely available, with virtually full enrolment during the compulsory stage and high rates of enrolment at upper secondary level. Girls shared schooling equitably with boys. Criticism was levelled at quality and content. Education was said to be insufficiently geared to individual children, more to requirements of the labour market, excessively specialised at the upper secondary level as regards subjects, thus restricting opportunities. Both positive and negative features of the pre-transitional era in education have been carried forward to the transitional period, and are being gradually modified in the light of international experience. [9, 2004, p.110]

One significant drawback of the HDI is that it captures just quantitative aspects of education and omits the qualitative performance. Here we can take advantage of the World Economic Forum Global Competitiveness Report. According to it in terms of quality of higher education, all SEE states (except for Montenegro) rank behind 53-rd position out of 139 surveyed nations in 2010. This means that the quality of higher education is low according to international standards and represents competitive disadvantage for SEE economies. The same applies for the sub-index "on the job training" where the lagging behind of SEE in international comparison is even more pronounced. In a market economy and fast technological changes it is crucial that the labour force is flexible and able to constantly upgrade and update its skills. SEE countries however do not actively apply the principle of lifelong learning and take advantage of the possibility to train the employees according to the necessities of the specific job.

**Table 6.** Rankings according to selected sub-indexes of the Global Competitiveness Index' 2010-11

| Countries | Quality of education | On the job training | Brain drain |
|---|---|---|---|
| Albania | 68 | 78 | 107 |
| Bosnia & Herzegovina | 71 | 136 | 138 |
| Bulgaria | 70 | 114 | 127 |
| Croatia | 54 | 95 | 122 |
| Macedonia, FYR | 57 | 112 | 126 |
| Montenegro | 41 | 70 | 55 |
| Romania | 64 | 92 | 116 |
| Serbia | 75 | 119 | 136 |
| Slovenia | 26 | 42 | 48 |

**Source:** The World Economic Forum, The Global Competitiveness Report 2010-2011

The inadequate performance in terms of quality of higher education and on the job training of SEE countries provides evidence of poor human capital utilisation and investment. The situation is further complicated by gloomy demographic outlook:

- Most of the countries surveyed have low birth rates, thus shrinking working age populations, with far reaching consequences on the labour market and society. Projections of population change from 2010 to 2020 indicate a declining number of residents in five out of the eight surveyed countries, thus they are confronted with a declining and ageing population (table 7).
- All the countries in the region have seen temporary or permanent emigration of a significant proportion of their labour forces. They are suffering from an exodus of their young and well educated people to higher developed nations within the EU or beyond – while it is unclear how these same countries could be attractive for either immigration or return of former emigrants. A severe "brain drain" could be fatal for an economy in a course of transformation, leaving it no chance to upgrade to higher value-added activities. As obvious from table 6, except for Montenegro, all SEE nations perform very badly in the WEF rankings according to the sub-index "brain drain", while Bosnia & Herzegovina and Serbia are even among the four worst affected in the world.

**Table 7.** SEE population prospects and net migration

| Countries / Years | Population prospects (thousands) | | | Net migration | | | |
|---|---|---|---|---|---|---|---|
| | 2000 | 2010* | 2020* | 1990 | 1995 | 2000 | 2005 |
| Albania | 3 068 | 3 169 | 3 338 | 22 871 | -423 285 | -267 190 | -100 000 |
| Bosnia & Herzegovina | 3 694 | 3 760 | 3 677 | -24 141 | - 1 025 000 | 281 795 | 61 825 |
| Bulgaria | 8 006 | 7 497 | 7 017 | -186 395 | - 348 503 | -108 444 | -41 325 |
| Croatia | 4 505 | 4 410 | 4 318 | 6 922 | 152 675 | -160 000 | -12 896 |
| Macedonia, FYR | 2 012 | 2 043 | 2 046 | -14 960 | -27 472 | -7 000 | -10 000 |
| Montenegro | 661 | 626 | 631 | -3 841 | 15 000 | 15 000 | -51 362 |
| Romania | 22 138 | 21 190 | 20 380 | -120 971 | -529 205 | -350 000 | -270 000 |
| Serbia | 10 134 | 9 856 | 9 783 | 27 488 | 450 566 | -147 889 | -338 544 |
| Slovenia | 1 985 | 2 025 | 2 053 | 20 761 | 37 738 | 24 206 | 22 519 |

* medium variant

**Source:** United Nations Population Division, World Population Prospects: The 2008 Revision; The World Bank

Another challenge for the CEE countries is to avoid the risk of landing on the wrong side of the digital divide – and thus precluding their citizenship from accessing future channels of knowledge dissemination. The poor record of connecting people to modern communication technologies (table 8) represents a waste of resources as access to multimedia networks allows more efficient processes to develop and makes possible advanced services and products to disseminate widely.

**Table 8. Internet users** (%, population age 16-74)

| | 2000 | 2005 | 2008 | 2009 |
|---|---|---|---|---|
| Austria | 33,7 | 58 | 72,9 | 73,5 |
| Bosnia and Herzegovina | 1,1 | 21,3 | 34,7 | 37,7 |
| Bulgaria | 5,4 | 20 | 39,7 | 45 |
| Croatia | 6,6 | 33,1 | 44,2 | 50,6 |
| Czech Republic | 9,8 | 35,3 | 63 | 64,4 |
| Hungary | 7 | 39 | 61 | 61,8 |
| Montenegro | | 28,8 | 41 | 44,9 |
| Romania | 3,6 | 21,5 | 32,4 | 36,6 |
| Serbia | | 26,3 | 37,2 | 41,7 |
| Slovenia | 15,1 | 46,8 | 57,7 | 64,3 |
| Macedonia, FYR | 2,5 | 26,5 | 46 | 51,8 |

**Source:** International Telecommunications Union

**Finally, SEE countries need to identify approaches to increase the knowledge and research intensity of their economies, thus creating better jobs and opportunities for high skilled people, fully exploiting their productivity potential.** Formation of knowledge-based industries is an essential part of the transition process and can underpin sustainable growth. So far, SEE countries have not succeeded in translating their relatively good stock of human capital and infrastructure into globally successful innovation. Despite the rapid industrial restructuring, they have been more or less locked into low value-added economic activity in contrast with the requirements of the new techno-economic paradigm. Unless preceded or accompanied by substantial improvement in the human development the transition to a knowledge-based economy couldn't be attained.

## 3. Conclusion

As human development has been defined as "the process of enlarging people's choices", the collapse of the socialist system and the transition from a planned to a market economy is seen as a major step in achieving it. The introduction of democratic practices, however, while an enormous achievement did not necessarily translate into sustained human development attainments on other fronts in the SEE. Among the multiple factors behind the underperformance of the region except the war conflicts, are to some extent the lack of strategic economic policy and uncritical following of the prescriptions of the Washington consen-

sus. Despite high economic growth rates during the last decade, which didn't bring about adequate improvement in employment though, SEE countries lag far behind in terms of human development not only old EU member states but also their peers from CEE.

Moreover, the long term growth prospects of the SEE region are at stake as it faces daunting challenges - adverse demographic developments, compounded by a persistent brain-drain and inadequate improvement and underinvestment in the educational system and vocational training. At the same time the exceeding of the values of the social over the economic component of the Balkan countries' human development indices shows that they do not take full advantage of their human capital to advance economic development.

It should be strongly emphasized, however, that no other resource but human capital can be the basis for sustainable progress in SEECs. The largest lever for them to pull for further economic advancement is to focus on investment in and deployment of human capital. Focussing on human lives as the end of development should frame the analysis of almost any development challenge and drive the agenda of policy concerns that will be addressed.

The policy-making circles must realize the fact that the decisive economic resources of the future will be knowledge and education. They need to identify strategic approaches to mobilise and deploy the available human resources and to evolve from boasting merely efficiency-driven growth towards being genuinely innovation-driven economies. Today, SEE must compete in world markets on the basis of skills, talents and competences, not anymore on their low labour costs.

Being able to find the right answers to the socio-economic challenges and create stronger link between human development and economic growth will determine the future of South Eastern Europe more than anything else – and with it the prosperity and social peace of all of Europe.

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# PROFITABILITY, EFFICIENCY AND LIQUIDITY OF GREEK BANKS IN BULGARIA

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**Summary**

*The analysis of the banking sector has been the study of several researchers. This work will evaluate the profitability and efficiency of the profitability of Greek banks operating in Bulgaria for the period 2004-2010. To achieve this, the present state of Greek banks operating in Bulgaria, and the formation of economic fundamentals are analysed as well as the key ratios. Also a comparative analysis of the path of economic aggregates and indicators of Greek banks operating in Bulgaria with those of the parent banks in Greece, and the whole banking sector in Greece and Bulgaria is presented, respectively.*

*For the analysis of financial figures of Greek banks operating in Bulgaria, groups of ratios, such as profitability-efficiency, liquidity, capital adequacy are used. Through the analysis of these ratios, the configuration of the respective sizes, both between individual banks and over time is compared. Also, the configuration of the above figures is compared with those of the entire banking sector in Greece and Bulgaria. Additionally, through the above analysis, the causes of changes over time are identified. Important information about the impact of economic crisis on these indicators is deduced, as well. Finally, the comparative analysis of banks in total banking sector in Greece and Bulgaria can provide secure data on the economy of both countries and especially on investments.*

**Keywords:** banks, banking, profitability, efficiency, liquidity
**JEL Classifications:** E51, E52, G21

## 1. INTRODUCTION

Of the twenty years that have elapsed since the change of socioeconomic system in Bulgaria, there have been important elements for consideration in the broader economy. The characteristics of the Bulgarian economy have changed greatly in the early years of change. The financial system has also changed dramatically. At the end of 1990 there were 70 operating commercial banks while in 1991 the number of banks reached a record of 78. In early 1997, international financial institutions imposed conditions on the Bulgarian government to stabilize the Bulgarian economy. The measures adopted emphasize restructuring of the banking sector which is in a period of intense instability. The Bulgarian National Bank changed radically reducing significantly the strategic refinancing and improving incentives for commercial banks. (Dimas 2007).

This process of reform of the banking system, which is part of the changes across the economy, created the conditions for investment by foreign banks in Bulgaria. The Greek banking system realizing the dynamics and prospects of the region in the Balkans and the SE Europe plays an important role in the development of the banking sector in these areas. Greek banks face the Balkans as a single economic market and pursue their activities to improve their overall profitability, as gradually the Greek banking market, particularly the area of retail banking, has now surpassed the levels of maturation, showing a series of problems, combined with the prolonged economic crisis. The extroversion of the banking system in Greece is not just a simple financial expansion in the Balkans. It is in fact an organizational modernization at all levels of operation, the dynamic involvement in financing activities both Greek and foreign entre-

preneurship across national borders. Namely in Bulgaria, the Greek banks, both through autonomous growth and through acquisitions and mergers, hold a significant market share and plan further significant expansion both in the branch network and banking operations.

The year 2007 was a milestone for Bulgaria since at the beginning of that year it became a member of the European Union. In Bulgaria, banking activities coming from the side of Greece and other foreign countries did not present considerable interest. The total amount of banking mergers and acquisitions in Bulgaria from 2004 to 2006 was $ 265,97 millions for the Greek banks. More specifically the Greek banks that played a leading part in the cross border mergers and acquisitions were the EfgEurobank and the Piraeus Bank, which bought out the DZI Bank and the Eurobank (Bulgarian) respectively.[1] The participation percentages as well as the acquisition amounts are shown in Table 1 below[2].

**Table 1.** Greek Banks that bought out banks in Bulgaria

| Greek Bank Buyer | Bulgarian Bank Target | Percentage of participation | Amount of Acquisition (USD million) |
|---|---|---|---|
| Eurobank | DZI Bank | 74,26% | 200,20 |
| Piraeus Bank | Eurobank | 99,70% | 65,77 |
| | | **Total** | **265,97** |

**Source:** Mergerstat. Intellinet. Bloomberg. Athens Stock Exchange

The total amount of bank mergers and acquisitions in the country of Bulgaria from countries other than Greece during the period 2004-2006 in million USD amounted to 532.56 and the particular banks that played a leading role in mergers and acquisitions in the region of Bulgaria is the Novator UK, the Austrian Bank of Austria and the Hungarian OTP Bank. The participation percentages as well as the acquisition amounts of bank mergers and acquisitions in Bulgarian banks by foreign banks are shown in Table 2 below[3].

**Table 2.** Other countries that bought out banks in Bulgaria.

| Foreigner Bank Buyer | Bulgarian Bank Target | Country of the Bank Buyer | Percentage of participation | Amount of Acquisition (USD million) |
|---|---|---|---|---|
| Novator | EIBank | United Kingdom | 18,27% | 30,01 |
| Bank Austria | Herbros Bank | Austria | 99,90% | 127,20 |
| OTP Bank | DSK Bank | Hungary | 100,00% | 375,35 |
| | | | **Total** | **532,56** |

**Source:** Mergerstat. Intellinet. Bloomberg. Athens Stock Exchange

Foreign Buyer Bulgarian Bank Country Bank aims Buyer Participation Redemption Amount

The Bulgarian banking system is dominated by foreign banks. The percentage of total capital controlled by foreign banks increased gradually from 38% in 1999 to 76% in 2005. The banks purchased by foreigners went to a radical restructuring, but in the process they lost some market share. For example, Bulbank in 1999, before the acquisition by UniCredito had a market share of assets up to 25%, while in 2005 had a share of 10%. Instead, local private banks strengthened gradually increasing their market share by lending to customers at 21% in 2005 from 15% in 1999. In 2005, the 8 domestic private banks operat-

[1] Kyriazopoulos G., Petropoulos D., (2011) «How the cross border mergers and acquisitions of the Greek banks in the Balkan area improve the course of profitability, efficiency and liquidity indexes of them? » 8th AFE Samos Greece

[2] Kyriazopoulos G., Petropoulos D. (2010) "Cross-border Mergers and Acquisitions of Greek Banks in Balkan countries after the introduction of Euro in Greece." ESDO Kavala

[3] Kyriazopoulos G., Petropoulos D. (2010) "Cross-border Mergers and Acquisitions of Greek Banks in Balkan countries after the introduction of Euro in Greece." ESDO Kavala

ing in the country controlled only 24% of the funds of the banking system and the two state banks about 2%.[1]

The banking system in Bulgaria has already entered a new phase of developments, through domestic mergers and acquisitions, which will bring further significant changes. Mergers and collaborations between two or more credit institutions should set up banks with strategic market leadership. The merger of UniCredito Italian with the German Hypo-Vereinsbank (HVB), which ended on June 15, 2005, resulted in the creation of new balances in the banking market in Bulgaria. UniCredito and HVB control three banks in Bulgaria: Bulbank (in terms of UniCredito) and HVB Biochim (formerly Biochim Commercial Bank) and Hebrosbank (in terms of HVB). The merger of Bulbank, HVB Bank Viochim and HebrosBank will create a huge financial institution, bringing together the market shares unfeasible for competitors. Moreover, the first half of 2006 the branch union of Piraeus Bank and its subsidiary Piraeus Eurobank AD resulted in the creation of a bigger bank that occupies the eighth position in the ranking, surpassing the Economic Investment Bank, SG-Express Bank and DZI Bank, which held respectively in the eighth, ninth and 10th place in 2005. Dominant position in the banking market in Bulgaria has UniCredito group with a share of assets under 21.8% in 2005 and share of lending by 21.9%, followed by the Hungarian OPT Bank, after the acquisition of DSK Bank, with a share of assets under 13.6% and a 16.3% share of loans[2].

Overall, the country with the largest penetration in the banking market in Bulgaria is Greece, after the recent acquisition of DZI Bank by EFG Eurobank-Labour. In June 2006 the five large Greek banking groups attracted 23.6% of the funds of the banking system and 26.2% of loans to customers (Kyriazopoulos Petropoulos D. ESDO Kavala 2010).

The Greek banks analyzed in this work are the National Bank, Alpha Bank, the Eurobank, Emporiki Bank and Piraeus Bank. The above five banks are essentially the Greek presence in the Greek banking system in Bulgaria. The NBG Group is active in Bulgaria through its subsidiary bank, United Bulgarian Bank AD. The United Bulgarian Bank AD is among the three largest banks in Bulgaria, with a market share of 12% of total loans and 16% in deposits. The Alpha Bank currently holds 12% of total loans and 16% in deposits. The Eurobank through the acquisition of 98.7% of the Bulgarian Postbank owns 12% of total loans and 16% in deposits. The Emporiki Bank, through its subsidiary Emporiki Bank Bulgaria EAD owns 12% of total loans and 16% in deposits. Piraeus Bank acquired in 2005 the Eurobank (Bulgarian commercial bank) and has a presence in all of Bulgaria. It holds 12% of total loans and 16% in deposits.

## 2. METHODOLOGICAL APPROACH

The purpose of the paper is to present and assess the economic fundamentals of these banking institutions operating in Bulgaria and make a comparative analysis with the whole banking sector in Bulgaria.

The analysis is performed for the seven years 2004-2010. This period includes the three years (2008-2010) of financial crisis, so the image and the behavior of financial indicators are more meaningful.

The analysis of financial statements of a company includes, in addition to the selection of an appropriate index, the comparison, without which the concluded ratios do not become important and most likely not lead to a correct interpretation. The comparison is made in relation to time and in relation to similar businesses or fields. This double comparison allows correct interpretation of the indicators and thus of status of the business (Papoulias, 2000).

To accomplish this, the economic fundamentals of the banks will be analysed. The economic fundamentals are: 1. Total Assets, 2. Total Deposits, 3. Total Loans, 4. Net Profit before taxes, and 5. Total Equity.

The analysis of the above financial elements refers to the study of the relations of economic data, at present and over time. For the above financial figures - in this work - the percentage change for the time period considered is presented. Also for the above figures, the percentage participation in total banking sector in Bulgaria is shown. Further analysis is made of the following three ratios recorded in the literature as the most convenient indicators measuring the economic size and characteristics of banks: profitability, efficiency, liquidity.[3]

[1] Kyriazopoulos G., Petropoulos D. (2010) "Cross-border Mergers and Acquisitions of Greek Banks in Balkan countries after the introduction of Euro in Greece." ESDO Kavala

[2] Kyriazopoulos G., Petropoulos D. (2010) "Cross-border Mergers and Acquisitions of Greek Banks in Balkan countries after the introduction of Euro in Greece." ESDO Kavala

[3] Petropoulos D., Kyriazopoulos G., (2010) «Profitability, efficiency and liquidity of the Co-operative banks in Greece» ICOAE Athens.

**a. Profitability - Efficiency**[1]

a.1 ROA = Net profit / Total Assets (reflects the ability of management to effectively use financial resources (assets) at its disposal in order to generate profits).

a. 2 ROE = Net profit / Equity (shows the efficiency with which the bank uses the funds of the owners, as it shows the size of profits generated by the funds invested by shareholders-owners of the bank-firm) (Vasileiou, 1999).

**b. Liquidity**

b.1 Loans / Deposits (Shows the need for banks in relation to loans and deposits. Without the necessary liquidity to meet its obligations, a bank may fail).

b.2 Total Assets / Total Loans (Indicates the proportion of loans retained by the Bank. High price means low efficiency and low risk).

The use of indicators is one of the most widely used and powerful methods of financial analysis.

## 3. RESULTS

### A. Financial figures

The financials of a company provide information to those interested in the business units to take right decisions. The absolute economic figures are presented in the table 3 for the year 2010. Changes in financial figures show us the trend and dynamics of these companies during the reporting period. These changes are presented in Table 4

**Table 3.** Economic Figures of the Year 2010 in Lev[2].

| Greek Banks | Total Assets | Total Deposits | Total Loans | Net Income before taxes | Total Equity |
|---|---|---|---|---|---|
| Piraeus Bank | 4.077.093 | 3.496.143 | 3.760.351 | 49.448 | 563.628 |
| Commercial Banks | 559.100 | 496.164 | 448.781 | -7.393 | 59.270 |
| Alpha Bank[3] | 2.020.205 | 2.172.082 | 1.777.838 | -78.734 | -158.668 |
| Eurobank | 6.309.255 | 5.414.990 | 5.139.666 | 38.644 | 782.424 |
| National Bank of Greece | 7.460.917 | 6.345.413 | 5.818.555 | 81.883 | 1.100.839 |
| **Sub - Total** | **20.426.570** | **17.924.792** | **16.945.191** | **83.848** | **2.347.493** |
| **Total of the Bulgarian Banking Sector** | **73.725.696** | **62.857.225** | **58.417.720** | **693.567** | **10.032.261** |

**Source:** Bulgarian National Bank (Central Bank) / Our Process

From the analysis of the table 4 below we ascertain the continuous growth of the examined Greek banks. This growth took place because of the expansion of the banks' branches. This growth is due to the expansion of branches of banks, as well as in mergers and acquisitions of the Bulgarian banks. We also find that the growth exceeds the rate of change of these economic magnitudes for the whole banking sector in Bulgaria. Exception are presented in the net profit before taxes, where all five examined banks declined by 17% compared with growth of 28% of total banking sector in Bulgaria.

**Table 4.** Percentage Changes in the Economic Elements in the Years 2004-2010

| Greek Banks | Total Assets % | Total Deposits % | Total Loans % | Net Profit before Taxes % | Total Equity % |
|---|---|---|---|---|---|
| Piraeus Bank | 856,00 | 753,00 | 936,00 | 466,00 | 5.530,00 |
| Commercial Bank | 548,00 | 1084,00 | 560,00 | -523,00 | 156,00 |
| Alpha Bank | 1404,00 | 1591,00 | 1568,00 | -4003,00 | -3.224,00 |
| Eurobank | 769,00 | 712,00 | 1862,00 | 811,00 | 682,00 |

[1] Vasileiou D. (1999) "Financial Management" OUP, Patras

[2] Today the exchange rate of the euro stands at 1.90 Lev.

[3] The Alpha Bank operates as a branch of the corresponding Greek bank. So the losses in the branch of Bulgaria, plotted as negative equity on the balance sheets of the branch

| | | | | | |
|---|---|---|---|---|---|
| National Bank of Greece | 211,00 | 222,00 | 287,00 | -4,00 | 236,00 |
| **Sub - total** | 442,00 | 457,00 | 636,00 | -17,00 | 403,00 |
| **Total of the Bulgarian Banking Sector** | 195,00 | 221,00 | 337,00 | 28,00 | 267,00 |

**Source:** Bulgarian National Bank (Central Bank) / Our Process

An analysis of Table 5 shows the continued growth of the reported banks. This growth is due to the expansion of branches of banks, as well as to acquisitions and mergers of Bulgarian banks. We also note that the growth exceeds the rate of change of these figures for the whole banking sector in Bulgaria. With the exception of the Net Profit before tax, where all five examined banks declined by 17%, total banking sector in Bulgaria increased by28%. An analysis of Table 5 also shows the strong presence of five concerned banks in total banking sector in Bulgaria. All financial figures in question have almost doubled at the end of the period (2010) and formed approximately 30% of total banking sector in the country. The Net Profits before taxes, which are declining in 12.09 from 18.98 in 2004 are an exception.

**Table 5.** Percentage Participation of the Greek Banks in the total of the Bulgarian banking sector

| | **Total Assets** | | **Total Deposits** | | **Total Loans** | | **Net Profit before Taxes** | | **Total Equity** | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Greek Banks** | **2004** | **2010** | **2004** | **2010** | **2004** | **2010** | **2004** | **2010** | **2004** | **2010** |
| Piraeus Bank | 1,71 | 5,53 | 2,10 | 5,56 | 2,72 | 6,44 | 1,62 | 7,13 | 0,38 | 5,62 |
| Commercial Bank | 0,35 | 0,76 | 0,21 | 0,79 | 0,51 | 0,77 | 0,32 | -1,07 | 0,87 | 0,59 |
| Alpha Bank | 0,54 | 2,74 | 0,66 | 3,46 | 0,80 | 3,04 | 0,37 | -11,35 | 0,19 | 1,58 |
| Eurobank | 2,91 | 8,56 | 3,41 | 8,61 | 1,96 | 8,80 | 0,79 | 5,57 | 3,67 | 7,80 |
| National Bank of Greece | 9,62 | 10,12 | 10,07 | 10,09 | 11,25 | 9,96 | 15,87 | 11,81 | 11,98 | 10,97 |
| **Sub - Total** | 15,13 | 27,71 | 16,45 | 28,51 | 17,24 | 29,01 | 18,97 | 12,09 | 17,09 | 26,56 |
| **Total of the Bulgarian Banking Sector** | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 | 100 |

**Source:** Bulgarian National Bank (Central Bank) / Our Process

Analyzing the individual contribution of the five banks concerned we note the large presence of National Bank of Greece through its subsidiary bank United Bulgarian Bank AD, followed by Eurobank and Piraeus Bank taking the third place. The next two banks (Emporiki Bank and ALPHA BANK) operate as subsidiaries of their respective Greek banks and have not acquired or merged with Bulgarian banks.

