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THE MULTIDIMENSIONAL INDEX OF ECONOMIC WELL-BEING FOR CENTRAL AND EASTERN EUROPEAN COUNTRIES

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ABSTRACT

This study estimates the index of economic well-being (IEWB) for fifteen Central European countries over the period 1991–2010, comparing this index with GDP at *per capita* level and growth rate. The paper reveals that certain components of the IEWB, which are not included in the measurement of GDP *per capita*, have grown slower and thus hampered the growth of overall economic well-being relative to GDP *per capita* growth. If the economic well-being of citizens is not growing as fast as an increase in GDP *per capita* in a specific country, it could mean there are some problems in social policy and recent changes. IEWB could thus be considered as an indicator of social policy based on consumption, sustainability, equity and security, the main idea of which is to reach the stage where there is a minimal difference between GDP *per capita* growth rate and well-being indicators.

Keywords: Index of economic well-being, Alternative measures of human well-being, Quality of life, Sustainable development.

INTRODUCTION

The world never stands still; it is always moving forwards and making progress, but the direction in which it moves is not always the correct one. The unwavering pursuit of economic growth – represented by the overwhelming focus on Gross Domestic Product (GDP) – has left over a billion people in dire poverty and has not notably improved the well-being of those who were already rich, nor even provided us with economic stability (Abdallah et al., 2009). As the Commission on the Measurement of Economic Performance and Social Progress noted in its 2009 report, “purely economic indicators say nothing about whether material well-being is bought at the expense of environmental and social impacts or at the risk of putting undue stress on natural resources” (Stiglitz, Sen and Fitoussi, 2009).

The main goal of democratic governments is to improve human welfare, promoting economic growth and development. Evaluating the achievements of policy measures from that perspective requires multidimensional indicators that go beyond the GDP. The analysis of alternative measures of human well-being provides an advanced understanding of the level of social and economic development, as do various policy implications concerning changes in aggregative and hierarchical well-being structures in countries.

Explaining such concepts as economic development and the measurement of human well-being has been a key problem raised by scholars for a long time. Such modern economists as Di Tella, MacCulloch and Oswald (2003), Diener and Suh (1997), McGranahan (1995), Helliwell et al. (2010), Osberg (1985), Osberg and Sharpe (1985; 2002a; 2002b; 2003), and many others pay close attention to this issue, while Knight and Rosa (2011) focus on the environmental efficiency of well-being.

The research of Osberg (1985) and Osberg and Sharpe (2002a; 2002b; 2003) reveals that a wider notion of economic well-being should include dimensions of wealth, inequality and

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security. In their studies, the index of economic well-being (IEWB) is proposed as a better measure of well-being than the GDP.

This paper is the first attempt to estimate IEWB for fifteen central European and post-Soviet Union countries for the period 1991–2010, and to compare this index with GDP *per capita* level and growth rate. The main question we aim to answer is whether the usage of IEWB as an alternative indicator shows a difference in the measurement of economic well-being compared to the usage of GDP *per capita* as the most common measure of a country's development.

RESEARCH METHODOLOGY

The goal of this study is to determine an alternative to the GDP-based metric measurement of economic and human well-being for Central European and post-Soviet Union Countries, based on Osberg and Sharpe's IEWB (2002a; 2002b; 2003).

The IEWB takes a broad view of 'economic well-being' as access to the resources needed for material consumption. The narrow focus of GDP accounting omits consideration of many issues that are important to the command over resources of individuals. The four components of the IEWB used in this paper are made up of a number of variables, as shown in Table 1. A fuller discussion of the rationale for this framework of consumption, accumulation, distribution and insecurity can be found in Osberg (1985).

It is important to note that the estimates of the IEWB in this study contain fewer variables than IEWB estimates for Canada and OECD because of greater data available for developed countries. This sort of data is not available for the countries included into this study.

The original version of the IEWB for Canada (Osberg and Sharpe, 1998) included unpaid work in the consumption flows component of the index. This was possible because Statistics Canada has produced time series estimates of the value of household production and volunteer work for Canada. Statistic agencies of our selected countries have not produced such an estimate; thus, unpaid work is not discussed or included in this paper.

Two risks in the security domain (single parent poverty and insecurity in old age) and two components of stocks of the wealth domain (real stock of natural resources and real net foreign debt) are also not included because of the lack of data.

Table 1. Components of the IEWB

Basic component	Sub-components
Consumption flows (0.25)	Real actual total household consumption (in 2005 US dollars <i>per capita</i>) Real current government spending on goods and services excluding debt service (in 2005 US dollars <i>per capita</i>) Value of leisure (in 2005 US dollars <i>per capita</i>)
Stocks of wealth (0.25)	Real capital stock, including housing (in 2005 US dollars <i>per capita</i>) Real R&D stock (in 2005 US dollars <i>per capita</i>) Real stock of human capital (in 2005 US dollars <i>per capita</i>) Real social cost of environmental degradation (CO ₂ emissions, paternal emission; in 2005 US dollars <i>per capita</i>)
Equality (0.25)	Poverty intensity (Poverty headcount at US \$2.5 per day * poverty gap at US \$2.5 per day) Income inequality (Gini coefficient)
Security (0.25)	Risk from unemployment Risk to financial security from illness

Source: authors, based on Osberg and Sharpe (2002a).

The formula for the overall index is:

$$IEWB = 0.25*(C+G+VL) + 0.25*(K+R\&D+HC-ED) + 0.25*(0.25*LIM+0.75*GINI) + 0.25*(UR+ILL)$$

C = real *per capita* adjusted equivalent personal consumption

G = real *per capita* current government spending excluding debt charges

VL = value of leisure

K = real *per capita* capital stock (including housing)

R&D = real *per capita* stock of research and development

HC = real *per capita* stock of human capital

ED = real *per capita* social costs of environmental degradation (CO₂ emissions)

LIM = poverty intensity

GINI = Gini coefficient for post-fisc (after tax and transfers) money income

UR = risk from unemployment

ILL = risk to financial security from illness

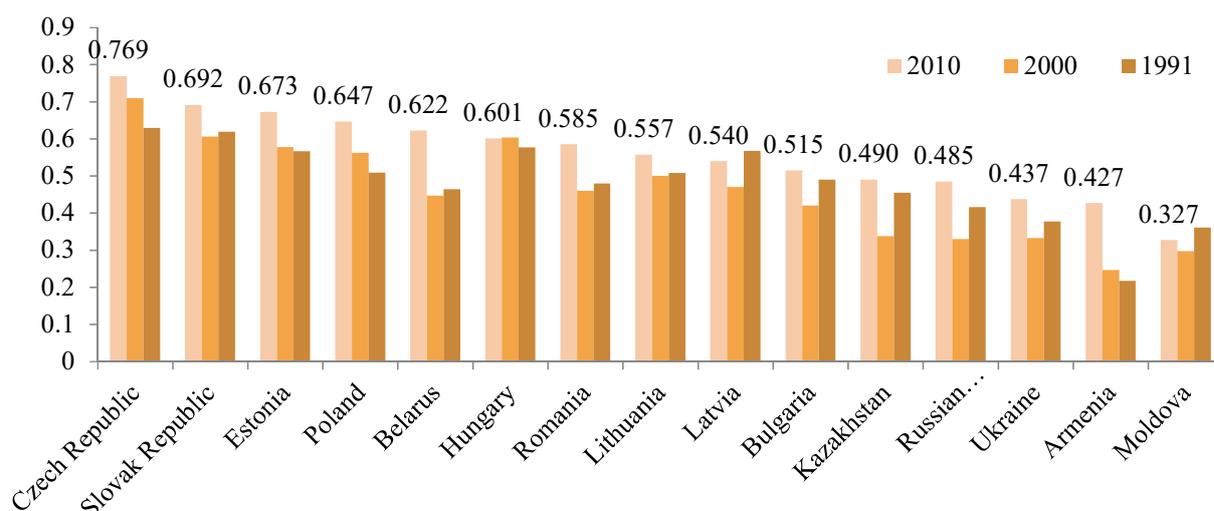
In the IEWB estimation, the linear scaling was used to standardise the range of variables to the 0–1 interval. Each of the four components of economic well-being is assigned an indexed value equal to (Value–Min)/(Max–Min), which represents the relative position of that country, in that year, on the range from Maximum (feasible value) to Minimum (feasible value), where both maximum and minimum are set at the actual extremes of the values observed in all countries and all years of the present study, plus (or minus) 10% of the actual observed range (Osberg and Sharpe, 2003).

We chose fifteen Central European and post-Soviet Union countries for estimating the IEWB: Armenia, Belarus, Bulgaria, Czech Republic, Estonia, Hungary, Kazakhstan, Latvia, Lithuania, Moldova, Poland, Romania, Russian Federation, Slovak Republic and Ukraine.