**B. Ratios**[12]

**a. Profitability - Efficiency**

a.1 ROA = Net profit / Total Assets

Analyzing the specific ratio we can:

- compare the efficiency between cooperative banks
- monitor the effectiveness over time
- compare the efficiency of cooperative banks with the profitability of the entire banking sector
- investigate the causes of changes over time.

An analysis of Table 6 (also see diagram 1 in the appendices) shows that the efficiency of all concerned banks for the first three years of the period (2004, 2005, and 2006) is higher than the profitability of the entire banking sector in Bulgaria. Then, for the years 2007, 2008, 2009, and 2010 it is constantly declining and falling behind the total banking sector in the country. We also note that the change in that index for all five banks concerned is down 84.87%, compared with 56.48% for the whole banking sector.

The main reason for the difference between the subset index of the banks concerned and the index of the entire banking sector in Bulgaria is the fact that they have increased their assets, primarily by establishing new branches.

[1] Petropoulos D., Kyriazopoulos G., (2010) «Profitability, efficiency and liquidity of the Co-operative banks in Greece» ICOAE Athens.

[2] Papoulias, G. (2000) "Financial Management" G. Papoulias, Athens

**Table 6.** Return on Asset (ROA) - Ratio

| Greek Banks | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | % change 2004-2010 | Arithmetic Mean of the 7 Years |
|---|---|---|---|---|---|---|---|---|---|
| Piraeus Bank | 2,05 | 1,40 | 1,43 | 1,13 | 1,57 | 1,41 | 1,21 | -40,98 | 1,46 |
| Commercial Bank | 2,02 | 2,63 | 0,17 | -0,57 | -0,78 | -1,34 | -1,32 | -165,35 | 0,12 |
| Alpha Bank | 1,50 | 1,25 | 0,26 | 0,04 | -1,20 | -3,42 | -3,90 | -360,00 | -0,78 |
| Eurobank | 0,58 | 0,70 | 0,20 | 1,26 | 2,01 | 0,38 | 0,61 | 5,17 | 0,82 |
| National Bank of Greece | 3,56 | 3,51 | 4,23 | 3,36 | 2,99 | 1,37 | 1,10 | -69,10 | 2,87 |
| **Sub - Total** | 2,71 | 2,55 | 2,72 | 1,90 | 1,89 | 0,50 | 0,41 | -84,87 | 1,81 |
| **Total of the Bulgarian Banking Sector** | 2,16 | 2,09 | 2,25 | 2,14 | 2,22 | 1,23 | 0,94 | -56,48 | 1,86 |

**Source:** Bulgarian National Bank (Central Bank) / Our Process

a.2 ROE = Net Profit / Equity

Analyzing the ROE ratio, we can see whether the goal attainment reached a satisfactory outcome. From the data presented in Table 7 (also see diagram 2 in the appendices) we see that while the return on equity ratios of all banks concerned were high for the years 2004-2005 and ranged about the same level as the whole banking sector in Bulgaria, then for the rest of the period 2004-2008, these ratios were considerably reduced. The reduction applies to both the subset of examined banks and individual banks (Commercial Bank, Alpha Bank). Finally we note that the change in that index for the subset of examined banks has decreased by 83.68% while for the whole banking sector the index recorded a decrease of 64.91%.

As causes of the above behavior of return on equity ratios could be cited as follows:

- the increase of the concerned bank branches, was not accompanied by an increase in the share of the Bulgarian market
- over-investment funds of the banks concerned
- non-proportional increase in profits of the subset of the banks concerned and the entire banking sector in Bulgaria. For the period under consideration the profits of the examined banks have fallen by 17.86% while the profits of the entire banking sector in Bulgaria have increased by 28.94%
- large variations in increases in equity among the five examined banks and all banks. For the period under consideration, capitals of the banks concerned have increased by 403% while the equity of the banking sector in Bulgaria has increased by 267.70%

**Table 7.** Return on Equity (ROE) – Ratio

| Greek Banks | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | % change 2004-2010 | Arithmetic Mean of the 7 Years |
|---|---|---|---|---|---|---|---|---|---|
| Piraeus Bank | 84,24 | 59,35 | 21,76 | 10,52 | 13,81 | 9,83 | 8,77 | -89,59 | 29,75 |
| Commercial Bank | 7,37 | 9,11 | 0,82 | -5,95 | -9,42 | -13,7 | -12,47 | -269,20 | -3,46 |
| Alpha Bank | 39,72 | 29,66 | 14,31 | 6,38 | 173,48 | 91,32 | 49,62 | 24,92 | 57,78 |
| Eurobank | 4,22 | 4,15 | 0,65 | 13,55 | 22,58 | 3,06 | 4,94 | 17,06 | 7,59 |
| National Bank of Greece | 26,08 | 26,46 | 29,7 | 27,46 | 24,39 | 10,67 | 7,44 | -71,47 | 21,74 |
| **Sub - Total** | 21,87 | 20,91 | 19,13 | 19,12 | 19,52 | 4,5 | 3,57 | -83,68 | 15,52 |
| **Total of the Bulgarian Banking Sector** | 19,69 | 19,88 | 21,64 | 20,39 | 19,44 | 9,2 | 6,91 | -64,91 | 16,74 |

**Source:** Bulgarian National Bank (Central Bank) / Our Process

**b. Liquidity**

b.1 Loans / Deposits

Analyzing this liquidity ratio, we can observe the possibility of the bank to meet its obligations. Analyzing Table 8 (also see diagram 3 in the appendices) we can see that the loans fell short of savings, both for the five banks concerned, and for the whole banking sector. The Commercial Bank is an exception for the years 2004, 2005, 2009 and the Piraeus Bank for the years 2008, 2009 and 2010. We also note that the specific ratio is increasing both for the five banks concerned, and for the whole banking sector in the country. This continued growth has as a result in 2010 the ratios to stand at 0.95 and 0.93 respectively. Finally we can notice that the average for the reporting period for all five banks increased to 0.86 while for the whole banking sector in Bulgaria at 0.82.

**Table 8.** Direct Liquidity (Total Loans / Total Deposits) – Ratio

| **Greek Banks** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **% Change 2004-2010** | **Arithmetic Mean of the 7 Years** |
|---|---|---|---|---|---|---|---|---|---|
| Piraeus Bank | 88,52 | 75,99 | 78,64 | 98,88 | 102,27 | 108,60 | 107,56 | 21,51 | 94,35 |
| Commercial Bank | 162,23 | 106,97 | 96,29 | 93,97 | 95,85 | 101,23 | 90,45 | -44,25 | 106,71 |
| Alpha Bank | 82,98 | 87,55 | 58,93 | 84,52 | 85,05 | 84,13 | 81,85 | -1,36 | 80,72 |
| Eurobank | 39,30 | 46,51 | 47,40 | 85,58 | 90,43 | 94,00 | 94,92 | 141,53 | 71,16 |
| National Bank of Greece | 76,36 | 84,01 | 90,44 | 94,92 | 99,96 | 93,50 | 91,70 | 20,09 | 90,13 |
| **Sub - Total** | 71,61 | 75,19 | 78,63 | 92,13 | 95,95 | 95,20 | 94,53 | 32,01 | 86,18 |
| **Total of the Bulgarian Banking Sector** | 68,34 | 69,80 | 66,59 | 86,02 | 91,61 | 94,98 | 92,94 | 36,00 | 81,47 |

**Source:** Bulgarian National Bank (Central Bank) / Our Process

b.2 Total Assets / Total Loans

Analyzing Table 9 (also see diagram 4 in the appendices) we can see that this ratio shows large variations and fluctuations. We also notice that the specific ratios are continuously decreasing both for the individual banks concerned, and for the whole banking sector in Bulgaria. Of course in all the figures the ratio was greater than one hundred.

**Table 9.** General Liquidity (Total Assets/Total Loans) – Ratio

| **Greek Banks** | **2004** | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** | **% Change 2004-2010** | **Arithmetic Mean of the 7 Years** |
|---|---|---|---|---|---|---|---|---|---|
| Piraeus Bank | 117,54 | 136,43 | 150,54 | 114,64 | 111,61 | 108,25 | 108,42 | -7,76 | 121,06 |
| Commercial Bank | 126,98 | 132,47 | 132,03 | 119,02 | 114,41 | 110,18 | 124,58 | -1,89 | 122,81 |
| Alpha Bank | 126,02 | 119,91 | 173,70 | 119,26 | 117,34 | 114,96 | 113,63 | -9,83 | 126,40 |
| Eurobank | 276,86 | 245,75 | 235,75 | 131,16 | 124,70 | 123,74 | 122,76 | -55,66 | 180,10 |
| National Bank of Greece | 159,59 | 159,01 | 146,31 | 120,36 | 114,41 | 122,88 | 128,23 | -19,65 | 135,83 |
| **Sub - Total** | 163,80 | 163,54 | 157,17 | 121,64 | 116,74 | 119,06 | 120,54 | -26,41 | 137,50 |
| **Total of the Bulgarian Banking Sector** | 186,71 | 185,21 | 190,92 | 131,61 | 124,72 | 122,65 | 126,20 | -32,41 | 152,57 |

**Source:** Bulgarian National Bank (Central Bank) / Our Process

We can also observe that the change of the particular ratio for all the concerned banks declined by 26.41% while for the whole banking sector it fell by 32.41%.

## 4. CONCLUSIONS

A key conclusion from the present study is that the five Greek banks analyzed – in spite of the relatively short period of operation and expansion in the Bulgarian economy - have recorded a significant size and have occupied a large part of the banking system. This is the result of both acquisitions and mergers (Piraeus, Eurobank), and the dynamic expansion in the domestic market.

From the analysis of financial data of the five Greek banks operating in Bulgaria, their dynamic development is shown as well as their significant presence in the Bulgarian banking system.

The assessment of profitability and efficiency of the five Greek banks operating in Bulgaria is formed at satisfactory levels. More specifically, the respective ratios stood at better levels than the corresponding ratios of all the banks for the years 2004-2006. While for the period 2007-2010 the corresponding indicators fall short of the respective of the entire banking system. This is mainly due to the dynamic expansion of these banks in the Bulgarian market, which was halted by the global economic crisis.

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**Appendices**

In the below 4 diagrams we can see the fluctuation of the 4 examined ratios.

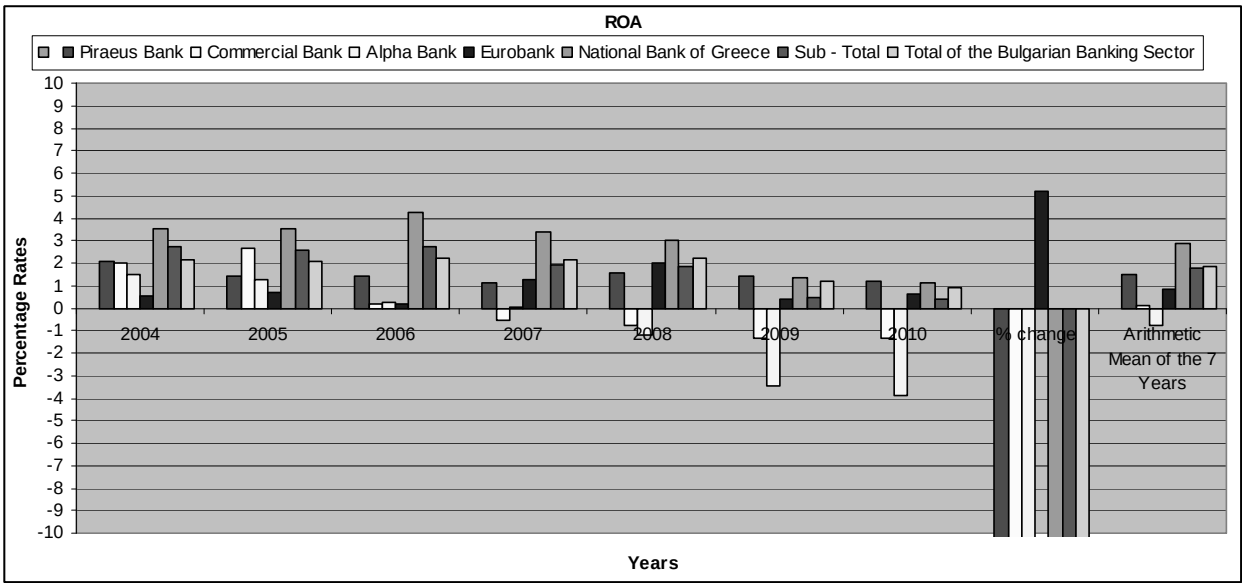


**Diagram 1.** has extracted from the Table 6 that concerns ROA Ratio

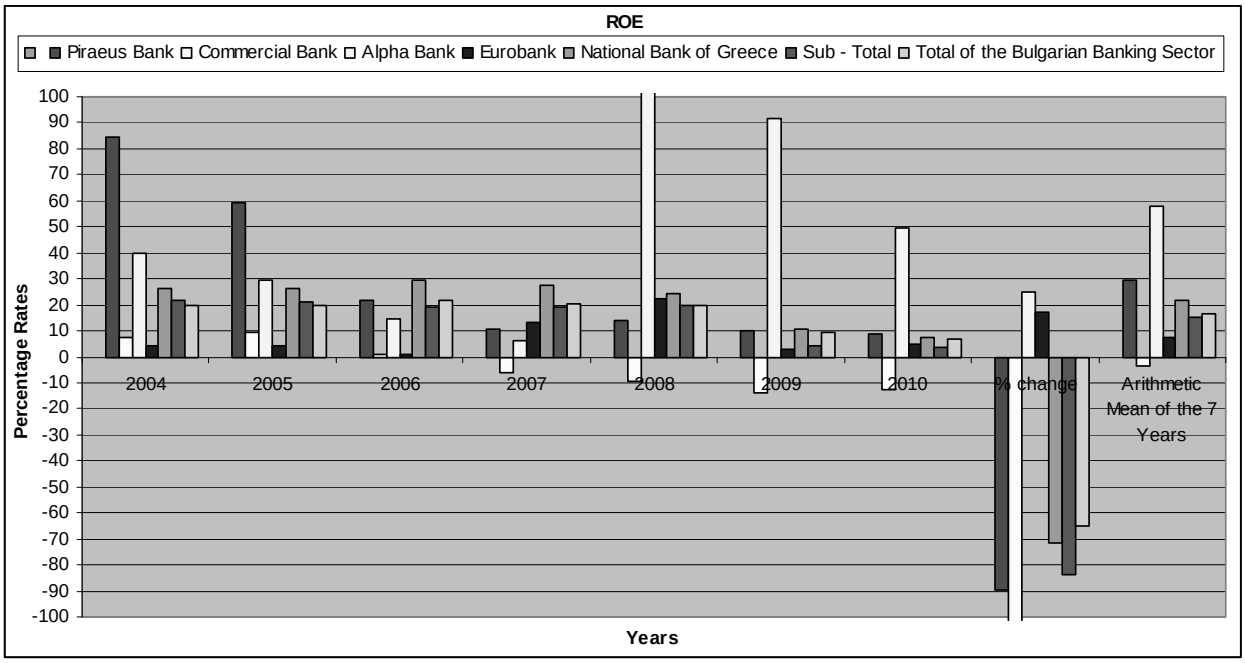


**Diagram 2.** has extracted from the table 7 that concerns ROE Ratio

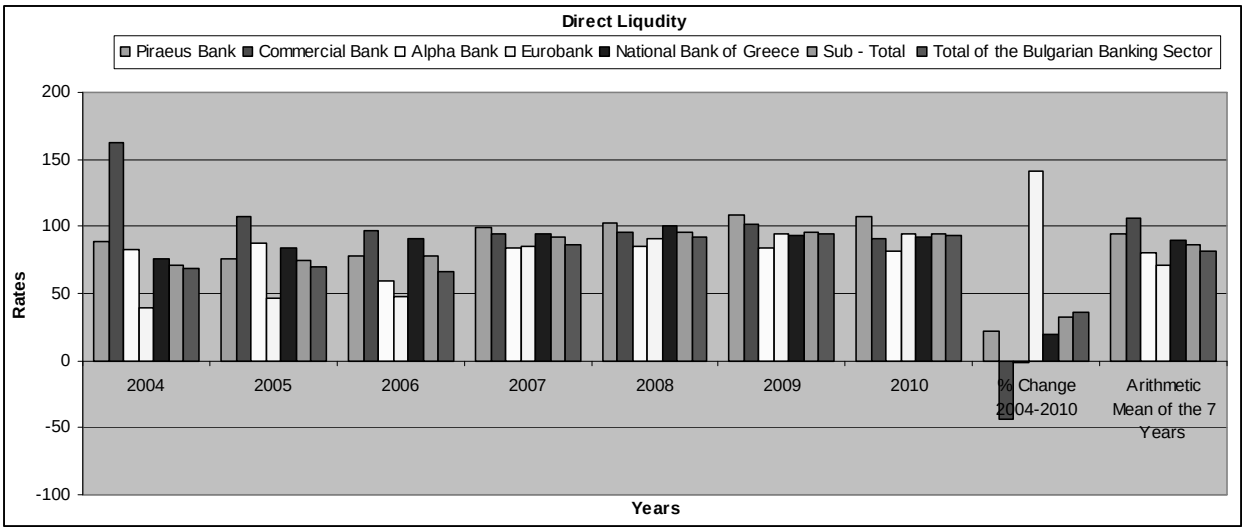


**Diagram 3.** has extracted from the table 8 that concerns Direct Liquidity Ratio

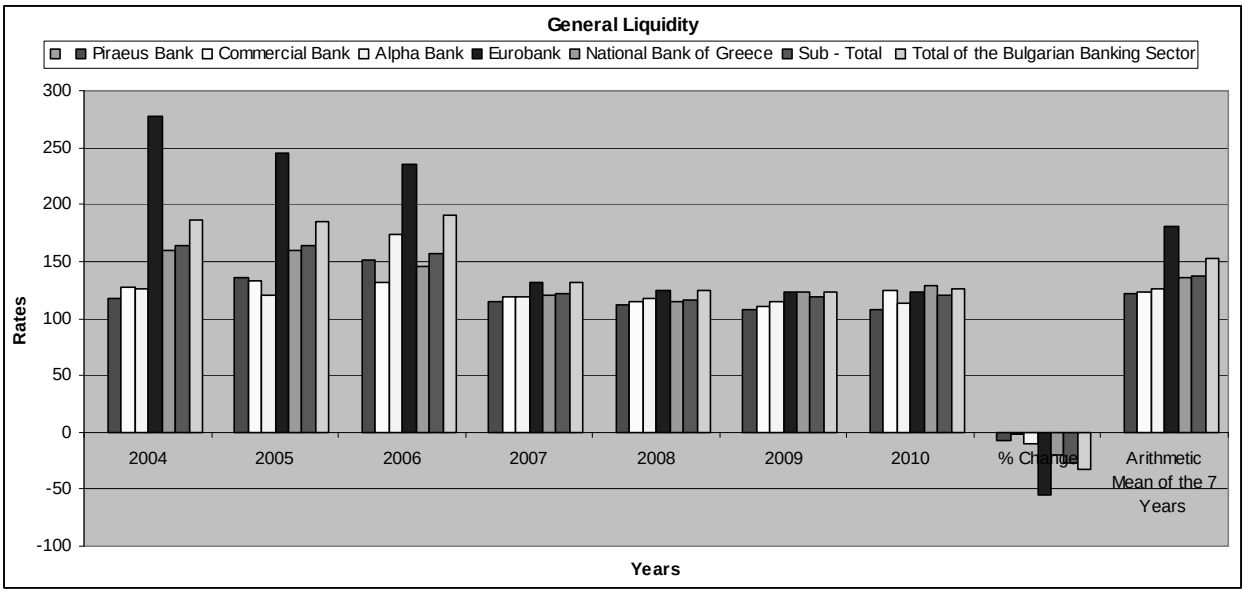


**Diagram 4.** has extracted from the table 9 that concerns General Liquidity Ratio

# ENERGY POLICIES AND SUSTAINABLE DEVELOPMENT OF BULGARIA

**Kiril Radev**[1]

**Abstract**

*This report specifies and analyzes the developed and carried out policies in the national energy sector focusing on the determinants which condition the achievement of optimal energy security and sustainable development of the Republic of Bulgaria. The focus is on the socio-economic understanding of the decisions for strategic development of nuclear energetics and its place and role in national, European and global aspect. The links and dependences between energy factors and macroeconomic indicators have been investigated taking into consideration the conditions of external and internal environment. The results from the analysis are used for elaboration of medium term forecasts of their dynamics where on these grounds different versions have been developed to achieve optimal compatibility between the long term guidelines for development of the national energetics and the strategic objectives for development of the national economy.*

**Key words:** Sustainable development, Strategic management, Crisis management, Change management, Energy security.

The term 'politika' in Bulgarian language originates from the English word "policy". With respect to its contents it is identified with a set of "principles" and/or "rules". In the context of the problems contained in this report we shall admit that **the policy is a process which mainly includes the activities relating to the long term decision making and development of strategies and plans for achievement of common intentions for a certain group of people (guidelines for development).** Whereas it must perform also functions with regard to the sustainable development it must be said also in addition **those which shall favor the achievement of balance between ecology, economic growth and social prosperity.**

Policies are coherent for each of the human group interactions, including corporate, sector, regional and global level.

Each policy, bearing in mind its nature, subject and object is characterized by diversity of perceptions and visions. Upon its determination expert and public consensus must be reached with regard to its principles, rules and norms, and alternatives for their application. It is only when the above said requirements are implemented within the framework of an economic community or union that the task becomes exceptionally complex which on its side imposes that the processes relating to its formulation, introduction, implementation and control to be subject to professional strategic approach and realized by trained especially for the purpose administrations and staff.

In global aspect there exist policies for development of each sector of the public and economic lives which represent a system of interlinked and interdependent rules and norms. Concrete particular examples are the national and the common European policies for development of transport and energetics, communications, socio-economic development, society welfare, combat against poverty etc.

The policies in the field of energetics constitute the basic element of the global socio-economic and ecologic system. The margins of the prices of energy carriers influence the macroeconomic indicators, hence the state and the competitiveness of each sector of the national economies as well. The intensity of their impact on each country presents a function mainly of the degree of its energy security and dependence. The technologies used for energy raw materials have direct influence on decrease of their impact on the global climate changes. In this respect the search for alternative energy sources which shall protect the natural environment and ensure higher living standards for the population is a task of primary significance and priority for the world science.

Being aware of all afore said as well as to ensure sustainable development of the European Union the European Commission has designed a strategy for sustainable development and in consistency with it carries out the main policy for energy sector. Its objectives are as follows:

- Diversification of the deliveries of primary energy carriers;
- Achievement of high level security by type, quantity and time, according to the plans for medium term and long term economic growth in the Community;

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- Creation of sustainable and at the same time flexible European energy market consistent with the factors of external to the Union environment.
- Creation of conditions for development and introduction of innovations aiming at development and application of the most modern energy technologies;
- Decrease of energy consumption of national economies through design and implementation of parallel strategies for taking out of operation energy production appliances and installations which consume huge resources and their replacement with alternatives which for their basic activity shall use non conventional energy carriers (water, sun, wind, biomass etc.);
- Increase of energy effectiveness;
- Fulfillment of the commitments under international treaties and agreements for reduction of greenhouse gases emitted by the energy systems, dust particles etc.

Each of the targets indicated above should be achieved through implementation of relevant sub policies of the common energy policy of the Community. Upon their implementation and development of strategies must be taken into consideration the current problems of the energy sector and sustainable development of the Community. Most significant are the following:

- Market interrelations do not report to a full extent the interests of all layers of society;
- Disruption of ecological balance;
- Unpredictability of climate change;
- Threatening decrease of energy resources storage;
- Inability to achieve balance between the factors of external and internal environment of the European economy, including regional and national scales.

Separately and in a system, the indicated problems are characterized by high intensity growing significantly in the conditions of economic crisis. Therefore, and taking into account the specific characteristics and properties of the sources as well as the essential peculiarities of the identified problems, for the solution of which must be used adaptive methods coherent to the crisis management and change management. In this respect the European Commission should:

- Actively work for achievement of fast and lasting changes of society understanding, public and economic organizations regarding the scope, significance, roles and possibilities of innovations and entrepreneurship as a process;
- To modify the essential characteristics of the indicators for assessment of the purposefulness of business ideas in the context of the targets for sustainable development;
- To revise the criteria for assessment of the degree of satisfaction of consumers' wishes;
- To exert efforts for building up a new system of values in the business which is grounded on social responsibility and the priorities of the long term European and world economic growth;
- To develop methodologies and rules for common coordinated activities of the Member States in order to guarantee maximum compatibility between the common European, national, corporative interests and objectives for achievement of welfare in pan-European plan.

The Treaty establishing the European Coal and Steel Community signed in Paris in 1951 and the Treaty establishing the European Atomic Community - EARATOM mark the beginning of the European energy policy. Since then the focal issues have been revised many times in the context of the structural and political tendencies in the Community. In the developed European energy strategy "Energy 2020 - A strategy for competitive, sustainable and secure energy" the Commission proposes new alternatives for achievement of the targets of the European energy policy. They are consistent with the Lisbon Strategy which paved the way for sustainable development.

The philosophy of the European energy policy and the targets of the European energy strategy define the framework of the political and strategic orientation regarding the energy sector of each Member State of the European Union. The Third Energy Package of the European Commission is consistent with the foreseen tendencies for development of the Community till 2020 (2050) as well as the possibilities to overcome the difficulties upon its growth. Taking into account the significant discrepancies between the countries in economic, technical, resourceful, social and scientific aspect the achievement of the targets is grounded on mutual support and search of alternatives where irrespectively of the differences the policy of equality shall be implemented.

This approach requires that each Member State designs a package of measures for its national energy sector. Its strong and weak points should be carefully analyzed and defined as well as the opportunities and threats for the current and long term development. Aware of the significance of the energetics for achievement of the national and pan-European economic, social and ecological objectives the results of

the analysis of the strategic targets must be subject to wide political and expert debate and on these grounds, coordinated and agreed upon by the public audience, professional and non governmental societies and organizations as well as by each major political force. The achieved succession shall guarantee the strategic stability of the measures and shall allow taking administrative, legal and management actions in the sector for the effective achievement of sustainable development in national and pan-European plan.

To what extent the indicated conditions are implemented in the Republic of Bulgaria? On one hand it can be judged by the contents of the adopted Energy Strategy of Bulgaria 2020 (Promulgated SG, Issue 43 of 7 June 2011) and on the other hand by the attitude of the society, expert community and political parties.

Aware of the current state and perspectives for development of the national energy sector in the context of sustainable development, the acts which formulate and focus on these guidelines must be assessed by the following main criteria:

- Degree of compatibility of the set out strategic targets with the economic and social realities and perspectives in the country and in EU;
- Possibilities for implementation of strategic decisions;
- Succession;
- Instruments for realization of the targets and evolving tasks;
- Protection of national interests;
- Energy balance, energy security and energy independence;
- Interrelation between national, regional and global components of the process;
- Identification of key factors which influence the long term economic, market and technological stability of the economic subjects;
- The role of the scientific potential for successful achievement of the global strategic targets;
- Problems and levels of responsibilities.

The investigation of the pointed out aspects establishes that beside the numerous critical attitudes towards the draft Energy Strategy by 2020, in the period between of its discussion and final adoption the draft has not been modified substantionally as a result of which it may be concluded that in its bigger part the Energy Strategy of Bulgaria 2020 is not approved by a significant number of the parties concerned. The main arguments are conditioned by its peculiarities:

- It does not take into account the weaknesses of the European energy policy which means that the European provisions are taken for granted;
- Lack of common European mechanism for compensation and support of national deficits as a result of deteriorated indicators of energy security and independence;
- The EC program for greenhouse gas emission trading does not account for in full degree the social responsibility of the management of the undertaking and entities;
- The proposed measures for protection of electric power consumers as a result of the policies carried out by the private monopolies, contractual interrelations with the State and the tools of the bodies which have the task to regulate their activities;
- There is available discrepancy in the size of the tendencies of the macroeconomic indicators of the national economy and the plans for energy production on regional scales;
- For stabilization of the energy system and for compensation of the national energy dependence on imported energy carriers we rely on local coals which are characterized by the worst energy and ecological indicators compared to the rest types of coals in the country;
- Lack of clear vision for the practical implementation of the targets relating to achievement of higher energy effectiveness;
- Lack of concrete technical and economic arguments for increase of nuclear powers and sufficient clear vision for the future of the operating at the moment 5$^{th}$ and 6$^{th}$ blocks of the Nuclear Power Plant Kozloduy EAD.

The pointed out circumstances prove the imperfection of the governing policy in the energy sector at national and European level. There might be political favorable attitudes which are difficult to be overcome in favor of national interests. A related argument is the availability of texts in the strategy addressed in 1$^{st}$ person, plural, ("we"), which means that "*priority of the government* is the development and enhancement of the gasification for household needs", "*to create* trust and transparency of the energy market by the end of 2011 *we shall create* electric power stock exchange" etc. Similar approach gives the grounds to consider that these targets have not been commonly adopted but imposed by the governing at the mo-

ment political force and using this approach it strives in public to take responsibility for their achievement. On the other hand the circumstance that the strategy has not been adopted by national consensus gives the grounds to consider that upon potential change of the government for a huge part of the laid down in it targets there will be no political will to be implemented to the end. It is a scenario repetitive from 1990 till now. It is important to mention that the lack of coordination and continuity of the strategic decisions is a pre-requisite for conflicts not only between the political forces but also between generations. This is a problem which is not addressed on purpose but which shall reveal its significance with a greater intensity in the future due to the cultural differences, interests and perceptions. The lack of wide public and political consent with the policies and directions for their achievement may have negative influence also upon the interrelations with the European partners due to the fact that such a phenomenon is accepted as a lack of strategic guarantees for already achieved international agreements and undertaken actions for their realization. In economic aspect the analyzed problem has a negative influence on investment activity.

For prevention and reduction of the influence of the identified problems (typical also for other countries of the Union) it is obligatory for the European Commission at central level to:

- Establish a special unit for planning, coordination and control on activities related to the diversification of energy deliveries;
- Constitute a special fund for financial support of the implementation of those energy targets of the Member States which are linked to the achievement of the main energy targets of the Union;
- Establish a control and analytical body with tasks in the field of implementation of the targets and decisions of the European energy policy.

The non implementation of the pointed out conditions is in fact the main weakness of the energy policy of the Community due to the reason that currently the European Commission has confined solely to the roles of initiator and supervisor regarding the policies and measures for their implementation. At national level the interpretation of the decisions of the Community and the approaches for their achievement are dependent on the psychological characteristics of the people and the degree of the technical and economic development of the nation which the EC is not taking into account to a sufficient extent. On the other hand when a Member State is striving to conquer certain advantages directly related to the improvement of its energy security and dependency, the Commission again applies solely monitoring and in certain cases consultancy functions without making commitments in the respective area. This approach forces the countries to consider the opinion of Brussels. At the same time the countries cannot rely on Brussels when they have to decide on their significant problems. Taking into account the imperative requirement for approval by EC of the national initiatives, the Republic of Bulgaria is striving to satisfy in any way the *principal* requirements of EC in the respective areas. This default is transposed directly in the national energy strategy upon which the administration in its desire to meet the requirements and conditions of the Commission, does not foresee that the national energy strategy should be obligatorily conditioned by the targets and the resources for their achievement. It is the reason that the macro framework is not defined where the targets must be implemented. What would happen in case if it is changed? Most disturbing is the circumstance that the strategy has not been estimated and due to it there is no information on its financial support.

The aforesaid reflects only a part of the problems which should be taken into account in the process of development of plans and programs for implementation of the targets of the Energy Strategy of the Republic of Bulgaria till 2020. In addition, we must consider the fact that the country has one of the worst macroeconomic indicators in comparison with the rest Member States. Nevertheless, in its energy strategy the country determined indicators which are identical with those of the leading countries, within the Community. Bearing in mind these peculiarities it may be concluded that there exists a significant discrepancy between the realistic possibilities and the commitments. Unless instruments and possibilities for the elimination of the discrepancies are found this inconsistency shall compromise the achievement of the main targets of the Energy Strategy 2020:

- Improvement of energy effectiveness at a pace that shall bring it before the average European, i.e. till 2020 the Republic of Bulgaria to achieve two times lower energy intensity of gross domestic consumption;
- Guaranteed implementation of the national target in order to achieve a 16% share of the energy from renewable sources where the total end energy consumption towards 2020 within the country shall be realized above a 16% share of the total end energy consumption;
- Introduction of effective tariff system and methods for regulation of network companies (i.e. private energy monopolies);

- Effective separation of activities relating to delivery and production of electric power from activities relating to management and operation of electric networks etc.

In spite of the defaults the strategy has non controversial positive characteristics, in particular:

- Regulates ambitious targets;
- Entire consistency with the common European energy policy;
- Focuses on the international cooperation for the achievement of national energy security.

To multiply its positive signs it is necessary to correct and rectify the pointed out negatives via guarantee of professional management of the sector at public and business level. As argument can be considered the lack of adopted national strategy for sustainable development (in 2007 was adopted a "Project for sustainable development of the Republic of Bulgaria), lack of strategies for development of separate energy sectors and as a whole lack of vision and strategy for development of the national economy. These circumstances preconditioned non agreed and coordinated decisions justified solely by the eventual approval of the Commission. An example to support the above said is that the abbreviation (similar to the European) of the national energy strategy bears the limitation "2020". It would be more correct to bear the name "National Energy Strategy of the Republic of Bulgaria" where within the contents the relevant strategic periods are defined. In this manner shall be facilitated the processes of its inevitable updating and adapting to the changes of external environment which means that they can much easier and faster and technically be made (where they shall affect solely a single text) than to change its title which in practice means adoption of a new strategy. This approach suggests that the current energy strategy has rather no strategic but medium term characteristics which bear directions defined by the current situation (conjuncture) in the country. The results are indicative for each sector and as a whole for the national energy, in particular:

- Loss of competitive positions on the regional energy market;
- Instead of conservation strategically ungrounded liquidation of coal production powers;
- Premature suspension of operation of the four nuclear reactors of the only nuclear power plant in the country;
- Disturbed interrelations with the traditional partners – suppliers of energy raw materials;
- Lack of clear vision for the place and role of the national energetics in regional and European plan;
- Making decisions and implementation of projects which do not take into account the changes of external environment and leading to multiplication of the influence of the factors conditioning the degree of energy security, energy independence and pro-crisis determinants;
- Lack of strategic documents for development of coal production industry, nuclear energetics and the sector of renewable energy sources;
- Adoption of non implemental decisions;
- Lack of effective control on implementation of the international commitments of the country etc.

Due to the reason that the analyzed approach is not applied only to the energy sector but as a whole to each sector of the national economy currently this results in the reported values of external and internal migration of the population, deserted urbanized territories, high unemployment, lack of traditional and moral values, national traditions and rituals which escalates into negative birth rate and death rate (incl. children), population aging, deterioration of macro- and microeconomic indicators etc.

To summarize afore said it can be concluded that **the search for resolution of current problems must be executed with regard to the assessment of their significance and importance for the future.**

To support the above must be taken into account the results within the framework of the project "Deindustrialization and restructuring of employment: economic and social consequences"[1] implemented in the period 2005 – 2007 by scientists of the University of National and World Economy of Sofia which analyzes the social consequences of the executed structural changes in the industrial regions of Bobovdol and Pernik. The results from the investigation and the studies, as well as the conclusions made under the project by the method of similarity, are valid and may serve as arguments for the current processes in every area of the public and economic life which itself proves in an undisputable way the verification and the significance of the indicated theses within this report.

In the context of the analyzed characteristics and approaches it turns out that the end results for the energy sector since the accession of the Republic of Bulgaria to the European Union have been more negative than positive. For instance with the liquidation of the coal production powers the energy dependence for 2000 – 2010 increased by 9 %, while with the closure of the reactors 1 – 4 in the Nuclear Power Plant of Kozloduy EAD the whole installed production electric powers of the country decreased by 1 760 MW.

[1] With the participation of the author of this report

In the context of the energy policy of the Community and in implementation of the national program for building up replacing powers this default is partly compensated by the placing into operation, in the summer of 2011, of "AES Galabovo" power station (the former "Maritsa East 1" TPP), which meets all the standard requirements for environment protection. Currently the power station operates with powers of 420 MW, whereas it is planned by the end of the year to be increased to 600 MW. It must be pointed out that with the technologies used the $CO_2$ emissions shall be caught at 98-99 %. As a guarantee for the return of investments a contract is concluded with the National Electric Company for purchase of the produced electric power (9% of the total production of electric power in the country) for a 15 year period.

Against the background of nuclear radiation and pollution of large territories all over the world as a result of the breakdowns of the power stations of Fukushima 1 and 2 (as a result of the strongest earthquake in the history of Japan) in global aspect a campaign has been launched against the future development of the nuclear energetics and for undertaking urgent measures for suspension of operation of the existing nuclear reactors.

In reply to the international respond the European Commission undertook measures for revision of its nuclear policy and stress tests of the existing in operation nuclear power stations. Despite the positive results from the tests Angela Merkel, the German Chancellor, announced that by 2022 the German nuclear energetics shall be closed. A similar announcement was made by the Japanese Prime Minister regarding the atomic reactors on the territory of Japan. At the same time against all changes made to the policy of the Community concerning the nuclear energetics the Republic of Bulgaria is making attempts to implement the targets laid down in the energy strategy, i.e. to build up new nuclear powers.

As far as whether the Community policy in the field of nuclear energetics is right and whether the direction for development of nuclear energetics is purposeful may be judged by the fact that Turkey is planning to build up three new atomic power stations one of which shall be nearby the Bulgarian border.

On the other hand in spite of the attitudes towards the future of the nuclear energetics its closure and replacement with alternative energy production powers cannot be realized in short terms. The changes to the policy of the European Commission concerning the role of the nuclear energy must be reflected in its energy strategy where it is said that in 2050 the structure of the total size of the electric power produced in the Community shall be as follows: Atomic Power Station – 28 %; Electric Power Stations – 39 %; Water Power Station – 25 %; Renewable Energy Sources - 8 %.

It is here to underline that the presented scenario has been developed under the condition that in the period 2010 – 2050 the European Commission shall realize an economic growth of 42 %. For the same period it is planned an increase of the share of the nuclear energy in the countries of South Asia and Near East.

For the role of the nuclear energetics it may be decided by the fact that at present in global aspect there are 435 nuclear power stations in service which produce 16 % of the world production of electric power. In the European Union the share of the nuclear energy of the total production of electric power is 31 %, whereas in the framework of the national power production of France it is 79 %, in Germany it is 31 % and in our country it is 45 %.

Taking into account the afore stated and despite the controversial opinions, attitudes and tendencies the expectations and the forecasts are that in the future the role of the nuclear energy shall increase for which the arguments are as follows:

- Non purposefulness of replacement of nuclear powers with power stations burning coals;
- Slow process of design and introduction of the technologies for renewable energy sources;
- Tendencies for fast and significant increase of electric power consumption in the countries of South Asia.

Aware of all stated above it is clear that the decision for the future of the nuclear energy in Bulgaria must account for:

- Forecasts for the economic growth of the country;
- Forecasts for the development of the electric power production in the countries of the Balkan region;
- Forecasts for demand of electric power on regional scales;
- The rules of the European Commission for design and construction of nuclear energy powers;
- Community policy in the area of sustainable development and energetics.

In the context of the entire national energy policy it may be concluded that:

- The Republic of Bulgaria should follow the targets of the EU energy policy in an adaptive way;
- The energy policy is a basic tool for sustainable development on national, European and world scales;

- Having in mind the situation (conjuncture) of the factors of the external and internal environment the Republic of Bulgaria may achieve guarantees for its energy security despite the tendencies for increase of its energy dependence only within the framework of the Community.

In conclusion, taking into account the identified peculiarities of the carried out energy policies in the Community and in Bulgaria, it is necessary that:

1. The sustainable development of the economy in the Republic of Bulgaria is in function of the indicators of energy sectors in regional and global plan;

2. The energy resources, innovations, work culture, social responsibility, political stability and understanding, and entrepreneurship are key factors for the achievement of sustainable development.

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# ENERGY SECURITY AND ENERGY DEPENDANCY OF THE EUROPEAN UNION: THE PROBLEM OF ENERGY SUPPLY

**Svetla Boneva**[1]

**Abstract**

*Energy dependency and security of energy supply represent basic challenges for the European Union (EU) that has a constantly increasing energy dependency. The contemporary priorities and the main priority areas of the EU energy policy have been outlined and discussed in the paper. A short survey of main literature sources in the field of the security of energy supply has been presented. Some of the basic EU actions that have been undertaken at policy level to provide security of the EU energy supply have been outlined as well.*

**Keywords:** energy policy of the EU, security of energy supply

## Introduction

Security of energy supply is one of the basic strategic priorities of the energy policy of the EU. The reason for this is the high energy dependency of the Union (53,9 for the EU-27 and reaching 100% for some member states). Energy dependency is an indicator, showing the extent to which an economy relies upon imports in order to meet its energy needs and is calculated as net imports divided by the sum of gross inland energy consumption plus bunkers (Eurostat, definition accompanying the energy indicators) . Energy dependency is the basic indicator, showing the luck of energy security of a country or region. Energy security on the other hand has economic as well as political implications. In the recent years the EU has undertaken a series of actions aimed enhancing the security of energy supply.

## 1. The EU energy policy: contemporary priorities

Energy is vital for economic development. Ensuring security of energy supply, developing competitive energy markets and meeting the contemporary environmental challenges are the basic strategic priorities of the EU energy policy. In 2007 the EU heads of state reached a historic agreement and laid the foundations of the future common European energy policy (9, 2007). This policy determines the EU vision for the period till 2020 and formulates three fundamental pillars in the energy field:

- **Sustainability,** ensuring that the EU addresses climate change by reducing its emissions to a level that would limit global temperature increases to 2°C above pre-industrial levels. The EU will do this by committing to a 20% reduction in greenhouse gas emissions; a 20% improvement in energy efficiency; and deployment of 20% of energy generation from renewable sources, all by 2020. These are known as the 20:20:20 targets.

- **Security of Supply,** intended to minimise the EU's vulnerability to imports, shortfalls in supply, possible energy crises and uncertainty on future supply. The EU will do this by introducing measures which ensure solidarity between member states, the diversification of supply sources and transportation routes, and improved security of oil stocks, gas supply and electricity generation.

- **Competitiveness,** intended to ensure the effective implementation of the internal energy market. The EU will do this by introducing reforms to ensure clearer separation of gas and electricity transmission from production and supply, thereby creating a more competitive market and by harmonising the competencies of national energy market regulators and ensuring their collaboration.

The EU has set six priority areas within the three basic strategic complementary objectives (17, 2006: p.1):

1. The completion of an open and competitive internal gas and electricity market.
2. The assurance of security of supply within market mechanisms (transparency, competition, liberalisation) and solidarity among Member States in emergency cases.
3. A more sustainable, efficient and diverse energy mix. The choice of energy mix is still a competence of each Member State; however, their choices would affect the whole EU. Therefore, a wide anal-

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yses is proposed to determinate the advantages and disadvantages of each choice from an integrated European vision.

4. An integrated approach to tackling climate change and through it, security of supply and sustainability.
5. A Strategic European energy technology plan.
6. An external energy policy that would enable the EU to speak with one voice.

The achievement of the EU energy policy objectives requires actions in internal and external policies. They have to provide well functioning and transparent markets as well as diversification of energy sources and energy routes. These goals are to be tackled within stable legal conditions for energy investments and trade at EU level and a coherent strategic EU external energy policy where dialogue at multilateral level shall be developed.

## 2. Security of energy supply in the EU: theoretical context and policy development in an European perspective

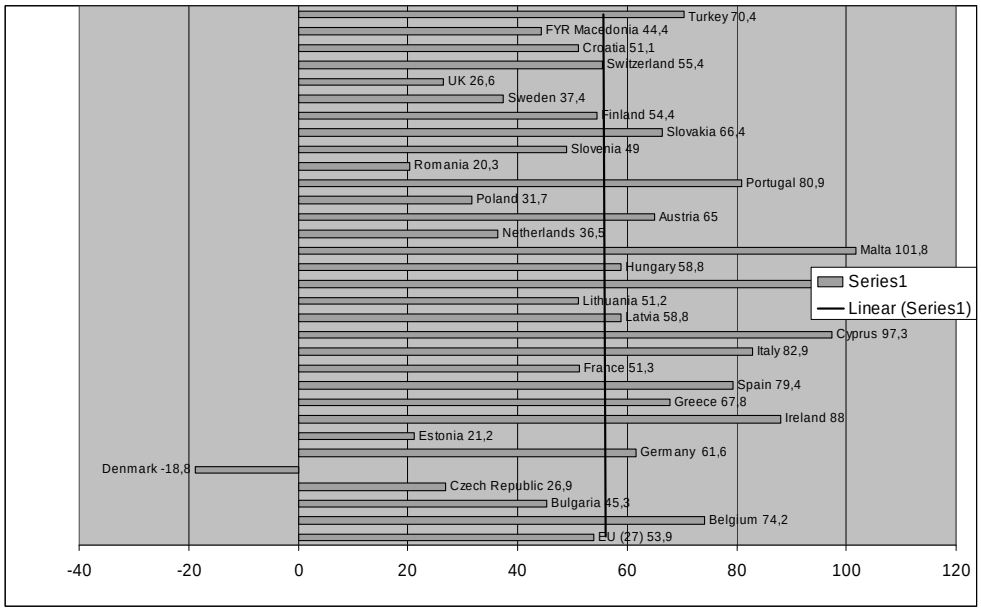
The security of energy supply is traditionally viewed as an element of both energy and security policies. In terms of energy policy, providing security of supply is vital for the functioning of the economy. In terms of foreign and security policy, providing diversity in supply reduces the dependence of the EU on only few energy sources and import destinations and routes thus contributing to the security as well.

The ***security of energy supply*** is an essential element of national security and a factor of economic stability. The EU however is energy dependent on the import of energy sources. The security of energy supply is an important issue for the EU Member States because of the increasing dependence on imported energy sources (mainly fossil fuels) in their energy mix.

The impact of the lack of energy security, is usually classified in the economic literature under the category of economic externalities: the cost of a disruption in supply and of a dramatic price increase – two events that have macroeconomic consequences and are not internalized by consumers and investors in their decisions. The security of energy supply in the energy policy however is defined in qualitative rather than quantitative terms. The EU has not set a global quantitative target for the security of energy supply, as it did for climate change (and for the "sustainable development" pillar of the EU energy policy) with the adoption of the 20-20-20 action plan objective (to which every energy policy document makes reference).

While ***energy dependency*** "shows the extent to which a country relies upon imports in order to meet its energy needs" (Eurostat, 2011; Fig. 1), ***diversification of energy sources*** indicates the diversification of imports with respect to imported energy sources. Diversification of energy sources could be assured through achieving long-term political stability in the energy sources regions of origin and home country (Jansen 2004: p.2). Energy security can be enhanced through: drawing on foreign energy resources by energy treaties and charters and by investment and trade agreements; adequate national/regional strategic reserves to address any interruptions, shortages, or unpredictably high demand; technological and financial resources and know-how to develop indigenous renewable energy resources and domestic power generating facilities; attention to environmental challenges; diversification in import sources and types of fuels; energy conservation and efficiency measures (Khatib, 2001: p.3(113), 20 (130)).

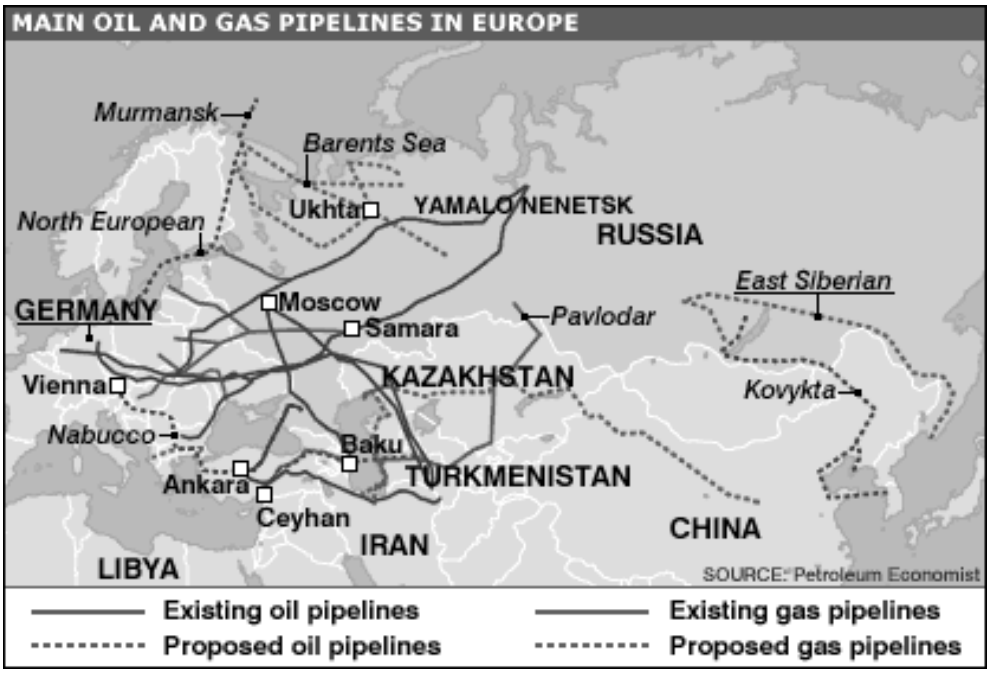
Energy-producing companies, research institutions, and governmental advisors predict that while world energy consumption will increase in the next two decades, the energy production will decrease (European Commission, 2009, EU Energy Trends to 2030 report). Europe is highly dependent on energy imports from other regions (Fig. 2). The EU imports over 50% of its energy. This number is predicted to rise to 70% by 2030 if no measures are taken to change the current European energy policy. 45% of oil imports are coming from the Middle East and 40% of natural gas is acquired from Russia. A successful energy policy for Europe should, therefore, aim to find the right balance between security of supply, consideration for environmental impacts on local and global levels, and competitiveness.