FINDINGS

This section examines the level and the dynamics of the IEWB and its components for 2010 and 2000, and for 1991 in the selected CIS and Central European countries, and compares the annual growth of the IEWB and the GDP *per capita* over 1995–2010.

Figure 1. IEWB, selected CIS and Central European Countries, 1991, 2000 and 2010



Source: authors.

Based on the ranking in 2010, the Czech Republic had the highest level of economic well-being among the fifteen selected countries, with a scaled index value of 0.769 (Figure 1).

The Slovak Republic and Estonia followed with the values of 0.692 and 0.673 correspondingly, while Moldova (index value 0.327) and Armenia (index value 0.427) were the countries with the lowest level of economic well-being.

It should be noted that most post-Soviet Union countries experienced a lower level of well-being in 2000 compared to 1991, while countries like Moldova and Latvia had not even reached their 1991 level by 2010.

Osberg and Sharpe (2011) proposed two ways of measuring progress using the IEWB: either by examining the absolute change, or by examining the percentage change (either the total change or the compound annual rate of change), in the scaled value of the index. In general, however, we consider the proportional growth to be a better measure of changes in well-being, as it takes into account the initial positions of the countries. If a country improves its index score from 0.1 to 0.2, it has doubled its well-being, and this is a much bigger achievement than another country improving its score from 0.8 to 0.9. The proportional growth captures that difference, whereas absolute changes do not.

In this study, we choose to measure the magnitude of the growth in both absolute and proportional terms, but the measuring approach does not make a huge difference in the ranking of countries in general. Table 2 provides the ranking of the selected countries based on both measurement approaches during the period of our research. The table reveals the changes in the rank of some of the countries between 1995 and 2010. For example, Belarus significantly improved its well-being and was in fifth position in the ranking right after Poland in 2010, while Hungary lost its position over time.

Table 2. Ranking of selected Central European and post-Soviet Union Countries based on values and growth of IEWB

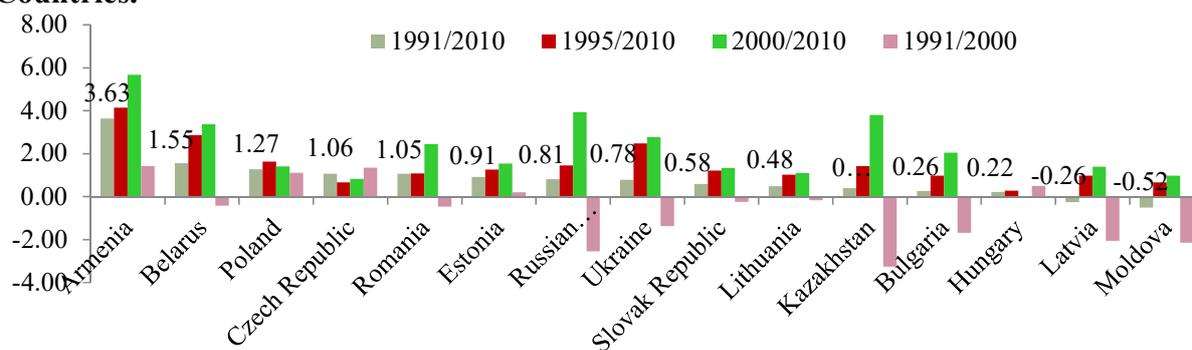
Level (points)		IEWB growth (1991–2010)	
2010	1995	Absolute (points)	Proportional (% per year)
Czech Republic	Czech Republic	Armenia	Armenia
Slovak Republic	Hungary	Belarus	Belarus
Estonia	Slovak Republic	Czech Republic	Poland
Poland	Estonia	Poland	Czech Republic
Belarus	Poland	Estonia	Romania
Hungary	Romania	Romania	Estonia
Romania	Lithuania	Slovak Republic	Russian Federation
Lithuania	Latvia	Russian Federation	Ukraine
Latvia	Bulgaria	Ukraine	Slovak Republic
Bulgaria	Belarus	Lithuania	Lithuania
Kazakhstan	Kazakhstan	Kazakhstan	Kazakhstan
Russian Federation	Russian Federation	Bulgaria	Bulgaria
Ukraine	Ukraine	Hungary	Hungary
Armenia	Moldova	Latvia	Latvia
Moldova	Armenia	Moldova	Moldova

Source: authors.

In proportional terms of IEWB growth, Armenia was far ahead over 1991-2010 with a 3.63% annual growth rate (Figure 2.). Belarus was in second place with 1.53% per year growth, followed by Poland and the Czech Republic, with 1.27% and 1.06% annual growth respectively. In absolute terms, the greatest growth was experienced by Armenia, with a 0.210 point change between 1991 and 2010, while the lowest growth was observed in Moldova (-0.034 points in absolute terms and -0.516% in proportional terms).

The growth rates of IEWB varied across countries and time. From 1991 to 2000, all post-Soviet Union countries except Armenia and Estonia experienced regression in their well-being (Figure 2). The largest annual decline in the index between 1991 and 2000 – by 3.26% and 2.55% respectively – was observed in Kazakhstan and Russian Federation, while Moldova (with a 2.55% annual decline) was in third place. Remarkable results were demonstrated by Armenia and the Czech Republic, where the IEWB increased by 1.41% and 1.34% a year during the first decade under consideration.

Figure 2. Average annual growth of IEWB in selected CIS and Central European Countries.



Source: authors.

Over the next decade (2000-2010), all countries experienced progress; some experienced a notable increase in IEWB. A considerable growth rate of almost 5.7% a year was demonstrated by Armenia, followed by 3.93% annual growth in the Russian Federation and 3.79% in Kazakhstan. The lowest development of well-being at that time was in Hungary, almost equalling zero.

The components of the IEWB

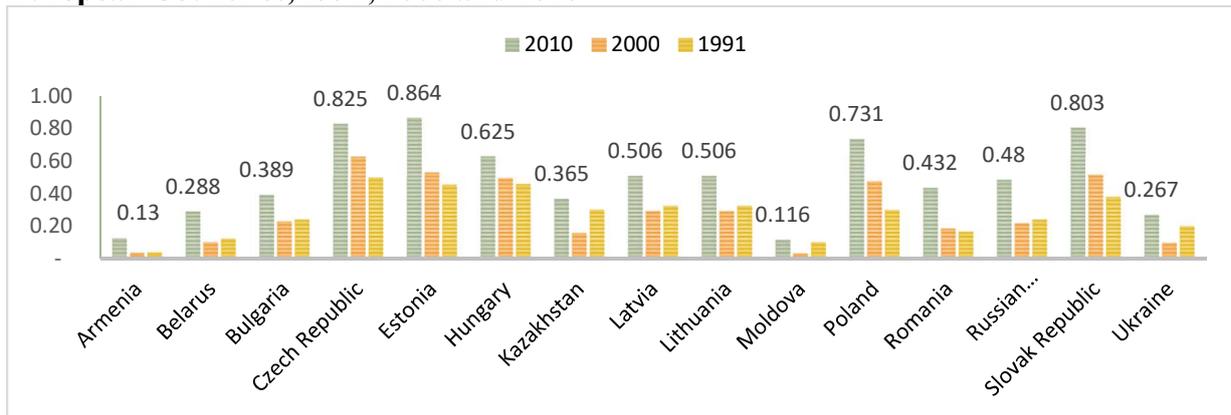
The IEWB is constructed from four domains: the average current consumption flows; the aggregate accumulation for future consumption (presented by *per capita* wealth stock); income distribution; and economic security. The four components are equally weighted; all components equally influence the general level of IEWB.

Private consumption expenditure, the government expenditure on goods, and services consumed (either directly or indirectly) by households and the adjusted relative cost (benefits) of leisure are the three components of the consumption domain of IEWB.

Based on Osberg's idea, if a person takes an additional hour of leisure time, he or she values that leisure time at least as much as the next best alternative use of the time (Osberg, 1985). We assume that the next best alternative use of leisure time is paid work in the labour force, the value of which is the total labour compensation, i.e., after-tax wages and benefits that could have been earned during that time (Osberg and Sharpe, 2002a). Trends in the value of leisure are determined by a number of factors: average hours worked per employed person, the employment rate and average hours of unemployment per working-age person.

The total adjusted consumption is computed by summing the family size-adjusted private consumption, the government expenditures and the value of leisure, and then multiplying the total value by the life expectancy index.

The largest consumption flows *per capita* in 2010 were observed in Estonia and the Czech Republic. Their consumption *per capita* flows were US \$27,498 and US \$26,820 (in 2005 US dollars) respectively, while Armenia and Moldova experienced the lowest *per capita* consumption flows (US \$5,050 and US \$4,739 *per capita*). Figure 3 depicts the values of the scaled index of the total consumption flows *per capita*.