**Note:** Energy dependency shows the extent to which an economy relies upon imports in order to meet its energy needs. The indicator is calculated as net imports divided by the sum of gross inland energy consumption plus bunkers.

**Source:** Eurostat, link to the data table: http://epp.eurostat.ec.europa.eu/tgm/table.do?tab=table&init=1&plugin=1&language=en&pcode=tsdcc310

**Figure 1.** Energy dependence of the EU




**Source:** Petroleum Economist, http://www.petroleum-economist.com/Product/5187/Map-Store/Oil-and-Gas-Map-of-Western-Central-and-Eastern-Europe-2008.html

**Figure 2.** Main oil and gas pipelines in Europe

All EU member states are dependent upon foreign oil and gas, albeit to a different extent. Because of this common need, the EU requires a common energy policy. As a union, the EU possesses an enormous buying power that comes from being the world's second largest consumer of energy and one of the most energy-efficient areas. However, the EU member states have had uncoordinated approach to energy policy

till now. Member states have different levels of energy dependency and the protectionist policies of some of their governments are the reason for this lack of cohesion in the field of energy policy.

Europe possesses limited resources of oil - up to 2000 it has produced around 50 billion barrels of oil. Before extraction, Norway and Great Britain possessed 75% of the continent's total original reserves, most of them located in the North Sea. Besides Norway and the UK, only Denmark has a significant volume of reserves. Rumania, the other bigger producer in Europe, had its highest levels of production in the 1970-s and is now in decline. Europe now needs to import around 60% of its oil needs, mainly from Russia and the Middle East, and it will need to increase imports by around 2% yearly to maintain demand at current levels. Denmark and Great Britain are the major EU energy exporters but the import needs of Germany, France, Italy and Spain seriously prevail.

The EU currently imports 40% of its gas consumption. European gas reserves, located mainly in Great Britain, the Netherlands and Norway, are also diminishing. The percentage of imports, therefore, could rise to 70% by 2020. Russian gas import accounts for 25% of EU gas supplies (Figure 3, Figure 4) and comes mainly from one company (Gazprom) strongly influenced by the Russian government. The Commission's Green Paper on security of energy supply from November 2000 predicted rise in energy dependency of the EU from 50% in 2000 to 70% in 2030. The imports of oil will increase from 45% to 90%. By 2030, over 60% of the EU gas imports are expected to come from Russia (from 40% coming from Russia in 2000, 30% coming from Algeria, and 25% from Norway) with overall dependency expected to reach 80% - a 100% increase from 2000 (Euractiv, 2007: p.1).

Aside from Russia, the Middle East plays a key role in European oil and gas dependency: 63% of the world's oil reserves and 35% of the reserves of gas are concentrated there. Europe imports around 3 million barrels per day from the Persian Gulf, which means 45% of its oil imports. The EU is the main purchaser of oil and the biggest supplier of goods and technologies to Saudi Arabia (38% of its imports come from the EU) and Iran, and the main trading partner to the Persian Gulf countries. It is both Kuwait's and the United Arab Emirates' leading supplier, providing 30 – 40% of their imported goods (Pillard, 2004: p.2).

The picture emerging from the above numbers shows strong dependency of the EU on oil from the Middle East and on gas from Russia. Any debate on the EU energy policy takes this geopolitical dependency situation into consideration.

Given the nature of the EU dependency on foreign energy supply we can draw the conclusion that the EU needs a clearer and more collective policy on security of energy supply. To date, the issue of security of energy supply is only really considered at national member state level, but in reality we need a much greater European-wide approach on this issue.


**Source:** http://www.eia.gov/countries/cab.cfm?fips=RS

**Figure 3.** Primary Russian Oil and Gas Pipelies to the European Union


**Source:** The Economist, http://www.economist.com/node/17260657

**Figure 4.** Basic gas pipeline routes in Europe

## 3. EU actions aimed to provide security of energy supply

For almost 30 years, the EU energy policy has been confined to nuclear energy and coal, as prescribed by the European Coal and Steel Community establishing treaty and the European Atomic Community treaty. All attempts to extend the EU energy policy to the security of energy supplies remained unsuccessful. Moreover, the EU member states could not reach an agreement to include an energy chapter in the Treaties of Maastricht and Amsterdam. Despite the support of the European Commission and the European Parliament, most of the member states are afraid of losing their autonomy over energy policy. The main reasons for their fear have been the different interests of energy producing and non-producing countries, as well as the different structures of national energy sectors. As a result, EU energy policy until recently has largely relied on intergovernmental co-operation, in which each member state exercises veto power.

After the eastern enlargement the EU policy towards Russia has become far more prominent on the EU agenda. Similarly, the potential Turkish membership would result in a EU border with Syria and a stronger EU involvement in the Middle East. It is clear that foreign policy relations with big suppliers will have a major energy component. From EU perspective, energy partnership usually has two strategic dimensions: one is to secure energy imports for the EU through economic and political interdependence; the other is to use the energy sector as the motor for political and economic reform in the countries concerned. Export revenues are expected to increase investment and bring in foreign expertise, thereby further deepening economic interdependence. The typically applied tool by the EU to exert its influence is to enhance economic interdependence (Egenhofer, 2002: p.10-11 (49-50)).

So, it will not be wrong to conclude that the development of the EU energy policy was at the heart of the European project, with the ECSC Treaty (establishing the European Coal and Steel Community) in 1951 and the Euratom Treaty (establishing the European Atomic Energy Community) in 1957. Nevertheless the concept of introducing a mandatory and comprehensive ***EU energy policy*** was approved at the meeting of the European Council on 27 October 2005 in London. The reason for the including of the energy issues in the EU agenda was the fact, that the EU then has imported 82% of its oil and 57% of its gas, making it the world's leading importer of these fuels. Only 3% of the uranium used in European nuclear reactors was mined in Europe. Russia, Canada, Australia, Niger and Kazakhstan were the five largest sup-

pliers of nuclear materials to the EU, supplying more than 75% of the total needs in 2009 (Euratom Supply Agency, 2002).

The principles of the so called “Energy Policy for Europe (EPE)” were elaborated at the Commission's green paper “A European Strategy for Sustainable, Competitive and Secure Energy” on 8 March 2006. Later in March 2006 the EU leaders met in Brussels. This summit had energy issues on the top of its agenda, along with its traditional economic and social agenda. The goal was to develop a new Energy Policy for Europe. Discussions were based on the Commission suggestions presented in a Green Paper published in the beginning of March. EU energy ministers supported the main points of the Green Paper but insisted on preserving national sovereignty on key aspects of energy policy such as the choice of energy mix and rejected the idea of a single European energy regulator. Therefore, the summit was limited to more general principles and already agreed goals of securing energy supply and competitiveness.

Although EU leaders fully realized the need for and the advantage of a common energy policy, they have had a hard time overcoming their national loyalties. France’s President Chirac, whose country has been in “a row with Italy over the blocking of Enel’s takeover bid of the French energy utility Suez,” asserted that the construction of the EU energy policy cannot be confined to the liberalization of markets. Rather, it should aim to develop ‘European champions’ “based on solid industrial ambition and not on a purely financial approach” (Euractiv, 2006).

The EU leaders backed proposals to strengthen energy cooperation and confirmed a strategy aimed primarily at increasing the EU security of energy supply through: increased cooperation on external policy with main supplier countries such as OPEC and Russia, as well as with major transit and consumer countries; diversification of energy sources (both external and indigenous) and transport routes; and a common approach to address crisis situations in a spirit of solidarity. The summit insisted on a balanced approach with the two other policy objectives of ensuring the competitiveness of European economies and securing longer term environmental sustainability.

As a result of the decision to develop a common energy policy, the first proposals of the European Commission, called “Energy for a Changing World” were published after a consultation process, on 10 January 2007. It is claimed that they will lead to a 'post-industrial revolution', or a low-carbon economy, in the EU, as well as increased competition in the energy markets, improved security of supply, and improved employment prospects. Although the proposals have been adopted by the European Commission, they require the approval of the European Parliament but were debated and approved at a meeting of the European Council on 8 and 9 March 2007. Key proposals (European Commission, 2007) include:

- A cut of at least 20% in greenhouse gas emissions from all primary energy sources by 2020 (compared to 1990 levels), while pushing for an international agreement to succeed the Kyoto Protocol aimed at achieving a 30% cut by all developed nations by 2020.
- A cut of up to 50% in carbon emissions from primary energy sources by 2050, compared to 1990 levels.
- A minimum target of 10% for the use of biofuels by 2020 (Stoyanov, 2008).
- Energy supply and generation activities of energy companies should be 'unbundled' from their distribution networks to further increase market competition.
- Improving energy relations with the EU neighbors, including Russia.
- The development of a European Strategic Energy Technology Plan to develop technologies in areas including renewable energy, energy conservation, low-energy buildings, 4th generation nuclear power, clean coal and carbon capture.
- Developing an Africa-Europe Energy partnership, to help Africa 'leap-frog' to low-carbon technologies and to help develop the continent as a sustainable energy supplier.

Underlying many of the proposals are to designed to limit global temperature changes to no more than 2 °C above pre-industrial levels, of which 0.8 °C has already taken place and another 0.5–0.7 °C is already committed (Geden, 2010). 2 °C is usually seen as the upper temperature limit to avoid 'dangerous global warming' (Randalls, 2010). To achieve these objectives, the EU has undertaken a series of initiatives to reduce the energy intensity of the economy. If the indicator showing the Energy intensity of the economy is used as a benchmark, most of the EU member states have worse score than Japan, USA and Switzerland, and a still large number of EU member states have worse indicators than some countries that are candidates for EU membership, like Croatia and Turkey. So, the reduction of energy intensity of the economy could be viewed as an important contributor for the enhancement of the energy security of the EU and for the reduction of the energy dependency of the Union.

**Table 1.** Energy intensity of the Economy of the EU member states and some other selected countries

| GEO/TIME | 1998 | 2000 | 2002 | 2004 | 2006 | 2008 | 2009 |
|---|---|---|---|---|---|---|---|
| EU27 | 200,22 | 187,29 | 184,88 | 184,06 | 175,50 | 167,40 | 165,20 |
| Euro Area | 191,72 | 182,54 | 177,97 | 179,40 | 171,29 | 163,68 | 161,16 |
| BE | 249,07 | 234,77 | 218,85 | 220,68 | 208,38 | 204,82 | 205,69 |
| BG | 1 589,17 | 1 332,85 | 1 247,74 | 1 105,14 | 1 057,63 | 910,39 | 842,54 |
| CZ | 715,24 | 671,06 | 665,80 | 658,69 | 587,05 | 525,58 | 514,09 |
| DK | 129,04 | 114,03 | 113,66 | 112,34 | 110,65 | 104,80 | 106,70 |
| DE | 178,06 | 166,60 | 165,43 | 166,04 | 158,86 | 150,57 | 150,55 |
| EE | 953,91 | 805,99 | 698,35 | 685,76 | 543,73 | 579,73 | 607,04 |
| IE | 151,70 | 135,41 | 128,85 | 117,84 | 107,40 | 108,08 | 109,39 |
| GR | 210,01 | 204,92 | 198,78 | 187,44 | 178,53 | 170,97 | 167,88 |
| ES | 196,25 | 196,69 | 195,07 | 197,94 | 187,81 | 176,59 | 168,14 |
| FR | 190,01 | 178,88 | 179,83 | 179,43 | 171,00 | 167,05 | 164,33 |
| IT | 150,16 | 147,60 | 145,08 | 149,70 | 146,65 | 142,12 | 140,12 |
| CY | 242,91 | 237,44 | 227,72 | 218,42 | 212,65 | 214,53 | 211,54 |
| LV | 563,48 | 440,46 | 412,48 | 386,46 | 327,21 | 308,62 | 354,49 |
| LT | 768,14 | 576,34 | 617,31 | 551,69 | 436,95 | 418,49 | 445,92 |
| LU | 174,56 | 162,99 | 169,74 | 187,49 | 170,95 | 155,09 | 151,93 |
| HU | 554,86 | 492,21 | 466,87 | 434,08 | 425,73 | 408,61 | 413,48 |
| MT | 243,15 | 189,24 | 192,98 | 214,56 | 195,32 | 187,76 | 168,29 |
| NL | 196,13 | 183,20 | 185,35 | 189,02 | 173,82 | 171,60 | 173,83 |
| AT | 151,77 | 140,67 | 146,43 | 151,19 | 147,79 | 138,56 | 136,24 |
| PL | 563,31 | 483,64 | 468,67 | 440,71 | 425,38 | 384,01 | 363,72 |
| PT | 198,37 | 197,68 | 201,78 | 203,47 | 191,56 | 183,58 | 186,50 |
| RO | 1 037,95 | 906,05 | 857,74 | 766,70 | 704,78 | 612,76 | 576,90 |
| SI | 330,81 | 299,77 | 298,51 | 290,19 | 269,65 | 257,31 | 252,28 |
| SK | 814,51 | 815,40 | 795,12 | 708,24 | 622,67 | 517,89 | 496,57 |
| FI | 276,09 | 248,49 | 256,50 | 257,49 | 241,55 | 216,52 | 221,97 |
| SE | 208,32 | 177,67 | 185,75 | 177,70 | 157,92 | 152,36 | 147,88 |
| UK | 153,46 | 144,63 | 135,43 | 130,78 | 123,54 | 114,73 | 113,71 |
| IS | 310,04 | 343,37 | 345,55 | 322,63 | 357,71 | : | : |
| NO | 147,40 | 142,77 | 134,05 | 135,54 | 133,05 | 140,64 | 135,79 |
| CH | 103,05 | 97,58 | 98,38 | 96,32 | 94,16 | 88,76 | 90,94 |
| HR | 357,50 | 336,46 | 326,79 | 319,46 | 295,22 | 279,46 | 284,28 |
| MK | 811,25 | 690,54 | 679,36 | 685,62 | 670,92 | 594,80 | 553,80 |
| TR | 258,10 | 264,62 | 259,06 | 245,25 | 243,84 | 246,26 | 257,40 |
| US | 219,91 | 212,78 | 205,41 | 197,87 | 186,26 | 180,60 | 177,4600000 |
| JP | 103,58 | 103,90 | 101,86 | 100,05 | 95,62 | 90,10 | 91,74000000 |

**Source:** Eurostat, http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=nrg_ind_332a&lang=en

Originally, the debated and approved proposals at the meeting of the European Council on 8 and 9 March 2007 included a 20% cut in carbon emissions. On 14 February 2007, the European Parliament adopted a non-binding resolution demanding the key proposal to cut carbon emissions by 20% to be increased to 25% (European Parliament, 2007).

The Energy Package presented by the European Commission on 10 January 2007 is part of the movement begun by the Green Paper on a European Strategy for Sustainable, Competitive and Secure Energy in March 2006 and once again places energy at the heart of European activities. Based on the Energy

Package, the Heads of State and Government at the spring European Council on 9 March 2007 adopted a comprehensive energy Action Plan for the period 2007-2009 (European Council, 2007).

## Conclusion

The EU is energy dependent on the import of energy sources. The security of energy supply is an important issue for the EU Member States because of the increasing dependence on imported energy sources (mainly fossil fuels) in their energy mix.

To reach the EU energy policy objectives we need actions in internal and external policies. They have to provide well functioning and transparent markets as well as diversification of energy sources and energy routes. This has to be done through stable legal conditions for energy investments and trade at EU level and a coherent strategic EU external energy policy where dialogue at multilateral level shall be developed.

Given the nature of the EU dependency on foreign energy supply we can draw the conclusion that the EU needs a clearer and more collective policy on security of energy supply. To date, the issue of security of energy supply is only really considered at national member state level, but in reality we need a much greater European-wide approach on this issue. The European energy policy is a currently developing EU policy. This article presents research till July 2011.

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# LESSONS FROM WORLD ECONOMIC CRISES: CLEANING, REMODELING AND HARMONIZING THE ECONOMY

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**Abstract**

*Every bigger economic crisis, as the current one, leaves behind a huge material damage to the world economy, and to separate national economies as well. However, every such crises reminds national authorities of the mistakes done in the past while creating and running macroeconomic policy and teaches them how they should overcome them in the upcoming period. That is the positive part of the crises: it should be understood as a good teacher who gives lessons based on which an ambient for a lasting and sustainable growth in future should be created.*

*From the current economic crises we've learned that it worked as a purgatory: the weak and fragile companies fell down; the more resistant ones took the chance and became even stronger; new companies emerged which create optimism and faith in an upcoming sustainable course towards the expansive path of the economic cycle.*

*The crisis reshapes the world economic map. Market forces are not in the same geographical borders as before. Spheres of interest are not the same as before. Competition on world markets gets new forms and players. The authorities of most of the countries became aware that they should remodel the domestic economy, if they wanted a better position in the incoming distribution of world markets.*

*Finally, the crisis showed that a stabile economic growth may not be expected in future, either locally or globally, without appropriate harmonization of the basic instruments of macroeconomic policy: fiscal policy, monetary policy and foreign trade policy.*

*Has Republic of Macedonia learned those lessons? How can its economy shift into a lasting and sustainable economic growth in the upcoming period? The simple and, at the same time, very complex answer would be: by remodeling its economy!*

**Key words**: crisis; lessons; growth; remodeling; harmonization.

**J.E.L. classification code:** E6 - Macroeconomic Policy, Macroeconomic Aspects of Public Finance, and General Outlook

## Introduction

The focus of this research will be on the response to the global economic crisis by selected South Eastern Europe countries such as: Albania, Bosnia, Macedonia, Serbia, Slovenia, Croatia, Bulgaria and Montenegro. Since these countries are considered as transition, mainly small and highly open economies, their economic growth model prior 2008, seemed manageable and sustainable. The formula they pursued for achieving higher economic growth was clear: increasing export, investing heavily into real estate and infrastructure plus implementing structural reforms in addition to promoting the countries as attractive foreign investment destinations, which should ultimately lead to a higher economic growth. But, these countries appeared ex ante more vulnerable when taking into consideration their reliance on foreign demand and capital inflows prior and during 2008, which were used to finance their growth. As global liquidity springs 'dried out', the SEE region's growth model appeared dramatically challenged, triggering fears that the shortage of external capital inflows could generate some severe macroeconomic adjustment and jeopardize macroeconomic and financial stability. To a great extent, this poses question on whether these countries should continue to rely mostly on external demand and foreign capital, or a new approach is needed in order to finance their economic growth in future. The main finding of this research is that instead of experiencing external 'push' factors for economic growth by the Governments, a promotion of internal resources is needed in order to enable for "the catching up" process of these countries to continue.

The position assumed for this research is interpretative using qualitative methods of research. In order to ensure comparability among results, the proposed methodological design will be multiple-case study

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research on the selected SEE economies. Due to the personal interest of the author of this text, the case of Macedonian economy will be thoroughly analyzed. While doing so, following questions will be raised: Has Republic of Macedonia learned those lessons and how can its economy shift into a lasting and sustainable economic growth in the upcoming period? The answer of those questions will be the same again: Macedonia will have to remodel its economy.

## I. THE POSITIVE SIDE OF THE WORLD ECONOMIC CRISIS

Usually, economic crises are valued as a negative economic form. Such is the case with the actual world economic crises. While evaluating it, analyses are being done on how big might be the final losses and how big might be their consequences for the upcoming developing trend of the world economy. While doing so, it is rarely estimated that the crises has some positive characteristics. They may be located in several fields.

**a) Cleaning the economy: Economic Crisis as a purgatory**

It is understandable that the number of newly opened companies continually increases. Economic subjects try to realize their innovative qualities by modifying to business climate. Some succeed to better establish themselves in the national and world economy. However, others cannot make a qualitative and lasting business even in the best economic conditions, thus breaking the more intensive economic development. In the times of economic crisis, their weakness is even more emphasized, which is why they have to give up the place for economic competition to the stronger and more qualitative economic subjects.

Thus, we can say that economic crisis acted as purgatory (14, 2011, p. 2): weak firms failed, strong firms remained and strengthened, and new, brave actors have appeared on the economic scene. It indicates the existence of latent powers and possibilities of the economy that should be used in the upcoming period for taking national economies to a more prosperous path of their post crisis development.

**b) Crisis as a teacher**

The appearance and presence of economic crisis in any material or geographic range shows the weaknesses that are present in the economy and shows the carriers of economic policy which are the basic lessons that have to be learnt from economic crisis and to be taken into consideration in the creation of economic policy in the post crisis period. Whereupon, the economic crisis should be treated as any well-intentioned teacher, because it (1) shows us what are the main weaknesses of the existing economic growth model and (2) how we should create an ambient for a lasting and sustainable growth in the future.

Further analyses in this work will show that creators of economic policy in analyzed countries should seriously analyze and apply the lessons learnt from the world economic crisis.

## II. MAIN CHARACTERISTICS OF PRE CRISIS ECONOMIC GROWTH MODEL OF SELECTED SEE ECONOMIES

### 1. Strong economic growth

In the years that marked the shock which the economies of the analyzed countries were exposed to, after the breakdown of the previous socio-political system, they recorded negative or modest growth level. After that shock and especially after establishing institutional bases for a functional market economy which is a prerequisite for their future development and integration in EU market, economies of those countries started recording high levels of growth (see table 1).

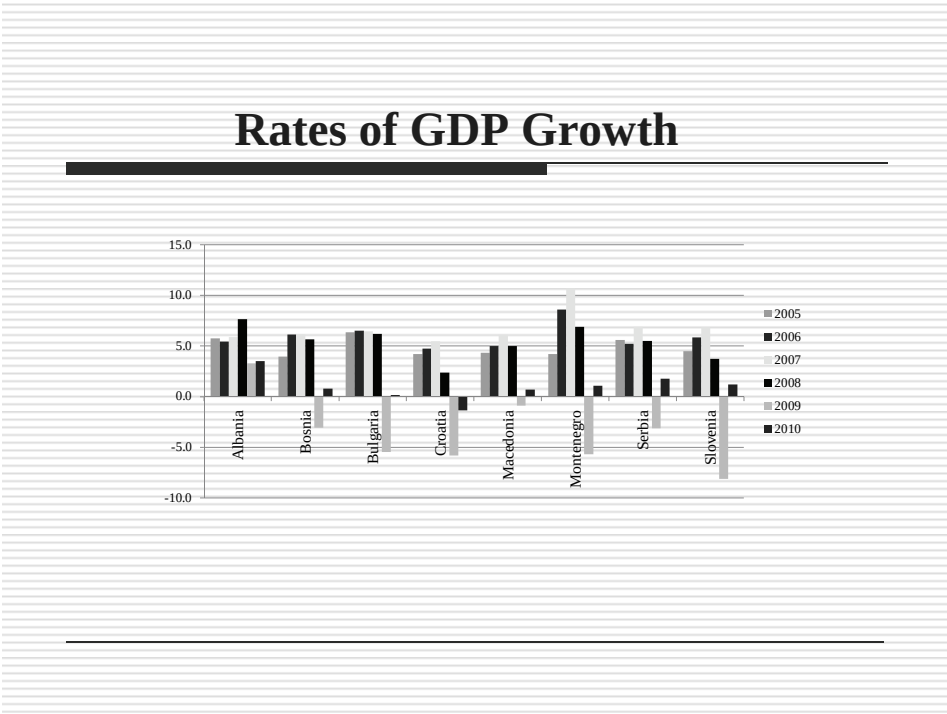
In the years before the begging of the crisis (2005-2008) the economies of all analyzed countries recorded especially high growth development. Average annual growth of those economies was 5.7%. That is a higher growth rate compared to averagely realized growth of other emerging market regions, and also to the average growth rate of the economy of other EU member states.