Figure 3. Scaled index of total consumption flows *per capita*, selected CIS and Central European Countries, 1991, 2000 and 2010

Source: authors.

Society's stock of wealth – both man-made and naturally occurring – determines how sustainable its current level of consumption is. The sustainability domain includes environmental and human resources and the physical capital stock left to the next generation, which will determine whether a society is on a long-run sustainable trajectory of aggregate consumption, irrespective of the distribution of those consumption flows at the individual level (Osberg and Sharpe, 2002a).

The physical capital stock includes residential and non-residential structures, machinery and equipment in both the business and government sectors. The greater the capital stock, the greater the future productive capacity, future potential consumption flows and economic well-being. The capital stock data was supposed to be based on the perpetual inventory method where investment flows accumulate over time (with depreciation rates applied to the different assets), but the paucity of data for the 1990s and the absence of data for the 1980s forced us to use the nominal values of national wealth.

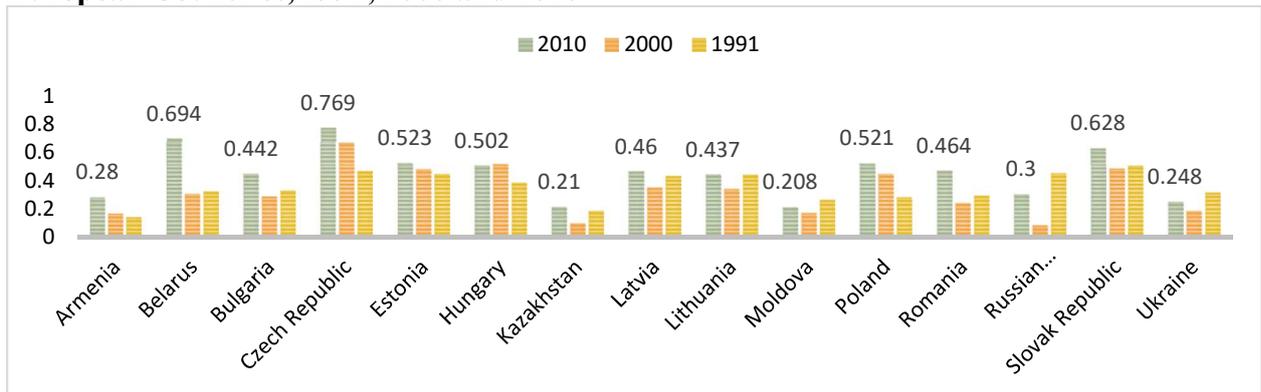
The measure used in this study contains, as explained earlier, four components: physical capital, R&D capital, human capital, and the social costs of environmental degradation

The physical capital stock presented by the gross fixed capital formation indicator from world development indicators includes land improvements (fences, ditches, drains and so on); plant, machinery and equipment purchases; and the construction of roads, railways and the like, including schools, offices, hospitals, private residential dwellings and commercial and industrial buildings.

The total wealth stocks are computed by summing the physical capital, the human capital, R&D stock and net international investment position, and then subtracting the social costs of GHG emissions.

In 2010, the greatest *per capita* stock of wealth was in the Czech Republic (US \$6,903 in 2005 US dollars) and Belarus (US \$6,099 in 2005 US dollars). Third place was maintained by the Slovak Republic with US \$5,398 in wealth. The lowest total wealth stock *per capita* belonged to Moldova, Kazakhstan and Ukraine, with US \$886, US \$908 and US \$1,321 *per capita*, respectively. In 2000, some countries (such as Kazakhstan and the Russian Federation) had negative values of capital domain due to high levels of mineral depletion and a respectively low level of investment. Figure 4 presents the values of the scaled index of the total stocks of wealth *per capita*.

Figure 4. Scaled index of total stocks of wealth *per capita*, selected CIS and Central European Countries, 1991, 2000 and 2010



Source: authors.