**Table 1**
**Rates of GDP Growth**

| Country/Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| **Albania** | 5.8 | 5.4 | 5.9 | 7.7 | **3.3** | 3.5 |
| **Bosnia** | 4.0 | 6.1 | 6.1 | 5.7 | **-3.1** | 0.8 |
| **Bulgaria** | 6.4 | 6.5 | 6.4 | 6.2 | **-5.5** | 0.2 |
| **Croatia** | 4.2 | 4.7 | 5.5 | 2.4 | **-5.8** | -1.4 |
| **Macedonia** | 4.4 | 5.0 | 6.1 | 5.0 | -0.9 | 0.7 |
| **Montenegro** | 4.2 | 8.6 | 10.7 | 6.9 | **-5.7** | 1.1 |
| **Serbia** | 5.6 | 5.2 | 6.9 | 5.5 | **-3.1** | 1.8 |
| **Slovenia** | 4.5 | 5.9 | 6.9 | 3.7 | **-8.1** | 1.2 |

Source: IMF, World Economic Outlook Database, April 2011

It may be also be said that there were significant growth differences between individual countries which is a result of the chosen model of economic development and the positioning of certain economies in regional and world economy (see graph 1).




**Source:** IMF, World Economic Outlook Database, April 2011.

**Figure 1**

The trend of intensive economic growth in all analyzed countries was broken in 2009. Then all analyzed countries recorded negative growth rates, except Albania, where due to previously started intensive investment activities supported by a large inflow of direct foreign investments, the economy recorded a noticeable economic growth in 2009 and 2010.

Decrease of economy had a diverse intensity in different countries. The biggest fall was recorded in Slovenia, Croatia, Montenegro and Bulgaria, and the smallest in Macedonia.

Thus, the growth trend was broken in (2009) the time when almost all world economy entered in the zone of recession. That is a logical reason for such happenings. However, during that year, the main weaknesses on which previous model of economic growth of almost all analyzed countries was based, were recorded.

## 2. Basis for economic growth

What is the intensive economic growth of most countries before the beginning of economic crisis due to?

To a significant degree, external drivers accounted for this (1, 2011, p. 2). High growth was made possible with a distinctive growth model based on large capital flows (10, 2011, p. 8), which mainly came through foreign direct investment, credit inflows and private transfers.

### a. Foreign direct investment

In the pre-crisis period, all analyzed countries had recorded a high inflow of foreign direct investment (FDI's). That is logical, having in mind that all those countries were determined to become EU members, that's to say economic integration into EU. One of the conditions for fulfilling that aim is liberalization of capital inflows in the country from abroad, and especially from EU member states. Their determination to enter EU and NATO made them attractive for foreign investors who had decided to invest great amount of money and thus became one of the main promoters of economic growth of those countries. At the same time, depending on the size of the country, its business climate, its position towards the EU integration, the openness towards foreign countries, its infrastructure, monetary and fiscal freedom, protection of author's rights and so on, the amounts of FDI's differed greatly from country to country. Understandably (due to its joining to EU and NATO in the meantime) the highest absolute inflow of FDI's was recorded in Bulgaria, and afterwards Croatia which is the closest to joining EU (see table 2.)

**Table 2**

**Foreign Direct Investments (USA $)**

| Country/Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| Albania | 264 | 325 | 662 | 988 | **979** | 1,205 |
| Bosnia | 613 | 766 | 2,077 | 1,064 | **501** | 68 |
| Bulgaria | 3,916 | 7,804 | 12,388 | 9,795 | **4,467** | 2,388 |
| Croatia | 1,825 | 3,468 | 5,023 | 6,140 | **2,605** | 641 |
| Slovenia | 577 | 648 | 1,514 | 1,924 | **(67)** | 897 |
| Macedonia | 97 | 424 | 699 | 587 | **248** | 296 |
| Montenegro* | _ | _ | 450 | 916 | **1,311** | 387 |
| Serbia | 1,441 | 4,286 | 2,004 | 2,995 | **1,920** | 1,157 |

Source: UNCTADstat

However, in 2009 a sudden decrease of FDI's inflow occurred at most of these countries. Thus dropped one of the most important sources of financing the growth on which was based the economic model of those countries in that time. The rapid decline of FDI's inflow may be determined as one of the more significant reasons for economic fall in those countries in 2009 and in Croatia in 2010 as well. This finding doesn't count for Albania where FDI's reached high amounts in 2009, which was one of the main reasons that Albania accomplished high rate of economic growth (3.3. to 3.5%) in 2009 and 2010 respectfully.

**b. Credit inflows**

The lack of domestic financial capital for financing the projected economic growth more of the analyzed countries compensated by borrowing funds from abroad on credit basis. Credits were largely intermediated by subsidiaries of Western Europe banks in those countries due to (10, 2011, p. 9):

- Macroeconomic stability and structural reforms in selected countries;
- Reduced country risk;
- EU membership of some of the selected countries and prospects for EU membership of the other selected countries.

Besides that, the credit interest rates in euro-zone were lower than those in the analyzed countries. As the same time, their reduced country risk has resulted in an improved access to capital markets at very low prices.

Those reasons conditioned the indebtedness of certain countries to grow from year to year (see table 3). With exemption of Bulgaria, the level of their gross indebtedness in 2009 and 2010 was remarkably higher than the one recorded in the previous two-three years, which is understandable having in mind the decreased inflow of FDI's in most of them during those two years.

Table 3

**General Government Gross Debt (% of GDP)**

| Country /Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| **Albania** | 58.2 | 56.7 | 53.8 | 55.2 | **60.2** | 59.7 |
| **Bosnia** | 25.3 | 21.8 | 32.9 | 30.9 | **35.4** | 36.9 |
| **Bulgaria** | 29.4 | 23.4 | 18.6 | 15.5 | **15.6** | 18.0 |
| **Croatia** | 38.4 | 35.8 | 33.2 | 29.3 | **35.4** | 40.0 |
| **Macedonia** | 39.5 | 32.0 | 24.0 | 20.6 | **23.9** | 24.8 |
| **Montenegro** | 38.6 | 32.6 | 27.5 | 31.9 | **40.7** | 44.1 |
| **Serbia** | 56.3 | 43.0 | 35.2 | 33.4 | **36.8** | 44.0 |
| **Slovenia** | 27.0 | 26.7 | 23.4 | 22.5 | **35.4** | 37.2 |

Source: IMF, World Economic Outlook Database, April 2011

According to this, the development in those countries leaned on foreign credits. However, as a result of the emergent situation under the influence of the economic crisis, country risk of all countries in the region increased, and thereby the interest rates of foreign credits. That caused almost external imbalances at most of the selected countries and big vulnerability because of high proportion of foreign denominated debt.

At the same time, in the countries (Serbia) with a fluctuating course of national currency, the value of debt towards foreign countries calculated in domestic currency increased in circumstances when economy recorded low or negative growth rates, when profits of companies-debtors decreased, and wages of citizen-debtors remained the same or were reduced.

Thereby, the possibilities for new indebtedness abroad suddenly lowered down and worsened. It appeared that their future economic development could not lean on foreign credits as earlier.

**c. Private transfers**

The third most important financial source of economic growth of selected countries were private transfers from abroad, especially worker's remittances. It is noticeable (see table 4) that in all selected countries (with exemption of Montenegro, which has a small number of citizen that work abroad) private transfers recorded high amounts and dynamics of growth during the pre-crisis period.

Table 4

**Private Transfers** (in EUR million)

| Country/YEAR | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| **Albania** | 897 | 1,011 | 1,043 | 937 | 938 | 922 |
| **Bosnia** | 613 | 1,772 | 1,972 | 1,926 | 1,650 | 1,700 |
| **Bulgaria** | 818 | 670 | 681 | 861 | 956 | 1,547 |
| **Croatia** | 1,184 | 1,107 | 1,043 | 1,070 | 1,036 | 1,104 |
| **Slovenia** | 97 | 173 | 239 | 302 | 159 | 104 |
| **Macedonia** | 853 | 982 | 1,012 | 985 | 1,132 | 1,366 |
| **Montenegro*** | _ | _ | 59 | 73 | 85 | 114 |
| **Serbia** | _ | _ | 2,876 | 2,554 | 3,518 | 3,356 |

Source: National Banks

More importantly, those transfers were not only reduced but also increased in times when economic crisis reached its peak. That may be evaluated as illogical bearing in mind that due to economic crisis great number of workers abroad were fired or their wages were reduced. An objective explanation of that occurrence is the fact that part of those workers that were temporally fired returned back at their native countries and stayed there longer than their usual annual holidays. That was a reason for their bigger expenditure (transfer) of savings in their native country.

However, private transfers played a serious role in financing growth activities of selected countries in 2009 and 2010. On the contrary, those countries would have certainly recorded worse economic results than the ones realized. Private transfers played a serious role of amortizing external imbalances in most of those countries for achieving a remarkably lower rates of current account deficit (see table 5). That however showed the great dependence, uncertainty and high sensibility of those countries to the amount and dynamics of capital inflow of private transfers that should be taken into consideration while creating the future model of their economic development.

Table 5

**Current account imbalances**

**Current account balance (percent of GDP)**

| Country/Year | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| **Albania** | -6.1 | -5.6 | -10.4 | -15.2 | -14.0 | -10.1 |
| **Bosnia** | -17.2 | -8.0 | -10.7 | -14.5 | -6.9 | -6.0 |
| **Bulgaria** | -11.7 | -17.6 | -30.2 | -23.3 | -10.0 | -0.8 |
| **Croatia** | -5.5 | -7.0 | -7.6 | -9.2 | -5.5 | -1.9 |
| **Macedonia** | -2.6 | -0.8 | -6.5 | -13.9 | -6.4 | -2.8 |
| **Montenegro** | -8.5 | -24.1 | -39.5 | -50.6 | -30.3 | -25.6 |
| **Serbia** | -8.7 | -10.2 | -16.0 | -21.1 | -6.9 | -7.1 |
| **Slovenia** | -1.7 | -2.5 | -4.8 | -6.7 | -1.5 | -1.2 |

Source: IMF, World Economic Outlook Database, April 2011

### 3. General conclusion: Countries with high external vulnerabilities

The previous analysis showed the ways in which the pattern of growth in most of selected countries was unbalanced, allowing significant external and financial vulnerabilities to emerge. Capital inflows did not sufficiently feed into productive investment, and the competitiveness of economies was not upgraded to assure sustainable growth. There was an over-reliance on foreign savings to sustain consumption and residential investment (1, 2011, p. 5). It become obvious that yesterday's import-led, financial sector driven and debt fuelled transition trajectory of economic development in the region must be subject to a root and branch re-evaluation (3, 2011, p. 90).

Financial integration, including the prominent role of foreign-owned banks, was a crucial part of transition strategy of those countries. However, the associated high investment levels during times of growth did not help much to improve the competitiveness of the countries. Productive investment did not flow in those countries. Domestic reforms lagged in key areas for the business environment and for a healthy growth of the traded goods sector (1, 2011, p. 4). Indicators show that there was a big lagging performance in reforming the enterprise sector and in creating competitive domestic market conditions.

In general, the previous model of growth in those countries has shown significant domestic and external vulnerabilities (10, 2011, p. 18). Most of those countries became exposed to international capital flows, the channel through which the financial and economic crisis was transmitted to them. In new created economic world that convergence strategy seems not to be sustainable any more. It becomes obvious that new model for economic growth is needed.

## III. A NEED FOR REMODELING THE ECONOMY – INCREASING THE RESISTANCE TO EXTERNAL SHOCKS

There is no doubt that the crisis has challenged the regional growth model, which relied on foreign financing of high levels of investment. But, previously mentioned policy and market weaknesses in the pre-crisis period now need to be addressed.

It becomes obviously that there is a need for shifting the pattern of growth towards one that is more labor intensive, more competitive in terms of productivity growth, and less dependent on foreign savings. It is also clear that the previous model, relying on massive capital inflows, will not return in the short run, and probably not even in the medium or long term (16, 2011, p. 34). Having all that in mind we come to conclusion that selected countries, as well as many of others Central and East Europe countries need new economic model that will increase their resistance to external shocks.

In general, there are three broad areas where attention should be pointed out: changing the drivers of growth and its sources of financing; achieving greater risk mitigation through macroeconomic and financial policies; and exploring more effective cross-border linkages as a key dimension of a more prosperous future for the region (1, 2011, p. 6). In other words, there is a need these countries to promote internal resources as "push" factors:

### 1. Increase and reliance on domestic (national) savings

As the pre-crisis growth model of relying heavily on massive capital inflows has proven to be unsustainable for selected countries (10, 2011, p. 29), they will have to figure out ways to develop local sources of finance (16, 2011, p. 34). That means national policy to be more directed towards increasing private and public savings. On one hand an improved business environment should increase potential returns and thus private savings ratio and it will stimulate the shift of investment towards tradable sector and export. On the other hand, a comprehensive fiscal consolidation will correct previously significantly deteriorated fiscal position and will increased the public savings. All of this will decrease the dependence of those countries from foreign savings and will gradually reduce their external imbalances.

### 2. Deleveraging the economy

Increase domestic savings will cause selected countries to decrease their indebtedness at home and abroad. Consolidated fiscal policy, the expected increase of export of goods and services and decreased (limited) import of certain goods and services, due to their production by domestic companies, will diminish the need of the countries for further indebtedness on domestic and foreign markets. At the same time this will create conditions for the countries to more intensively decrease their continual indebtedness which will release them from their interest burden and will increase their rating on international markets.

At the same time, the increase of savings will release private sector from long-term problems of insufficient liquidity and dependability on domestic and foreign credit institutions. The achieved excess of funds they may use for a gradual decrease of their debt towards their creditors. Of course, that should be done cautiously, because deleveraging of the household sector dampens consumption, while corporate deleveraging reduces investment and potential GDP.

At any case, gradual deleveraging will condition reducing the gross indebtedness of the countries and especially their public debt as a sign for the level of creditability of a certain country in the international context.

**3. Greater reliance on domestic credit funding**

According to that, national policies in selected countries should have to stimulate greater reliance on domestic sources of credit funding. Banks in most of those countries will need to rebalance their business, with lending growth linked to deposit growth. National policies should have to discourage excessive leveraging what would contribute to mitigation of external vulnerabilities and make domestic financial system more resistant to external shocks (10, 2011, p. 31).

**4. Diversification and increase of home produced goods and services**

Adjustments in external imbalances should have to be associated with deeper structural reforms in labor and product markets. Such reforms are essential to increase the capacity of those economies to compete with other emerging markets. Policies (17, 2011, p. 50) must be tailored toward competitiveness in the markets most likely to hold growth prospects in those countries. There is a need for structural reform for faster productivity growth. One priority is to integrate further in supply chains feeding demand in Western Europe and generally increasing penetration of Western European markets. But, as a safety valve, Schadler (2011) urges the need for a broadening of export bases in terms of products and markets outside EU.

The economies of analyzed countries can shift their pattern of growth to a more sustainable and balanced one if they sharply address business environment which can help promote the traded good sector.

**5. Channeling foreign capital inflows in export sector**

The crisis has certainly highlighted the problems of export concentration and its potential to derail growth (17, 2011, p. 50).

If some of the analyzed countries are to continue to depend on large inflows from abroad, those inflows must be channeled mostly into export sector.

That may be effectively done by fiscal encouragements of foreign direct investments which production will be directed for export. For example, by giving beneficiaries for paying lower purchase prices for building land, lower communal taxes, giving so called investment premium, temporally exemption of personal income tax, profit tax, social taxes etc.

**6. Harmonization (adjustments) in macroeconomic and financial policy**

Because of their close interdependence, it will be necessary in the upcoming period to harmonize the relations between the most important parts of macroeconomic policy (12, 2010, p. 29) in the direction of their coordinated action. That will eliminate the possibility of destabilizing the economy and create conditions for starting a process of lasting and sustainable (at least at medium term) economic growth of the country. While creating the new model of economic growth the selected countries should insist on harmonizing the measures of fiscal to the measures of monetary policy. It is especially important these two policies to be more proactive in managing capital inflows and particularly in their stimulating to be channeled into tradable sector and export.

Since monetary policy in most cases is given, the fiscal and supervisory policies should be seen as the main bulwarks containing overall levels of risk in the economy (1, 2011, p. 9). Realigning to fiscal-monetary policy mix to focus strategies for existing crisis-induced easing will require early and decisive fiscal tightening so that interest rates can remain low. If fiscal policy is not more credible over the medium term, this could jeopardize growth prospects and increase volatility in money market.

Fiscal adjustment would be best supported by having a public debate on a viable fiscal rule, establishing such a rule, and then sticking to it (17, 2011, p. 50). Besides, a credible, multi-year planning of fiscal policy and fiscal discipline is needed (16, 2011, p. 34).

### 7. Cross-border linkages and regional cooperation

To achieve pattern of growth towards productive investment and export require a deepening of cross-border linkages, and would benefit hugely from the development of a more integrated regional market (8, 2011, p. 69). It is particularly important regional cooperation among the private sector to be improved. There are signs of direct investment growing across borders – for example, from Serbia to Slovenia, Croatia to Serbia and Slovenia etc. But they are only emergent trends. Parallels can be drawn with the scope to achieve much stronger and more efficient networks in the region in the fields of energy, transportation or institutions, for example. Of course, there are lot of other areas – usage of IPA funds, for example, in which exchanges of experiences and cross-border initiatives in the selected countries could be explored.

## IV. REPUBLIC OF MACEDONIA AND THE WORLD ECONOMIC CRISIS

### 1. Effects of the Global Economic Crisis

Republic of Macedonia (RM) has an underdeveloped and shallow financial system which is dominated by commercial banks. It is practically non-integrated into the global financial markets. That weakness proved to be an advantage for the Macedonian economy. Finance developments in the world have not spilled over the banking system in Macedonia. It remained stable, well capitalized and with a small amount of so-called bad loans (non-performing loans). This means that the financial crisis passed RM.

However, the great openness of the economy towards foreign countries meant recession spillover of the crisis in Macedonia (15, 2011, p. 3). That was especially felt when its most important foreign trade partners (Germany, Greece, Italy, Bulgaria, Serbia, etc.) entered the recession. The beginnings of the recession of the economy can be seen at the end of 2008. RM, officially entered the recession in January 2009. After two consecutive quarters in 2009 in which the economy experienced negative trends, in the third and fourth quarter of 2009 it recorded positive growth rates, which interrupted the recession of its economic cycle. In the bigger part of 2010 the Macedonian economy experienced a modest positive change, which caused modest, but positive economic result of 0.7 percent at the end of the year.

The rule (11, 2010, p. 97) according to which recession is followed by social crisis is confirmed in the case of RM. More intensive penetration of the economy in recession in mid-spring 2009 and its peak in midsummer of the same year resulted in intensified increase in the number of effectively unemployed individuals. That trend continued until the end of 2009 and during the first few months of 2010. However, as a result of four packages of anti-crisis measures previously brought by the Government, the number of unemployed did not increase at a pace witnessed in most European countries.

### 2. Lessons for Macedonian economy from the economic crisis

Macedonia's entering the crisis and its gradual coming out of the crisis provoke a few deductions (14, 2011, p. 3) which the authorities need to take into consideration in the upcoming creation of the economic scene in Macedonia:

a. The Macedonian economy is dependent on the performance of several countries (Germany, Serbia, Greece, Bulgaria, Italy…);

b. The Macedonian economy is dependent on the performance of only few sectors: metal industry, textile industry, parts of agriculture, etc. This fact proved to be a widely restrictive factor for the future development of the economy;

c. The Macedonian economy is heavily dependent on the movement of prices of its most important export and import products. The increase of the prices of the metals on the world stock markets at the beginning of 2010 extremely positively influenced the economic development of the major part of the economy in the second and third quarter of the year. On the other hand, the increase of the prices of the fuels and the agricultural and food products, which are basic for the Macedonian economy, triggers rising of the input expenditures, which in turn decreases their competitiveness on the world markets;

d. The supply and the demand of domestic products and services on the domestic market are relatively small scale, which is a serious restrictive shortcoming in the development of the country.

### 3. A need for remodeling the economy

The experiences (positive or negative) of the world economic crisis are used for remodeling the global economic map. For many countries in the world it is a sign of a necessary alteration of their own economic model, if they want to follow the new world trends.

The Republic of Macedonia is one of those countries. New modeling is necessary for the Macedonian economy, not only because of the impact and effects of the crisis, but also because of the need for establishing a basis for the more dynamic, long - lasting and sustainable future development.

The existing conditions and favorable actions in the economic and social area in the upcoming period indicate the necessity of introducing the so-called *holistic approach* (14, 2011, p.4.) in creating a future medium-term model for economic development.

Basically, that means the focus should not be only on macroeconomic and financial policies but also on creating jobs and providing social protection. However, for the realization of such an approach, an appropriate restructuring of the economy is necessary, which mainly includes activities to encourage the development of small/medium-sized enterprises (SME), increasing the production and diversifying the offer of goods and services on the domestic and foreign markets.

In order to overcome the weaknesses the economy showed during the crisis, to protect itself against future crises and to provide conditions for achieving sustainable economic development, the activities of the economic policy makers and economic actors in the country (which should be dominated by Small and Medium Enterprises) in the next period should be directed towards diversification of production of goods and services offered at home, which could be offered to foreign markets as well. Actions should be aimed at encouraging existing and new companies to operate in the areas of services, agriculture, competing industries (particularly the manufacturing industry), etc. Of particular importance is the encouragement of innovation and not just in the form of newly discovered products, but also in already existing goods and services. To achieve this goal, the following things are necessary (15, 2011, p. 4):

a. *Institutional support* for the new business ideas and business projects through:

- adjustment of legislation;
- elimination of legal restrictions wherever possible and necessary;
- fiscal support.

b. *Increase of the supply and consumption of domestic products,* which will make the economy less dependent on the world affairs and the import of finished products with the following actions:

- Subsidizing domestic production of strategic goods and services as a replacement for the same or similar products which are now exported;
- Opening of purchasing/distributional centers for planning, buying, sorting, cooling, processing and distribution of agricultural and food products;
- Promotion of alternative sources of energy: building new national hydro power plants and small household hydro power plants and household water supply stations, construction of windmills; introduction and expansion of the gas network in the country and others. This will provide greater quantities of the most important input - energy, at a lower price than the current one. It will reduce production cost and increase competitiveness of domestic products in respect of import;
- Increasing the competitiveness of domestic goods and services;

c. *Promoting domestic investment through the deployment of domestic capital,* i.e. savings that businesses and citizens have in banks and at home. That capital should be forced to be engaged in the process of economic reproduction through:

- Investing in government bonds;
- Investments in agriculture and in construction of apartments, houses, business premises and others;
- Investing in projects that are offered concessionary and/or public-private partnership (building and maintaining schools, hospitals, government administrative buildings, roads, etc.);
- Construction of alternative energy sources: sewage treatment, construction of small hydropower plants (family HPPs in the villages and the weekend houses);
- Recycling paper, glass, plastic, etc.;
- Opening individual facilities for products which are already a great part of the Macedonian tradition, like wine, brandy, brine, cheese, honey, jam, juice, milk, margarine, butter, cream, ketchup, and raw materials and comparative advantages;
- Development of rural tourism: the construction of hotels, motels, vacation homes, swimming pools, saunas, fitness centers, etc.;

- Building homes for the elderly, kindergartens, entertainment parks, dispensaries, tennis courts, playgrounds, etc.

The population capital mobilization will increase the number of newly opened companies, playoff supply of goods and services, increase the number of employees, reduce import dependence and increase the country's GDP.

d. *Finishing the started activities for improving the educational process* that needs to overcome the problem of poor or low qualifications of the workforce;

e. *Strengthening the infrastructure in the country.* The use of budget capital investments, foreign direct investment and the activation of various forms of concessionary and public-private partnership should encourage the construction of new, and finalization and reconstruction of existing infrastructure facilities (roads, railways, gasification, electrification, energy facilities, etc.). It should be done before or simultaneously with the economy reconstruction (using the Polish model), in order to avoid a situation of having a solid infrastructure, but undeveloped economy (like the Greek economy), something that on medium and long term could have adverse effects on the economy;

f. *Encourage exports.* The increased volume of domestic goods and services would be primarily aimed to satisfy domestic needs, which will reduce the country's heavy dependence on imports of some or most of these goods. At the same time, the expected increased number of newly opened businesses and increased productivity will enhance their domestic and international competitiveness. This, in addition with synchronized action of the essential macroeconomic policies will create conditions for increasing the production volume of goods and services for export.

Furthermore, such an approach will change the current unfavorable structure of export dominated only by few types of products (textile, metals, some agricultural products etc.) The number of goods and services intended for export will increase, and this will reduce the current dependence of the dominant Macedonian export products on the conjuncture movements of world markets on which they are placed.

Goods for which the economy has some competitive advantages (heavy goods, textile, manufacturing industry, agriculture, tourism, service provider, etc.) should be encouraged with government concessions, stability of the taxes and stability of the prices of input elements in their production, deployment of domestic capital for investment purposes, and other measures.

h. Because of their close interdependence, it will be necessary in the upcoming period to harmonize the relations between the most important parts of macroeconomic policy (fiscal policy, monetary policy and foreign trade policy) in the direction of their coordinated action. That will eliminate the possibility of destabilizing the economy and create conditions for starting a process of lasting and sustainable (at least at medium term) economic growth of the country.

**4. Expected results**

Newly established model of economic policy will result with multiple positive effects. Primarily, it will be manifested with the following indicators (15, 2011, p.8):

- Increase of the number of new SMSEs;
- Dynamic creation of new SME will increase the level of domestic investment by large amount and rates ever observed;
- Large number of the newly opened SME in following five-year period will be located in different branches of the industry. Their activity in the newly established environment will lead to an increase in industrial production. Fair is the assumption that in the upcoming five-year period, newly opened SME will contribute to the encouragement (increase) the average annual industrial production from a 8-10 per cent;
- The increased volume of investment by SME, supplemented by the expected increase in industrial production will subsequently contribute (in addition to the action of other constituent elements) to increase the country's GDP from an average of 6-8 percent annually in the forthcoming five-year period. This will enable the gradual reduction of differences in the level of economic development compared to that in the EU. In fact, with such rates of growth of the economy, it is realistic to expect that Macedonia will reach the level of economic growth of EU in 25-30 years;
- A logical consequence of the increasing number of SME will be newly increased number of new employees;
- Applying the aforementioned incentives will increase the volume of production that SME will have earmarked for export. It will contribute to the total exports at the country level. At the same time, increase of the production of various goods and services will cause them to place a certain ex-

tent on the domestic market. This will increase domestic consumption of those goods and services with dual positive effect: a) an increase in GDP under the influence of increased domestic consumption, and b) reducing the consumption of the relevant goods and services provided by an importation from abroad, i.e. reduction of total imports of the country;

- Increased exports or reduced imports of goods and services will lead to a gradual reduction of the deficit the country's foreign trade. It will have a direct positive impact on increasing the domestic GDP, reducing the current account deficit within the balance of payments, increasing the state foreign currency reserves and sharply reduce and possibly eliminate entirely the need for borrowing by the country abroad. Further positive consequence of such changes will be reducing the public debt, especially international debt of the country;
- Newly created model will not disturb the macroeconomic stability as a condition for future long-term, permanent and sustainable economic growth. Inflation will move into the projected frames because they are an essential element of the proposed new Central Bank monetary strategy. Significantly increased foreign exchange inflows from abroad on the basis of increased exports and reduced imports of goods and services will be a guarantee for maintaining stability of the exchange rate and without the need for new credit borrowings of the country abroad. The increased inflow of funds in the Budget on one hand, and his rational and productive use on the other hand, conditioned the permanent budget deficit to shrink and move in modest sizes from 1 to 1.5 percent of GDP. However, public debt and the international debt of the country will be reduced and will be significantly under the framework established by the Maastricht criteria.

## V. CONCLUSIONS OF THE RESEARCH

The economic growth model of selected SEE economies during pre-global economic crisis was based mainly on foreign demand and capital inflows which created big external imbalances in those countries. It was main reason why those countries were exposed to big vulnerability of external shocks. The lessons learnt from economic crisis say there is a need for revising the pre - crisis economic growth model in the selected countries as they to be less vulnerable to external shocks (remodeling the economy). New economic model will enable their long lasting and more sustainable economic growth in future.

But, all those countries are members or candidates for becoming EU members. That means there is no room for application on entirely new economy growth model since those countries have to create economic model which has to be convergent to EU one. There must be different approach by individual countries in remodeling their economies. In the center of new model there should be pointed out: changing the drivers of growth and its sources of financing; achieving greater risk mitigation through macroeconomic and financial policies; and exploring more effective cross-border linkages.

The existing conditions and favorable actions in the economic and social area in Republic of Macedonia in the upcoming period indicate the necessity of introducing the so-called *holistic approach* in creating a future medium-term model for economic development. That means the focus should not be only on macroeconomic and financial policies but also on creating jobs and providing social protection.

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# CREDIT INSTITUTIONS FOR SUSTAINABLE DEVELOPMENT AND THEIR RESPONSE TO THE FINANCIAL CRISIS

**Tzvetomir Penev**[1]

## 1. Introduction

Besides the capital markets, key role for achieving sustainable development also plays the banking system. An increasing number of credit institutions turn sustainable development into their major corporate goal and apply the principles of sustainable development into their credit policies. Despite their efforts a substantial amount of the banking activities do not lead to sustainable development in the long run. That became obvious after the burst of the US subprime mortgage crisis in 2007. That is why the so called credit institutions for sustainable development start to play a central role in the global economic development. With their activity .they complement the traditional universal commercial banks and provide financing for activities and projects, which have relatively low initial profitability but play a major role for securing sustainable development in the respective country and region. In the global scale three groups of credit institutions for sustainable development have emerged. These are the multinational development banks, the national development banks and the export agencies. Also funds for capital investment and micro financing for sustainable development have been formed. In most of the cases the above mentioned institutions coexist under the umbrella of a banking group for sustainable development.

Gutner (2002) makes a comparative analysis of the activities of the three most popular multinational development banks –the World Bank, the European Investment Bank and the European Bank for Development and Reconstruction with respect to their implementation of ecological standards as criteria for providing financing. The analysis is based on data from the financed projects in Central and Eastern Europe until 2002, which are directly related to environment protection in the region. The major contribution of the research is the finding that the degree of supporting environmental protection by the development banks depends on two major factors. The first factor is the degree of conviction of the major shareholders of these banks that financing sustainable development should be a priority for all development banks. The second factor is an institutional one and it concerns the structure of the development banks and the degree by which they differ from the structure of the universal commercial banks. In this respect the study of Gutner concentrates completely on the ecological aspect of sustainable development and on providing financing for environment protection.

The current study does not aim to make a comparative analysis of the different credit institutions for sustainable development but based on several case studies strives to outline the key role that development banks play for achieving sustainable development and to give recommendations for their further development with respect to financing and achieving sustainable development. The role that development banks play for achieving sustainable development makes them systemically important for the transmission mechanism of the monetary policy conducting on national, as well as on international level. That is why more and more of the development banks receive access to the open market operations of the central banks in the respective countries.

Multinational development banks are these kinds of credit institutions which provide financing for the economic and social development of the developing countries[2]. Such kind of institutions are the World Bank (WB), the African Development Bank (AFDB), the Asian Development Bank (ADB), the European Bank for Development and Reconstruction (EBRD) and the Inter American Development Bank (IADB). These banks are characterized with a broad structure of their shareholders, which allows raising funding from developing, as well as developed countries, which play the role of financial donors for these institutions. Each of the multinational development banks has its own legal and operational status and provides financing via the following instruments:

- Long term loans with interest rates equal to the market interest rates. The financing of these loans comes via international capital markets borrowing and lending to the governments of the developing countries.

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[2] See definition of the World Bank with regard to multinational development banks, accessible on http://go.worldbank.org/F3REECOMB1

- Long term loans with interest rates lower than the market interest rates. The financing of these loans is done via direct payments of the governments that are shareholders in these banks.
- Providing financing for preparing successful projects, technical assistance and consulting services.

In many aspects the activities of the credit institutions for sustainable development resemble the activities of the universal banks but there are several key differences that distinguish them as a self-standing institution of the financial system. First of all, they do not compete with the universal banks with respect to providing funding but complement their activity by providing funding in sectors, which are with low initial profitability and which turn out to have too risky profile in the credit assessment of the commercial banks[1]. A second key characteristic is that they provide funding to governments or require government guarantee for the projects they finance in the private sector. This fact to certain degree guarantees that the financed projects are a priority for the respective governments. The third characteristic that distinguishes the development banks from the commercial banks is the fact that the provided loans from the multinational banks for sustainable development are for longer periods and with lower interest rates compared to the loans provided by the commercial banks. The loans provided by the multinational banks are for the period of 15-20 years and with gratis period of 3 to 5 years before starting to repay the principal of the loan. The fourth and may be most important difference is that credit institutions for sustainable development may include contingent capital in their capital base, which together with the fully paid-in capital allows for higher leverage ratio[2]. For most of the credit institutions for sustainable development their contingent capital is several times higher than their paid-in capital. Only small part of their capital is fully paid-in, while the rest will be recalled in case of an accounting loss. The characteristics of the capital structure of the leading multinational banks are presented in the following table.

**Table 1**. Capital structure of leading multinational banks for development

| | IFC | IBRD | EIB | EBRD | ADB | AFDB | IADB |
|---|---|---|---|---|---|---|---|
| Equity | 17,751 | 37,555 | 40,185 | 11,515 | 15,318 | 7,432 | 20,674 |
| Paid-in capital | | 11,492 | 11,620 | 5,198 | 3,818 | 3,430 | 4,339 |
| Contingent capital | | 105,398 | 220,773 | 14,596 | 56,641 | 30,505 | 100,641 |
| AAA Contingent capital | | 75,044 | 131,608 | 12,429 | 19,460 | 8,558 | 41,026 |
| Subscribed capital | 17,751 | 112,368 | 232,392 | 19,794 | 60,751 | 34,203 | 104,980 |

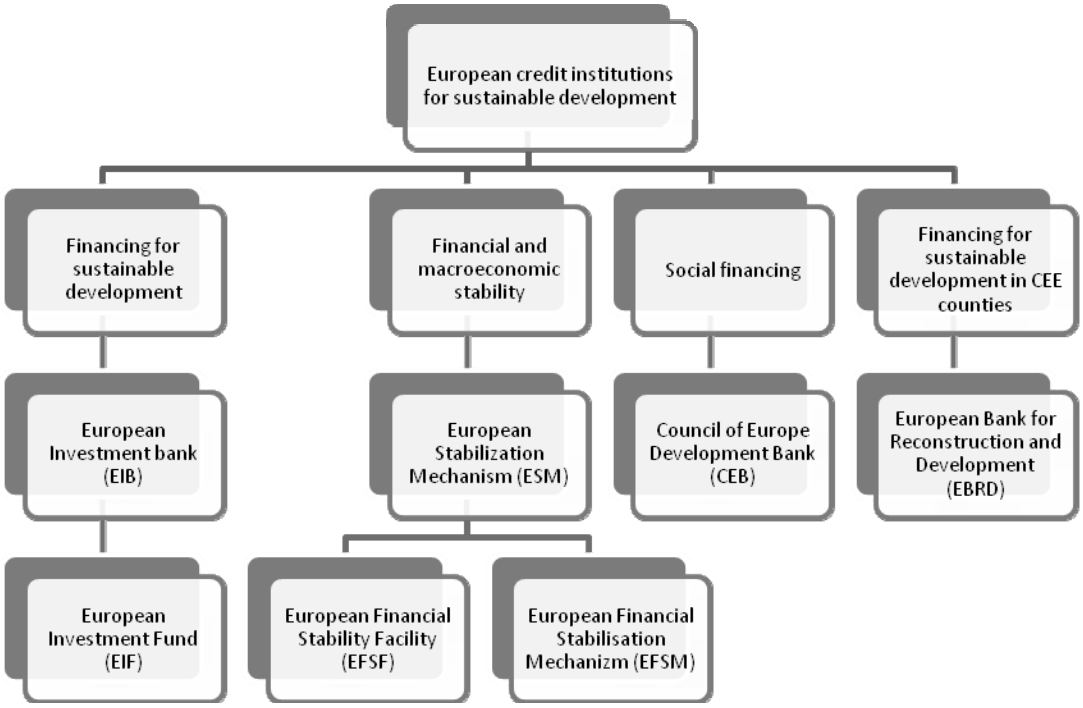
**Source:** IFC (2009, $), IBRD (June 2010, $), EIB (2010, €), EBRD (2009, €), ADB (2009, $), AFDB (2009, $), IADB (2009, $)

In the global financial system also operate other multinational development banks, which provide funding for the developing countries, but which have narrower shareholder structure and concentrate their loans to specific sectors and activities. Such kinds of institutions are the International Fund for Agricultural Development (IFAD), the Nordic Development Fund (NDF) and the Nordic Investment Bank, as well as the OPEC Fund for international development. The current study concentrates on the characteristics and perspectives of the European credit institutions for sustainable development and the Bulgarian banking group for development.

## 2. EUROPEAN CREDIT INSTITUTIONS FOR SUSTAINABLE DEVELOPMENT AND THEIR RESPONSE TO THE FINANCIAL CRISIS

On European level several institutions perform the task of credit institutions for sustainable development. These are the European Investment Bank (EIB) and the European Investment Fund (EIF), and for supporting countries that have entered into a financial crisis the European Financial Stability Facility (EFSF) and the European Financial Stabilization Mechanism (EFSM) have been created. Also the Council of Europe Development Bank provides financing for projects in the social sphere and in London functions a specially created bank –European Bank for Development and Reconstruction (EBRD), which supports the sustainable development in Central and Eastern Europe, as well as the development of the countries from the former USSR.

[1] See Gutner (2002)
[2] See High-Level Advisory Group on Climate Change Financing (2010)




**Source:** EC, EIB, EIF, EFSF, EFSM, CEB, EBRD

**Graphic 1**: European credit institutions for sustainable development

The European Investment Bank was created by the powers of the Treaty of Rome in 1958 and its major goal was to secure long term financing for the EU. Major shareholders in the bank are the EU member-states with Germany, France, Italy and the United Kingdom holding each 16.2% of the subscribed capital of the bank. Despite its shareholder structure, the EIB is an independent legal entity, which takes own responsibility for the issued debt on the international capital markets. The bank is a major shareholder in the European investment fund (EIF) and at the beginning of 2010 the shareholders of EIB had decided that the bank should not be directly involved in providing financial aid for the troubled euro zone countries. In this way the credit rating of the bank did not suffer and the institution was not burdened with additional activities, which could hinder its major task to provide investment funding on the territory of the EU. The goal of all loans provided by EIB is to secure balanced development of the member states. The bank provides funding and secures guarantees for government and private entities in the industrial, energy and environment protection sectors. Also the bank provides funding for EU candidate-member states and for countries outside the EU.

The assets of EIB reached 419.8 billion Euro at the end of 2010, which makes it the biggest multinational bank for development. The cumulative amount of loans and advances to credit institutions and customers exceeded 382 billion euro. Alone in 2010 EIB provided loans for 72 billion Euro, of which 63 billion Euro were for projects in EU and 9 billion Euro were for projects outside EU. At the end of 2010 the own funds of the bank exceeded 40.2 billion euro, which is 10.5% of the total amount of provided loans. Additionally the bank can rely on 220 billion uncalled but contingent capital from the shareholder countries. In April 2009 the Governing council of the bank increased its subscribed capital with 67 billion euro (+41%) and the payable part of 5% was subscribed by transferring part of the available reserves into paid-in capital[1].

On 8th July 2009 EIB became a counterparty of the ECB by the process of implementing the monetary policy in the eurozone and in this way received access to the refinancing operations of the ECB[2]. EIB became the first multinational development bank that gets access to the open market operations of the central bank on the money markets. The participation of EIB in the repo operations of the ECB guarantees that

[1] See EIB capital increase of EUR 67 billion takes immediate effect, Press release, 03 April 2009, accessible on http://www.eib.org/about/press/2009/2009-057-eib-capital-increase-of-eur-67-billion-takes-immediate-effect.htm

[2] See ECB Press release, 7 Май 2009 г., accessible on (http://www.ecb.int/press/pr/date/2009/html/pr090507_1.en.html)

the bank will always have access to abundant liquidity, even in the conditions of a financial crisis that had blocked the proper functioning of the money markets. The only requirement is that EIB should hold enough liquid assets that could be used as collateral by the refinancing operations of the ECB. EIB could participate in the open market operations via the Central Bank of Luxembourg and it should hold minimum required reserves in the Eurosystem in order to be an eligible counterparty. Being such allows EIB to expand its credit activity without having to hold additional liquid assets.

**Table 2**: EIB balance sheet indicators (thousand Euro)

| Indicators | 2009 | 2010 | (%) |
|---|---|---|---|
| Assets | 367,401 | 419,826 | +14.3% |
| Cumulative amount of loans and advances to credit institutions and customers | 335,317 | 382,987 | +3.4% |
| Loans for the period | 79,000 | 72,000 | -8.8% |
| Own funds | 38,069 | 40,186 | +5.6 |
| Total reserves | 24,573 | 26,450 | +7.6 |
| Profit for the period | 1,877 | 2,117 | +12.8% |

**Source:** EIB financial reports for 2009 and 2010

According to the data from the annual activity report of EIB for 2009 the crisis response of the bank was increasing the amount of the provided loans by additional 50 billion for the period 2008-2011. This increase supplements the already achieved amount of provided loans of about 45-50 billion euro per annum during the pre crisis periods. In 2010 EIB managed to fulfill and exceed this goal achieving cumulative amount of the provided loans of 61 billion, which is 11 billion euro above the initial target. Major priority of the bank is providing funding for the small and medium size enterprises in Europe, which are the major driving force of the European economy[1]. Even before the crisis EIB started talks with the beneficiaries of the loans in order to define new more efficient parameters of the financial products for SMEs. The new type of loans was initiated in 2009 and was streamlined to the SMEs via the European commercial banks. They were characterized by more simple structure, flexibility and transparency and in this way are reaching more SMEs in EU. For the period 2008-2009 EIB managed to distribute 20.8 billion euro of the new credit line and in this way moved closer to the target of the EU plan for alleviating the consequences of the crisis for the SMEs by providing 30 billion euro of new loans to the SMEs in the period 2008-2011[2]. In 2010 another 10 billion euro were provided as new loans to the SMEs and in this way EIB completed its anti-crisis program one year in advance.

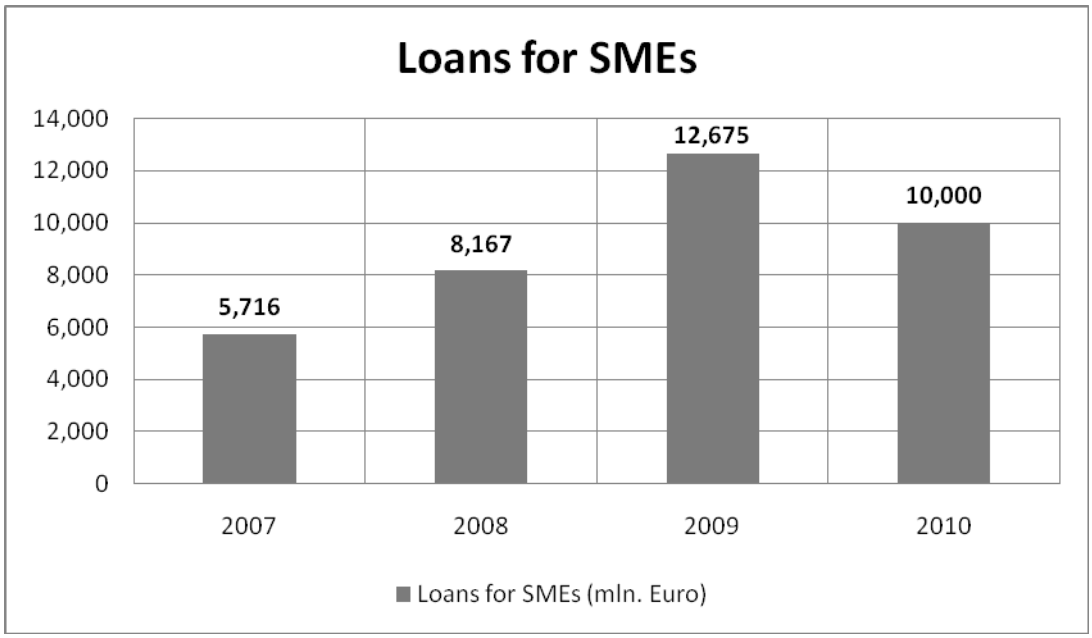
In 2009 EIB provided record amount of financing for SMEs in the amount of 12.7 billion Euro, which is an increase of 55% compared to the previous year. The EIB's financing reached more than 50 000 enterprises all over Europe and the number of the countries, in which EIB provides loans increased from 16 in 2008 to 24 in 2009. The secured funding had a multiplicative effect as for each euro provided by EIB the counterparty banks added further resources as a co financing. In 2009 EIB increased the amount of loans for the new EU member states to 2.1 billion euro, which is twice as much as in 2008. In February 2009 jointly with EBRD and WB the European Investment Bank started a crisis plan for increasing the amount of loans for the SMEs in CEE, which achieved additional funding of 10.5 billion euro for the financial intermediaries in the region.

For the period until 2012 the European Council defined the following objectives for the functioning of EIB:

- Securing financing for SMEs
- Financing for underdeveloped regions in Europe
- Financing for adaptation and mitigation of climate change
- Sustainable development financing
- Investment in sustainable, competitive and safe sources of energy
- Securing financing for innovative industries and for development of hi-tech technologies
- Supporting the development of a pan European infrastructure
- Financing sustainable development beyond the borders of EC

[1] See EIB Directors approve anti-crisis measures for 2009-2010, Press release, 16 December 2008

[2] See Communication from the Commission to the European Council, A European Economic Recovery Plan, Brussels, 26.11.2008, accessible on http://ec.europa.eu/economy_finance/publications/publication13504_en.pdf




**Source:** EIB Annual activity reports

**Graphic 2**: Provided loans for SMEs (mln. Euro)

A great part of the loans of EIB are directed to the poorest regions in EU and in 2010 the newly given loans were for the amount of 25.9 billion euro, which is 41% of all provided loans. In 2009 the provided loans were for 29 billion euro and the distribution of the provided loans for the convergence regions between EU-15 of the old member states and EU-12 of the new member states was respectively 16.2 billion euro to 12.8 billion euro. But by the indicator loans per capita the new member states received more funding. On annual basis the provided loans for developing regions in 2009 witnessed an increase of 60% before slightly decreasing in 2010. A great part of the secured funding was in the form of co financing for the projects supported by the Structural funds of the EU.

**Table 3**: Provided funding by sectors in 2009 and 2010

| Sectors | 2009 | % | 2010 | % |
|---|---|---|---|---|
| Communications and infrastructure | 8 840 | 37 | 8 099 | 36 |
| Energy | 4 365 | 18 | 4 718 | 21 |
| Development of urban areas | 1 682 | 7 | 2 020 | 9 |
| Water, canalization and waste treatment | 2 128 | 9 | 999 | 4 |
| Health and education | 1 007 | 4 | 3 158 | 14 |
| Industry | 3 836 | 16 | 1 302 | 6 |
| Services | 1771 | 7 | 1 850 | 8 |
| Agriculture, fishery, forestry | | | 130 | 1 |
| **Total** | **23 630** | **100** | **22 276** | **100** |

**Source:** EIB annual activity reports

The financing of the processes for climate change mitigation and adaptation has turned into one of the instruments of EIB for coping with the negative effects of the global economic and financial crisis. This fact shows that the idea for sustainable development could be the catalyses for overcoming the global economic slowdown. The loans provided by EIB via the counterparty commercial banks have requirements that aim development and better utilization of renewable energy resources. EIB also pays central attention to all projects that lead to overcoming the consequences of global warming and to ceasing unsustainable usage of the natural resources and destruction of the ecosystems and biodiversity in the nature. EIB follows strictly defined principles of corporate social responsibility and sustainable development, which obey the following principles:

- EIB requires all projects that are financed by the institution to be in accordance with the EU principles and standards of environment protection and corporate social responsibility
- EIB strives to finance only projects that lead to improvement in environment and the welfare of the population
- EIB calculates and monitors its ecological footprint, both in terms of its own functioning and in terms of the projects it finances

In 2010 the amount of provided loans that had a direct effect for reducing the CO2 greenhouse emissions in the atmosphere as a result of investment in renewable energy, increasing energy efficiency and research for creating new environmentally friendly transport vehicles reached 20.5 billion Euro, which is 30% of all EIB loans compared to 17 billion Euro in 2009 and 9.8 billion Euro in 2008. EIB is among the financial institutions that are convinced that the fight against climate change is a global responsibility of all nations and that it creates a unique opportunity to create new working places, new "green" industries, as well as a chance to increase the competitiveness of the European economy. In its policy to finance energy projects EIB has the following priorities:

- Financing projects in the area of renewable energy
- Financing for improvement of energy efficiency
- Supporting scientific research for creation of new low carbon energy sources
- Investments for improving the security and diversification of energy sources by creating a pan European energy network

EIB also finances a broad spectrum of projects that aim the implementation of renewable energy such as photovoltaic power plants, on and offshore windmill power generating plants, usage of solar energy for the production of biofuels. EIB constantly increases the provided funding for renewable energy projects, reaching a peak in 2010 of 6.2 billion euro compared to 4.2 billion euro in 2009 and 2.2 billion euro in 2008. Loans for financing projects increasing energy efficiency and higher energy saving have also peaked in 2010 with provided funding of 2.3 billion Euro compared to 1.5 billion Euro in 2009 and 730 million euro in 2008. In 2010 EIB continued to finance with priority projects for improving the energy grid in Europe and projects for transportation and storage of natural gas.

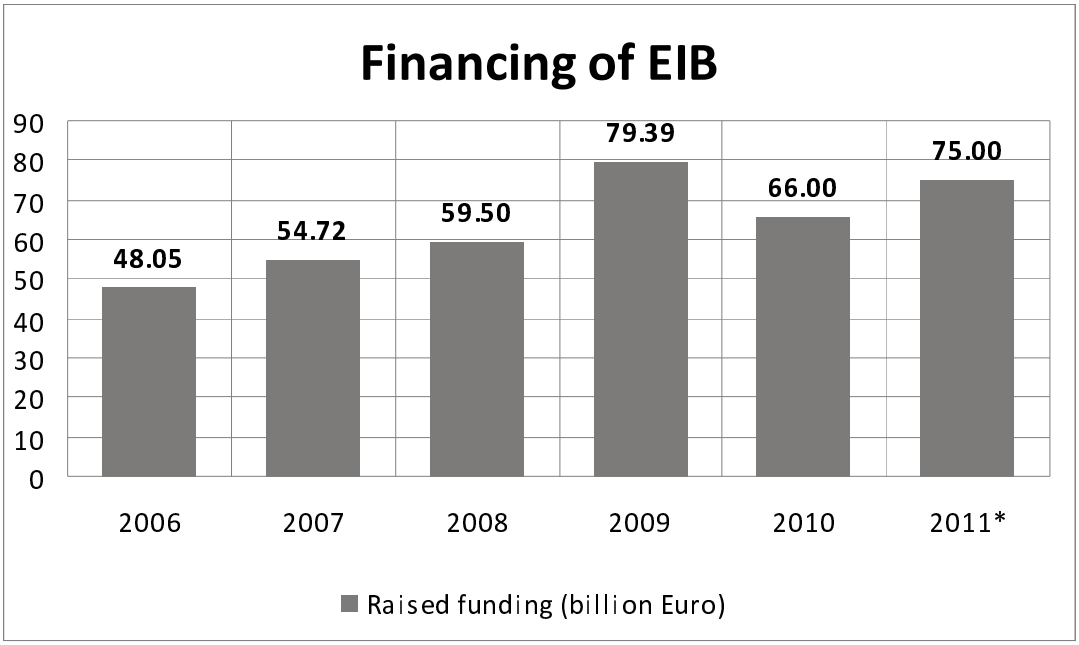
**Table 4**: EIB loans in the energy sector (billion Euro)

| Priorities | 2009 | 2010 | Промяна |
|---|---|---|---|
| Construction of a pan European energy network | 2.0 | 3.8 | +90.0% |
| Renewable energy resources | 4.2 | 6.2 | +47.6% |
| Energy efficiency | 1.5 | 2.3 | +53.3% |
| Diversity and security of energy supplies | 5.9 | 3.7 | -37.3% |
| Access to modern energy sources for accession countries | 0.3 | | |
| Credit lines | 0.2 | | |
| **Total** | **14.2** | **16.0** | **+12.7%** |

**Source:** European Investment Bank.

In order to secure financing of its activities EIB has one of the highest funding programs from all multinational banks for development. From the national development banks only the German KfW has higher funding than EIB for most of the years. In 2009 EIB superseded even KfW (74.9 billion Euro) with attracted funding of 79.4 billion euro.

In 2011 EIB aims to increase its funding to the interval 70-75 billion Euro with fixed upper bound of 75 billion euro which cannot be exceeded during the year. EIB is among the biggest global bond issuers with bonds denominated in all major world currencies. Substantial role for the EIB funding plays the short term commercial paper program for the amount of 25 billion Euro, which secures the smooth every day payments and transfers of the bank. The commercial paper program is denominated predominantly in Euro and USD but it is also possible to issue short term obligations in other currencies. EIB is among the first financial institutions that have created innovative financial instruments on the capital markets aiming to secure EU sustainable development in the long run. Such kind of an instrument is the EIB Climate Awareness Bond, which raises funding for improving energy efficiency and creation of renewable energy resources.




**Source:** EIB annual reports

**Graphic 3**: Raised funding by EIB (billion Euro)

Besides providing investment funding for innovative projects and for securing balanced growth in EU the European credit institutions for sustainable development play crucial role for guaranteeing the EU financial stability, particularly during periods of financial and economic turmoil. In May 2010 the European Council in close cooperation with the IMF launched an unprecedented package of financial support measures for the amount of 750 billion euro aiming to keep the financial and macroeconomic stability in EU[1]. The measures envisaged the ***European Financial Stabilization Mechanism (EFSM)*** for the amount of 60 billion euro, which is going to issue bonds on the international capital markets and provide loans to the troubled EU countries. The new mechanism had been created on the basis of article 122 of the Lisbon treaty and resembles the already existing mechanism in support of the current accounts of the new EU member states that are not yet members of the eurozone. EFSM could provide financial support to all 27 EU member states and its bonds are guaranteed by all 27 EU member states. In addition the ***European Financial Stability Facility (EFSF)*** was established with lending capacity of 440 billion euro and is given explicit guarantees by the 16 EU countries that are also members of the eurozone and which participate in the facility commensurate to their capital key in the ECB own capital[2]. Initially the facility was established for the period of three years and it will provide financial assistance to all eurozone countries that are unable to service the payments on their foreign debt. The funding for EFSF will come from issuing bonds on the international capital markets. On its meeting on 28-29 October 2010 the European Council decided that the two above mentioned temporary financial stability mechanisms will be replaced by a permanent one- the ***European Stability Mechanism (ESM)*** that will become operational in 2013[3].

Besides the above mentioned credit institutions for sustainable development on European level there are two more multinational development banks. The first of them is the ***Council of Europe Development Bank (CEB),*** which is an independent financial institution providing financing for projects in the social sphere. The bank was created in 1956 and since then has supported the implementation of many social development projects and for overcoming many crisis situations. With its activity the bank has contributed to improving living conditions in the poorest regions of Europe[4].

[1] See Council of the European Union, Press release Extraordinary Economic and Financial Affairs Council meeting-Brussels, 9/10 May 2010, accessible on http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ecofin/114324.pdf

[2] See European Financial Stability Facility, Investor Presentation, March, 2011, accessible on http://www.efsf.europa.eu/attachments/efsf_presentation_en.pdf

[3] See Statement by the Eurogroup, 28 November 2010, accessible on http://www.consilium.europa.eu/uedocs/cms_data/docs/pressdata/en/ecofin/118050.pdf

[4] Виж Council of Europe Development Bank (2010)

The main activities of the bank are to provide loans for the projects in the social sphere and to issue bonds on the international capital markets at the most favorable conditions commensurate to the highest credit rating of AAA it possesses. The provided loans by the bank are conditional on strictly specified conditions. Priority financing had received projects, which mitigate social problems in the EU member-states that have appeared as a result of refugee crisis, inflow of emigrants or other shifts of people as a result of natural and ecological disasters.

With the years the range of the activities of the bank has substantially widened and now encompasses projects in many social spheres including education, health services, residential services for the socially weak citizens, fighting unemployment, providing vocational training in the SMEs, improving living conditions and modernization in the poorest regions of Europe, building infrastructure for the more efficient functioning of the administrative and judicial systems, environment protection and preservation of the cultural and historical heritage. The three major directions of the activities of the Council of Europe Development Bank could be summarized in the following three groups:

- Financing for social integration-includes all activities for improving the conditions of living for refugees, immigrants and socially weak citizens
- Crisis financing as a consequence of disasters and emergency situations-includes all activities for overcoming natural disasters and industrial emergency situations, as well as all activities for creating early warning systems and alleviating residential damages.
- Financing the improvement of the public infrastructure in the social sector-includes programs for creating and increasing working force qualifications, better health care, educational and vocational education systems, as well as establishing the required infrastructure for the proper functioning of the administrative and judicial capacity of the EU member states.

Another special multinational bank for sustainable development is the ***European Bank for Development and Reconstruction (EBRD)***, which was established in 1991 with main goal to support the transition of the CEE countries and the countries from the former USSR to functioning market economies by stimulating private initiative and entrepreneurship in these countries[1].

Shareholders in EBRD are 61 countries, EU and EIB. The number of the shareholders has increased from 40 by the year of its establishment to 61 shareholders. The member states of EBRD are the 27 EU member states, another 20 countries in which EBRD has operations, another 4 European countries (including Switzerland) and 10 non-European countries (including USA and Japan). EBRD operates in 30 countries and provides loans mainly to the private sector, invests in company shares and gives guarantees. The Statute of the EBRD requires at least an annual assessment of the progress achieved towards decentralization, demonopolization and privatization in the beneficiary countries. In case a country shows signs of slowing down the reforms or performing economic policies that lead to hindering the free functioning of the markets the Governing council of EBRD may decide to stop or reduce the provided funding to the respective country. From the shareholders of the bank the EU member states (57%) together with EIB hold 63% of the EBRD capital. Among the biggest shareholders in the bank are USA (10.1%), France, Germany, United Kingdom and Italy, each holding 8.6% of the EBRD capital. The 30 countries, in which EBRD has operations, hold 13.6% of the voting rights. At the current moment the Czech Republic is the only country-beneficiary, which has terminated its applications for new loans from the beginning of 2007 as a result of its full transition to market economy.

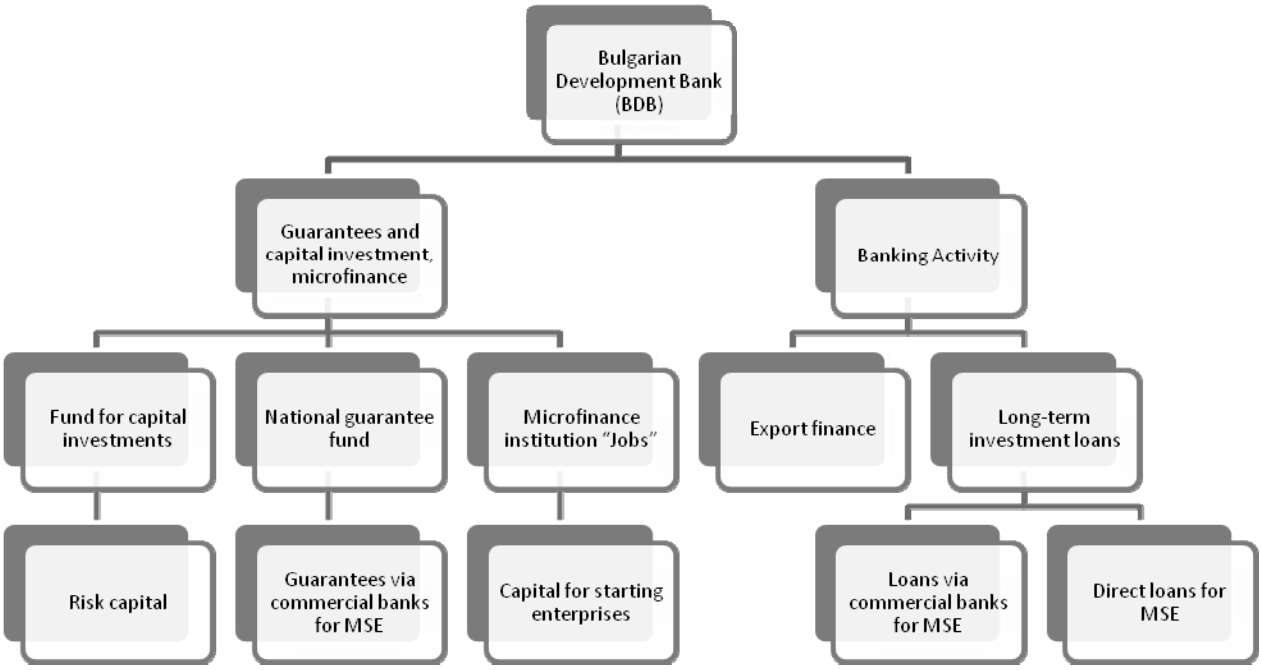
By the end of 2010 EBRD assets increased to 39.3 billion Euro, of which 14.83 billion Euro were loans for sustainable development while 5.85 billion were investments in shares, valued by their market value. Compared to 2009 that is an increase of more than 20%, as EBRD assets were 32.5 billion euro, of which 17.7 billion Euro were loans for sustainable development and 4.79 billion Euro were investments in shares. EBRD has provided predominantly loans and invested in shares of the private sector of the beneficiary countries, which stipulates the higher risk inherent in the bank assets compared to the risk of the other multinational development banks that are characterized by providing predominantly loans to sovereign countries or to economic entities that have government guarantees. For financing its activities EBRD raises funds from the international capital markets by issuing bonds. In 2011 EBRD plans to issue bonds for the amount of 7 billion euro, while in 2010 it issued bonds for 6.8 billion euro, denominated in 14 world currencies.

[1] Виж European Bank for Reconstruction and Development, About us, достъпно на http://www.ebrd.com/pages/about.shtml

Credit institutions for sustainable development operate on supranational as well as on national level and in the different countries they follow different approaches to structure their activities. In many EU countries more than one credit institutions for sustainable development have been established. Usually as separate institutions exist a development bank and an export credit agency, but in certain countries these two institutions have been structured under the umbrella of a single banking group. Furthermore, the roles and the scope of the activities of the credit institutions for sustainable development have grown substantially after the beginning of the global financial and economic crisis in 2007.

## 3. BULGARIAN BANKING GROUP FOR DEVELOPMENT

The Bulgarian Development Bank (BDB) was established by a special law in April 2008[1] and it supersedes "Nasarchitelna banka", which was established in 1999. From the very beginning of its establishment BDB's mission was to execute the government policy with respect to financing the SMEs and expanding their capacity for production, investment and export. BDB is a part of the Bulgarian banking group for development which consists of development bank, national guarantee fund, capital investment fund, which is to be formed, and a microfinance institution "Jobs".




**Source:** Bulgarian Development Bank

**Graphic 4**: Structure of the Bulgarian banking group for sustainable development

The limited access of SMEs to financing is the biggest obstacle for expanding entrepreneurship and sustainable development in the different countries. The major goal of BDB is to support the business enterprises and to form favorable business climate for the functioning and establishment of new SMEs, which is a decisive factor for increasing Bulgarian economy competitiveness on the international markets. BDB strives for increasing SMEs' economic, export and technological potential by securing favorable financing conditions. This support is needed because SMEs, as a result of their higher credit risk profile, do not receive or receive only partial funding by the commercial banks.

As of 31st December 2010 the own capital of BDB stood at 660 460 thousand leva and the major shareholder in the bank was the Ministry of Finance. At the end of 2009 the own capital of the bank was 621 743 thousand leva, which is an increase of 390 638 thousand leva compared to 2008. The major increase of the BDB capital was achieved in April and December 2008, when on two consecutive meetings

[1] Виж Закон за Българска Банка за Развитие, Държавен вестник, брой 43 от 29 април 2009 г.

of the major shareholders it was decided to increase the own capital of the banking group respectively with 50 and 500 million leva to 589 574 thousand leva. These increases of the BDB capital turned out to be the major anti crises measures for the Bulgarian economy. From the very beginning of its establishment BDB became the leading credit institution that supports achieving sustainable development in Bulgaria. The last increase in the capital of the banking group was done in July 2010, when the own capital was raised with 12 200 thousand leva to 601 773 500 leva.

**Table 5**: BDB Balance sheet indicators (2007-2010 г.)

| (thousand leva) | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|
| Assets | 232,949 | 429,629 | 901,609 | 1,373,786 |
| Paid-in capital | 39,574 | 214,574 | 589,574 | 601,774 |
| Profit/Loss | 5,014 | 6,010 | 17,679 | 29,098 |
| Reserves | 14,078 | 16,531 | 32,169 | 32,362 |
| Own capital | 53,652 | 231,105 | 621,743 | 660,460 |

**Source:** BDB annual reports

The major instrument for achieving the goals of the BDB is providing medium- and long-term investment credits directly to SMEs or via the commercial banks in the country. With the establishment and development of BDB as a typical bank for sustainable development in 2008, a substantial change in the structure of the bank credit portfolio could be observed. The direct financing for SMEs was gradually replaced by indirect financing in the form of credit lines by the local commercial banks. At the end of 2010 the ratio of direct to indirect financing shifted in favor of indirect financing, which increased to 64.2%, while direct financing shrank to 35.8%. BDB considers increasing the share of indirect financing as a long term sustainable goal.

**Table 6**: Structure of the BDB credit portfolio by type of clients

| (%) | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|
| MSEs | 94.68 | 72.62 | 39.69 | 28.40 |
| Government sector | 0 | 0 | 0 | 20.57 |
| Banking and financial institutions | 5.05 | 26.84 | 60.17 | 51.02 |
| Others | 0.27 | 0.54 | 0.14 | 0.1 |

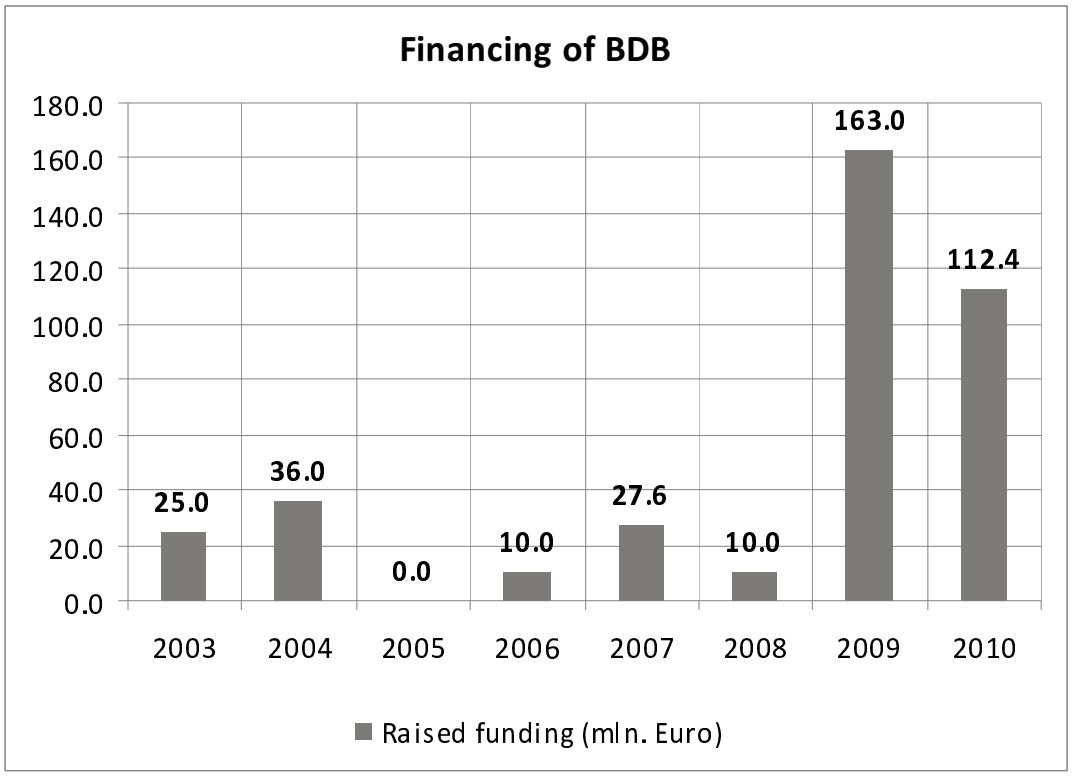
**Sources:** BDB annual reports

The change in the ratio of direct to indirect financing is a result of applying the complementarity principle for the development banks, which requires all credit institutions for sustainable development to avoid any kind of direct competition with the commercial banks in the respective country. BDB offers services and financial products that are not offered by the other participants in the financial sector or are offered to a very limited degree. Fulfilling the complementarity principle is one of the EU requirements in order to guarantee that no undisclosed government aid has been provided, which is a violation of the fair competition principles.

The sources of funding for BDB are incomes from its activities, loans and credit lines from local, foreign and international credit institutions, bond issuance on the local and international capital markets, as well as attracting EU funds and funds for sectoral and regional development. Since its establishment BDB has raised more than 500 mio. leva as credit and guarantee lines. Most of the raised funding is without a guarantee by the Bulgarian government and does not affect the indicator government debt as a percentage of GDP. Stable government debt/GDP ratio is a prerequisite for increasing the credit rating of the country and guaranteeing more favorable conditions for the newly issued bonds. For the time of its existence BDB has attracted funding from the leading credit institutions for sustainable development in Europe, Asia and North America. Among the major international BDB partners are EIB, CEB, EIF, the Chinese Development Bank, the Japanese Bank for International Development, the Nordic Investment Bank. KfW and Dexia Kommunalkredit Bank.

With the growing trust in the BDB creditworthiness the bank is striving to secure independent financing on the international capital markets by issuing senior unsecured bonds. The first BDB bond issue date back to 2007 and is for the amount of 5 mln. Leva. The issued bond was with initial time to maturity of 2 years and coupon payment of 4.75%. The raised funding was used to provide investment and turnover

capital to the SMEs. The second issue dates back to 2010 and is for the amount of 20 mln. euro, with initial time to maturity of 5 years and coupon payment of 5%. The attracted financial resources are used to provide loans in the area of energy production from renewable resources and environment protection. This issue was reopened at the end of 2010 with additional 20 mlo. euro five-year note but with lower coupon payment of 4.8%. In order to achieve higher liquidity parameters of the note the whole issued amount of 40 mln. Euro was registered for secondary trading by the Financial Supervision Commission (FSC) and listed on the unofficial segment of the Bulgarian Stock Exchange (BSE).




**Source:** BDB and own calculations

**Graphic 5**: Raised funding for the period 2003-2010 (mln. Euro)

In this context the policy of BDB to raise funding on the international capital markets via unsecured bonds should become BDB's priority. With the gradual waning of the effects of the global financial and economic crisis and with Bulgaria getting closer to fulfilling the Maastricht criteria and joining the euro area, the conditions for BDB will become even more favorable. BDB should strive to formulate a clear funding program that aims issuing bonds denominated in different currencies and with different time to maturity on the capital and the money markets. On the money market BDB could start a commercial paper program denominated in leva and euro. On the capital markets BDB should aim to build a complete and liquid yield curve by issuing bonds with time to maturity of two, five, ten and fifteen years. Entering the international capital markets by issuing benchmark unsecured bonds will play a crucial role for securing the sustainable development of the country.

Major part of the raised funding by BDB goes for providing loans to the SMEs in Bulgaria. These loans play crucial role for increasing SMEs' competitiveness. In the conditions of a global financial and economic crisis the SMEs are the most vulnerable economic entities because they suffer worst from the decreased amount of lending by the commercial banks. Then BDB turns into sole provider of credit for the SMEs, such that they could overcome the consequences of the crisis and continue investing for higher efficiency and competitiveness.

All BDB investment programs for the SMEs provide funding, which starts from 20 000 leva and could reach 10 mln. Euro for the different programs. The time to maturity for the different programs could vary from one to ten years with gratis period from one to three years. In this context it is crucial for the sustainable development of the SME sector that BDB strives to provide long term loans to the SMEs. Longer terms credit lines to the SMEs will allow them to implement longer term programs for sustainable devel-

opment that will create new working places and will contribute for the increased competitiveness and export orientation of the Bulgarian economy. My view is that the maximum time to maturity for the new loans should be increased from 10 to 15 years and the gratis period, during which the principal of the loan is not repaid, should change from 3 to 5 years.

By industrial sectors the biggest share of loans provided by BDB goes to the "Industry sector". In 2010 its share increases to 31.1% with share of 24.8% at the end of 2009. The second biggest share belongs to the transport sector, which witnesses a substantial increase to 21% from 4.3% in 2009. The transport sector supersedes the construction sector, which falls to 18.6% from 21.6% in 2009. In my opinion BDB should strive for balanced distribution of its loan portfolio between all sectors of the Bulgarian economy. Only broad industrial diversification and export oriented economy could guarantee sustainable development of the country in the medium and long term. Substantial amount of loans also should be provided to business enterprises in the high tech technology sector, renewable energy and the research and development sector.

**Table 7**: Structure of the credit portfolio by sectors

| (%) | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|
| Industry | 33.6 | 22.7 | 24.8 | 31.1 |
| Tourism | 9.5 | 11.8 | 8.5 | 8.5 |
| Trade | 20.0 | 20.7 | 16.2 | 4.8 |
| Agriculture | 12.3 | 10.2 | 8.3 | 5.6 |
| Construction | 13.7 | 15.5 | 21.6 | 18.6 |
| Transport | 4.5 | 2.0 | 4.3 | 21.0 |
| Real estate | 1.3 | 7.7 | 6.0 | |
| Other | 5.2 | 9.4 | 10.2 | 10.5 |
| **Total** | **100** | **100** | **100** | **100** |

**Source:** BDB annual reports

## 4. CONCLUSIONS

The financial crisis that began in 2007 has shown that the sustainable development of a country depends strongly on the activities of the credit institutions for sustainable development. These institutions complement the activities of the commercial banks and secure financing for business projects that are too risky and with too low degree of profitability in order to receive a credit line from the traditional banking system. In crisis conditions development banks play a key role for the SMEs to preserve their access to sustainable financing. The credit institutions for sustainable development gradually become the key institutions for financing the following directions of sustainable development:

- Raising funding for the SMEs, which are the most important economic entities creating new jobs
- Financing of export oriented industry sectors and creation of a flexible and competitive economy
- Financing of projects for mitigation and adaptation of the climate change problems
- Investments for creation of sustainable, competitive and safe energy sources
- Investment in innovative and high tech industry sectors
- Crisis response and securing macroeconomic and financial stability

The Bulgarian banking group for development has played a key role for keeping the Bulgarian economy on the trajectory of sustainable development. Good start has been given in 2008, when the Bulgarian development Bank was established following the leading European experience and creating a flexible, efficient and working structure of the bank. A successful decision has been to put a development bank, a guarantee fund and a capital investment fund under the umbrella of a single banking group for development. BDB has played a crucial role for coping with the effects of the global financial and economic crisis on the Bulgarian economy. Also much higher has been the attracted financing by the BDB for the two years of its existence. In 2009 BDB had raised 163 mln. euro of new financing and in 2010 another 112.4 billion euro, which was several times higher than all funding raised during the previous years.

Despite its successful initial years BDB has a much higher potential for contributing to the sustainable development of the country. This potential could be utilized by increasing the amount of funding raised by BDB on the international capital markets. By decreasing amount of foreign direct investments to Bulgaria as a result of the global financial crisis BDB has become the key financial institution, which contributed

substantially for the alleviation of the negative effects of the crisis on the Bulgarian economy. So far the major source of funding for BDB has been credit lines from multinational and national credit institutions for development, while the share of issued own unsecured bonds has been relatively low. With the gradual overcoming of the global financial and economic crisis and at the same time preserving sound public finances in Bulgaria, BDB should appropriate the improving financing conditions with lower cost of borrowing for the Bulgarian economy and initiate an active issuance program on the international capital markets. Substantially should be increased the target amount for the expected annual borrowing, which in my opinion should reach 1 billion euro. At the same time the process of increasing the own capital of BDB should continue and one unexplored option for that could be attracting new shareholders in BDB.

The higher amount of financing by BDB will allow the bank to broaden the scope of its activities and become a key credit institution for financing infrastructure projects in the country. BDB should also become a key source of co financing for the projects sponsored by the EU structural and regional development funds. Providing financing for the SMEs should continue to be a priority for BDB but at the same time BDB should become more active for financing projects for mitigation and adaptation of climate change problems, environment protection and development of new renewable energy resources with low CO2 emissions. All these BDB activities will contribute for increasing the competitiveness of the Bulgarian economy and achieving sustainable development in the long run.

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# SOCIAL INCLUSION: CHANGES IN BULGARIA IN THE CONTEXT OF THE EU STRATEGY FOR SUSTAINABLE DEVELOPMENT

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The Sustainable Development Strategy (SDS) of the European Union (EU), renewed in 2006, is a long-term conceptual framework for achieving sustainability, according to which economic growth, social cohesion and environmental protection go hand in hand and are mutually supporting.

One of the aims defined in this strategy is achieving social equality and cohesion by means of "[promoting] a democratic, socially inclusive, cohesive, healthy, safe and just society with respect for fundamental rights and cultural diversity that creates equal opportunities and combats discrimination in all its forms"[1].

The "Europe 2020" Strategy offers a vision of the social market economy of 21st century Europe, which is probably the most accurate contemporary definition for smart, sustainable and inclusive economy with high levels of employment, productivity and social cohesion. The three mutually supporting priorities are: developing an economy based on knowledge and innovation; promoting a more resource efficient, greener and more competitive economy; fostering a high-employment economy delivering social and territorial cohesion. These priorities are expressed in concrete headline targets and flagship initiatives that should spread on national level and be provided with the necessary resources.

From the two documents stems the necessity for achieving synergy among the ecological, economic and social dimensions of sustainable development, in other words – to achieve not merely economic growth, but inclusive growth.

## 1. Inclusive growth and Social exclusion

The conception for inclusive growth binds the increase of Gross Domestic Product with surmounting the causes which lead to social exclusion and achieving a higher degree of social cohesion in the countries and between the EU countries. In a more concrete plan it means:

- Raising total employment (the aim is by 2020 to achieve 75 % employment for the population between 20 and 64; raising the employment of particular categories such as women and young people, where the rate of employment now is lower and this increases the risk of poverty and social exclusion;
- Investing in knowledge and skills, so that the relative share of the young generation of university graduates reaches at least 40 % compared to the 31 % of today; lowering the share of early school leavers to under 10 %; expanding the benefits of lifelong education which would benefit not only the highly educated, but would also create skills;
- Extending the working life by means of creating and maintaining safe and healthy working conditions, effective healthcare, flexible schemes of combining labour and family life, pension system reforms;
- Lowering the number of poverty endangered people in the EU by 20 million, or 25 %. In 2008 85 million people live under the poverty line, which is 17 % of the population of the EU. Achieving this objective would mean lowering this percentage to about 13 %.

The conception of Inclusive growth implicitly contains an important message – the growth is not an end in itself, but a means for achieving higher well-being for all. The benefits of growth should be fairly distributed (which does not mean they should be equally distributed) for the particular groups in society, they should promote social cohesion and serve the purposes of democracy. "Inclusive growth means empowering people through high levels of employment, investing in skills, fighting poverty and modernizing labour markets, training and social protection systems so as to help people anticipate and manage change,

[1] Review of the EU Sustainable Development Strategy, COUNCIL OF THE EUROPEAN UNION, ANNEX, p. 4.

and build a cohesive society. It is also essential that the benefits of economic growth spread to all parts of the Union, including its outermost regions, thus strengthening territorial cohesion".[1]

These objectives are interrelated. Lifelong education and training is a means of adaptation of labour skills and competencies to the new technologies. The higher level of employment and the effective participation in the labour market contribute to lowering poverty and to overcoming social exclusion.

Social exclusion is defined as the impossibility for the individual to participate in the basic political, economic and social processes in the society in which he lives, therefore as the impossibility to attain the standard of life normal for the given conditions. In the European vision poverty and social exclusion are closely interrelated. Poverty is the lack of possibilities of satisfying one's basic necessities of life. It may also be defined as the lack of possibilities of life, comprising a set of phenomena associated with the level of income and consumption, with food, apparel, shelter, health, basic skills. In a broader social sense it is also defined as the lack of community, of solidarity, of rights and freedoms, as the consciousness of uncertainty in case of natural disasters, of violence, of economic changes, and the impossibility of influence over one's own status[2]. The broader approach to the definition of poverty is adopted in many documents of the European Commission. It is accepted that people live in poverty if their incomes and resources are not sufficient to provide them with the standard of life considered as normal and acceptable in the society they live in and if they are also excluded from participation in economic, social and cultural activities, and their access to fundamental rights be restricted.[3]

According to Amartya Sen, social exclusion is a concept broader than poverty. In contrast to poverty, it is better defined in the space of possibilities of attaining well-being than in the space of actual incomes and consumption. Therefore it should be seen as both a state and as a process, leading to privation. In order to analyze the phenomenon, there should be analyzed the problems of: unemployment; differences in healthcare; differences in possibilities of education; lack of social safety net; inclusion in credit markets; differences in the access to social infrastructure for the disabled; market restrictions; political and cultural exclusion. At present a relative consensus on the view of the basic features of social exclusion has been reached, namely: (1) it is multidimensional, it refers not only to income and consumption but also to a variety of other indicators of the standard of living; (2) it is a dynamic process which means that the factors which could contribute to entering and coming out of this situation should be identified; (3) it depends not only on one's own resources, but also on the insufficient and of unsatisfactory quality public resources; (4) it refers to inadequate social participation, to the lack of social integration as a result breaking off relations between the individual and the rest of society.

Specifying social inclusion (incorporation) as topical and the significance of the resultant sustainable development indicators in the monitoring reports on the EU Sustainable Development Strategy[4] stems from defining the phenomenon as a key challenge (*Key challenge 6: social inclusion, demography and migration*).

What are the changes, registered through certain indicators, concerning social exclusion in Bulgaria, and do they correspond to the tendencies in the EU?

## 2. Risk of poverty – headline indicator

One of the main purposes of *Strategy 2020* is to reduce the risk of poverty; and the changes in this field are measured by the people at risk of poverty or social exclusion indicator. This indicator corresponds to the number of people, who are at risk of poverty, who suffer privation or are living in households with very low work intensity.

The data show that Bulgaria is a country with a very high a relative share of population at risk of poverty or social exclusion. One could qualify as a very impressive the difference shown by this indicator in comparison with other countries and with the average for the EU – the share of persons threatened by risk of poverty in Bulgaria is twice as great as the EU-27 share (in some countries like Sweden it is 16 % , in Slovakia it is 19,6 %). For the period studied, the difference between Bulgaria and the EU decreases, but

[1] EUROPE 2020 A strategy for smart, sustainable and inclusive growth, EUROPEAN COMMISSION, Brussels, 3.3.2010, p. 16.

[2] OECD/DAC guidelines on Poverty Reduction.

[3] European Commission, Report on social inclusion in the 10 new Member states, 2005.

[4] See: 2009 Monitoring Report of the EU Sustainable Development Strategy.

still by this indicator we hold fist position among all the countries in the community. The changes could be evaluated as positive, but insufficiently effective.

**Table 1:** Risk of poverty

| | 2006 | | 2007 | | 2008 | | 2009 | |
|---|---|---|---|---|---|---|---|---|
| | *EU27* | *Bulgaria* | *EU27* | *Bulgaria* | *EU27* | *Bulgaria* | *EU27* | *Bulgaria* |
| *Population at-risk-of-poverty or social exclusion (Percentage of total population )* | 25.2 | 61.3 | 24.4 | 60.7 | 23.6 | 44.8 | 23.1 | 46.2 |
| *At-risk- of poverty rate after social transfers (Percentage of total population )* | 16.5 | 18.4 | 16.7 | 22.0 | 16.5 | 21.4 | 16.4 | 21.8 |

**Source:** *Eurostat*

We should note the considerably strong effect of social transfers acting towards diminishing the risk of poverty. In 2006 they reduce the risk of poverty in EU-27 by 34 %; and in Bulgaria by 74 %. In 2009 the intensity of this reduction decreases –for the EU-27 it is 29 %; and for Bulgaria it is 52 % (this could be explained by the overall decrease in the relative share of the population at risk of poverty in Bulgaria).

The risk of poverty differs among individuals with respect to gender, age and social characteristics.

**Table 2:** At-risk-of- poverty rate by gender

| *Gender* | 2006 | | 2007 | | 2008 | | 2009 | |
|---|---|---|---|---|---|---|---|---|
| | *EU27* | *Bulgaria* | *EU27* | *Bulgaria* | *EU27* | *Bulgaria* | *EU27* | *Bulgaria* |
| *Male* | 15.7 | 17.3 | 15.9 | 20.9 | 15.5 | 19.8 | 15.4 | 19.8 |
| *Female* | 17.2 | 19.3 | 17.5 | 23.0 | 17.4 | 22.9 | 17.1 | 23.7 |

**Source:** *Eurostat*

There is a pronounced tendency of maintaining persistent difference between the relative share of men and of women belonging to the category of risk of poverty (this difference corresponds to the steady difference in the remuneration for work between the two sexes). The data show that women in Bulgaria are threatened to a greater extent by the risk of poverty than the average indicator for the EU and that in comparison with 2006 their relative share has increased – i.e. the impact of the economic crisis on them is more negative.

An important aspect of the problem of the risk of poverty is its distribution with respect to age groups. The following table is a comparison of three such groups – of persons less than 18 years, of those between 25 and 49, and of those over 60.

**Table 3:** At-risk-of poverty rate by age group

| *Age group* | 2006 | | 2007 | | 2008 | | 2009 | |
|---|---|---|---|---|---|---|---|---|
| | *EU27* | *Bulgaria* | *EU27* | *Bulgaria* | *EU27* | *Bulgaria* | *EU27* | *Bulgaria* |
| *Less than 18 years* | 19.9 | 25.0 | 20.0 | 25.0 | 20.2 | 25.5 | 19.9 | 24.9 |
| *From 25 to 49 years* | 14.1 | 16.0 | 14.3 | 18.9 | 13.9 | 16.0 | 14.2 | 16.0 |
| *65 years and over* | 19.0 | 19.9 | 19.4 | 23.9 | 18.9 | 33.8 | 17.8 | 39.3 |

**Source:** *Eurostat*

Disturbing is the fact that for the age group of less than 18 years the risk of poverty has remained unchanged for the last five years. The same holds true for the EU, but it is much stronger in Bulgaria, where in 2009 (at the peak of the crisis) the value of the risk of poverty for the age group of less than 18 years is one of the highest. In the group of the elderly, the relative share of people falling into risk of poverty in 2009 is highest in the EU. This is an indirect proof of the unsatisfactory role of the pension system and the system for social welfare for reducing the risk of poverty, especially in a crisis.

The analysis of the risk of poverty could be continued along other characteristics of individuals and households. It appears that according to the type of household the single parents and persons living alone are at the highest risk. In the households of 1 person, in Bulgaria at risk of poverty are 58,4% (in the EU

this share is 25,6%). At a greatest disadvantage is the 1-person household of a single woman – for Bulgaria at risk of poverty are 67,7 %, and by this indicator we hold first place in the EU (for the EU on average this percentage is 27,2%). The household of a single man is in no better position – 39,4 % of them are at risk of poverty and this is one of the highest values in the EU (for the EU on average this percentage is 23,3%).

One of the factors contributing to the increase of the risk of poverty is the low level of education, which is also a precondition for difficult access to the labour market. The persons with an elementary school level, a primary school level and a level under secondary education are in greatest danger of poverty in an economic crisis. In 2006 30,4% of them were at risk of poverty, in 2009 their number grew and they reached 43,1% (by this indicator Bulgaria holds one of the first places in the EU).

By the indicator for people living in households with very low work intensity, Bulgaria has recently held better position compared to the average values for EU-27.

**Table 4:** People living in household with very low work intensity

| | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|
| *EU27* | 10.5 | 9.6 | 9.0 | 9.0 |
| *Bulgaria* | 14.7 | 15.9 | 8.1 | 6.9 |

**Source:** *Eurostat*

It is obvious that for the 4-year period the values of this indicator have become considerably better – the number of people living in households with low work intensity has decreased more than twice.

It is not so with the indicator for the share of the people suffering material deprivation. The data show that, as a result of the deepening of the sustained poverty in Bulgaria, more than 50% of the population suffers material deprivation.

**Table 5:** Material Deprivation rate

| | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|
| *EU27* | 19.0 | 17.9 | 17.3 | 17.1 |
| *New Member States (12 countries)* | - | 40.4 | 35.4 | 34.6 |
| *Bulgaria* | 71.4 | 72.4 | 55.0 | 55.5 |

**Source:** *Eurostat*

The coefficient of material deprivation is markedly higher for the households receiving less than 60% of the median income – 93% of these households suffer such deprivation (in the EU their share is 40%), and 30% of all households suffer housing deprivation too (in EU their share is 17%).

From the data analyzed so far, one can conclude that despite the positive tendencies in the overall decrease of the poverty indicators in the last four years, the difference between the values for Bulgaria and the average values for the EU remains considerable. The possibility that that distance will remain and even increase as a result of the current economic crisis is real.

In addition to that conclusion we should note the disadvantageous position of Bulgaria with respect to the indicators of income inequality. The 2009 Monitoring Report of the EU Sustainable Development Strategy registers an increase in income inequalities. Bulgaria is one of the countries with high values of the indicators in this sphere.

**Table 6:** Income quintile share ratio (S80/S20) and Gini coefficient

| | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|
| ***Income quintile share ratio*** | | | | |
| *EU27* | 4.9 | 4.9 | 5.0 | 4.9 |
| *New Member States (12 countries)* | - | 4.9 | 5.2 | 5.1 |
| *Bulgaria* | 5.1 | 7.0 | 6.5 | 5.9 |
| ***Gini coefficient*** | | | | |
| *EU27* | 30.2 | 30.6 | 30.7 | 30.4 |
| *New Member States (12 countries)* | - | *31.8* | *31.3* | *30.7* |
| *Bulgaria* | *31.2* | *35.1* | *35.9* | *33.4* |

**Source:** *Eurostat*

The data also show that income inequality in Bulgaria is higher than that in the United Kingdom, France, Italy, Germany, Poland, and markedly higher than that in Denmark and Sweden. An interesting fact to note is that in the countries with which belonged to one and the same social pattern in the near past, income inequality now is one of the lowest in the EU: Slovenia has a Gini coefficient of 22,7; Slovakia – of 24,8; the Czech Republic – of 25,1; Hungary – of 24,1. For these states it is characteristic that they have retained or slightly lowered income inequality in the last years.

To the higher degree of income inequality in Bulgaria contribute the taxation policy and the social protection policy. It is known that Bulgaria maintains one of the lowest income tax rates by applying a "flat rate" for all levels of income. Besides its stimulating effect, this policy additionally increases the inequality, already obtained as a result of the primary distribution of incomes.

## 3. Employment and education

Cohesive growth means, in the first place, achieving high level of employment. The demographic challenges of the aging population of Europe and of Bulgaria in particular require utilizing the available labour potential in order to meet the challenges of global competition. In the EU only 2/3 of the population aged 20-64 is employed (compared to over 70% in the USA and Japan); the unemployment rate is highest for the young people and a considerable number of the people who have been unemployed for a very long time are at risk of losing their connection with the labour market, and hence - at risk of losing the opportunities of reintegrating to its rising requirements.

For Bulgaria it is characteristic that the levels of employment are lower than the average for the EU, which is a proof of the incomplete utilization of the labour potential.

**Table 7:** Employment rate by gender, age group 20-64 years of age (%)

| | 2006 | 2007 | 2008 | 2009 | 2010 | Target 2010 | Target 2020 |
|---|---|---|---|---|---|---|---|
| ***Total*** | | | | | | | |
| ***EU27*** | **69.1** | **70.0** | **70.4** | **69.1** | **68.6** | **70.0** | **75.0** |
| ***Bulgaria*** | **65.1** | **68.4** | **70.7** | **68.8** | **65.4** | | |
| ***Male*** | | | | | | | |
| ***EU27*** | **76.9** | **77.8** | **78.0** | **75.8** | **75.1** | | |
| ***Bulgaria*** | **69.9** | **73.4** | **76.1** | **73.8** | **69.1** | **60.0** | |
| ***Female*** | | | | | | | |
| ***EU27*** | **61.3** | **62.2** | **63.0** | **62.5** | **62.1** | | |
| ***Bulgaria*** | **60.4** | **63.5** | **65.4** | **64.0** | **61.7** | | |

**Source:** Eurostat

The tendency of growth in the overall employment in our country for the 2006- 2008 period corresponds to the higher rates of economic growth and brings us nearer to achieving the Lisbon objective for 70% employment. As a result of the economic crisis, the indicator for 2009 and 2010 is worse and this places us 10 percentage points short of the targeted level for 2020. The rate of employment for women is close to the average European level and to the referent Lisbon figures. There is a reserve for increasing the overall employment by increasing the employment of the population between 55 and 60, which despite the raised required retirement age, remains lower than the referent figures.

A problematic group on the labour market in Bulgaria is the group of young people of less than 25 years, with which the unemployment rate is higher than the overall rate.

**Table 8:** Unemployment rate (%)

| | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| ***Total*** | | | | | | |
| ***EU27*** | **9.0** | **8.3** | **7.2** | **7.1** | **9.0** | **9.7** |
| ***Bulgaria*** | **10.1** | **9.0** | **6.9** | **5.6** | **6.8** | **10.2** |
| ***Less than 25years*** | | | | | | |
| ***EU27*** | **18.8** | **17.5** | **15.7** | **15.8** | **20.1** | **21.1** |
| ***Bulgaria*** | **22.3** | **19.5** | **15.1** | **12.7** | **16.2** | **23.2** |

**Source:** Eurostat

It is obvious that the tendency of decreasing the overall rate of unemployment and of the rate of youth unemployment discontinues in 2009. But while overall unemployment increases in 2009 on average by 2 percentage points compared to 2008, youth unemployment increases in the same period on average by 5 percentage points. Very significant is the fact, that for the last year under review – 2010, youth unemployment in Bulgaria increases in comparison with 2009 by 7 percentage points, while for the EU the average increase is of only 1 percentage point. In that sense, young people of less than 25 years could be defined as a group, not in equal position with respect to the labour market, and hence – vulnerable to macroeconomic activity fluctuations. This disadvantageous position puts them at risk of social exclusion.

The latter conclusion refers especially to those of them with a low level of education as a result of leaving school early. The proven relationship between labour life and education and life-long training is one of the emphases in the Strategy for cohesive growth. In the table below we give data using some of the specific indicators concerning education.

**Table 9:** Europe 2020: Education

| | 2006 | 2007 | 2008 | 2009 | 2010 | Target 2010 |
|---|---|---|---|---|---|---|
| ***Early leavers from education – total*** | | | | | | |
| **EU27** | **15.5** | **15.1** | **14.9** | **14.4** | **14.1** | **10.0** |
| **Bulgaria** | **17.3** | **14.9** | **14.8** | **14.7** | **13.9** | |
| ***Tertiary educational attainment – total*** | | | | | | |
| **EU27** | **28.9** | **30.0** | **31.1** | **32.3** | **33.6** | **40.0** |
| **Bulgaria** | **25.3** | **26.0** | **27.1** | **27.9** | **27.7** | |
| ***Life-long learning*** | | | | | | |
| **EU27** | **9.6** | **9.4** | **9.4** | **9.3** | **9.1** | **12,5** |
| **Bulgaria** | **1.3** | **1.3** | **1.4** | **1.4** | **1.2** | |

**Source:** Eurostat

*The following main conclusions* could be made from these data:

*First*, the share of early leavers from education in Bulgaria is approximately the same as the average share for the EU and although it has decreased, it is still below the targeted figure for 2010. Bulgaria is around the middle of the EU values of this indicator, but as compared to the good achievements in countries like the Czech Republic (4,9%), Slovakia (4,7%) and Poland (5,4%) the values of this indicator for our country are disturbing. The profile of the early leavers from education should be the subject of additional research, and the general opinion is that this profile is also ethnical.

*Second*, the indicator for the share of the acquired education in our country does not show improvement (on average, a slight improvement for the EU is observed). We do not achieve the objective for 2010, whereas over 10 of the EU member countries achieve it and even surpass it. All of them have a highly developed system for assisting higher education by the state in both the public and the private sector.

*Third*, weakest and unstable are the changes in the indicator of life-long training. "Strategy 2020" points out, that in this time horizon in Europe 16 million jobs will require high skills while the demand for low skills will fall by 12 million jobs. The new skills are to be developed during one's lifetime and by all employees. Now, the benefits from life-long education accumulate with the highly educated. By this indicator Bulgaria is lagging behind, and this distance will hardly diminish unless life-long education turns into part of the education strategy of the state.

The combination of the unsatisfactory values of the indicators for early leaving from education and the weak participation in life-long education is becoming a negative factor in the process of formation and development of human capital. The consequences are connected with a difficult adaptation to the requirements of the labour market, and therefore - with an increased risk of social exclusion.

## Conclusion

Cohesive growth emphasizes the achievement of high employment, investment in skills, combating poverty, for the formation of a cohesive society. These objectives correspond to the EU Sustainable Development Strategy, which considers the interrelatedness and unity of ecological, economic and social changes. The process of social inclusion must be assisted by a purposeful community policy that takes into account the specific characteristics and factors acting on a national level that could slow it down. The brief survey of the main indicators of social inclusion shows that Bulgaria is lagging behind the developed Eu-

ropean countries. After the accession of the country to the EU, positive changes have taken place, such as a rise in employment, a fall in unemployment, a lower share of the population at risk of poverty and social exclusion. The current world economic crisis is the fundamental factor hindering these positive changes, and the system for social protection has a weak influence as a factor against negative tendencies. Most of the referent values of the major indicators for social inclusion in the "Strategy 2020", projected for 2010, are not achieved, but this is characteristic of the average values of the EU-27 member countries as well. Most considerable is the difference in comparison with the developed EU member countries, including some of them, with which Bulgaria belonged to the same socio-economic model. In a peculiar manner, this is a reminder of the necessity of energizing the national policy of social inclusion and accelerating reforms in the social sphere.

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**SUSTAINABLE DEVELOPMENT**

**International conference**

Даден за печат на 22.03.2012 г.; ПК 21,25;
формат 8/60/84; тираж 100

ISBN 978-954-644-288-8

ИЗДАТЕЛСКИ КОМПЛЕКС - УНСС