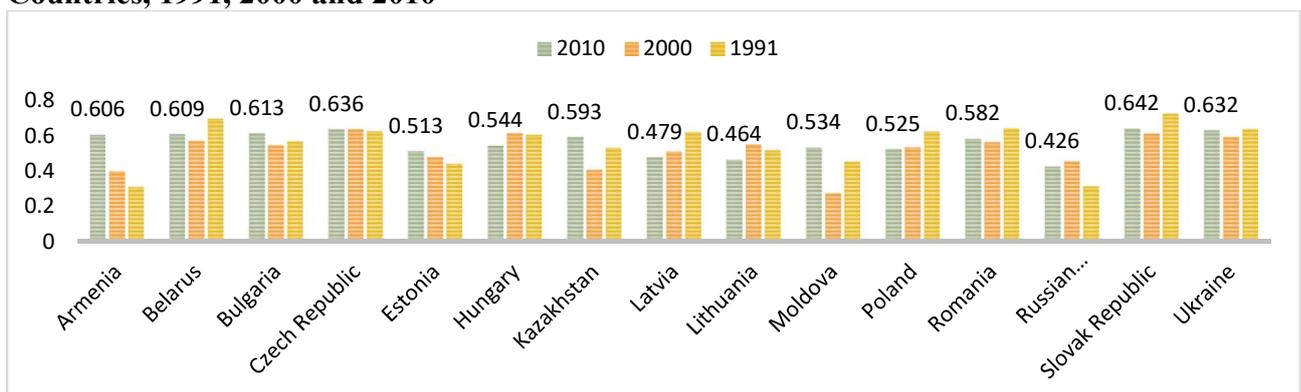
The third domain of the IEWB is economic equality. At current levels, a fall in equality, or a rise in inequality, is considered to decrease the economic well-being and *vice versa*. The equality domain consists in two components: income inequality and poverty.

We measure income inequality using the Gini index, which measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. Over country data was taken from the World Development Indicators (World Bank, 2012).

To measure poverty, we use poverty intensity, which is the product of the poverty rate and the poverty gap. The poverty rate here is defined as the percentage of the population living on less than US \$2.50 a day at 2005 international prices. The poverty gap is the average percentage difference from the poverty line of US \$2.50 a day at 2005 international prices (counting the non-poor as having zero shortfall); that measure reflects the depth of poverty as well as its incidence.

The index of the economic equality domain is the weighted sum of the scaled Gini coefficient and the scaled poverty intensity, with Gini receiving three quarters of the weight.

Figure 5. Scaled index of equality measures, selected CIS and Central European Countries, 1991, 2000 and 2010



Source: authors.

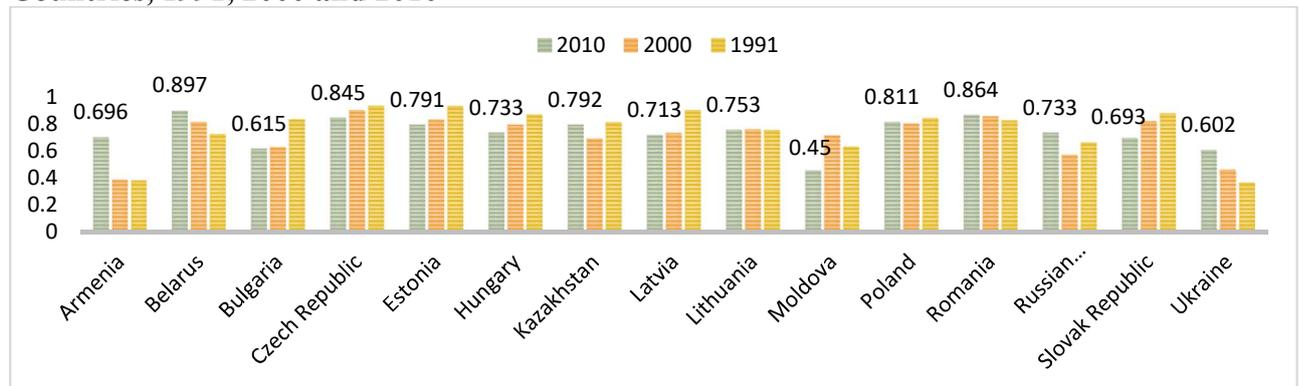
Figure 5 depicts the values of the scaled index of equality measures. In 2010, the Slovak Republic had the highest economic equality score at 0.642, followed by Ukraine (0.632) and the Czech Republic (0.636). The Russian Federation was the country with the least equality; its index score of 0.426 was not far from the next lowest score in Lithuania, at 0.464.

The economic security domain consists of two components: the risk imposed by unemployment and the financial risk from illness.

The scaled values of the two components of the economic security domain are aggregated to obtain an overall scaled index for the domain. The weights used for this aggregation procedure are constructed from the relative sizes of the populations subject to each risk. In terms of the risk of unemployment, it is assumed that the entire population aged 15–64 is subject to this risk. In 2010, this ranged between 34.1% in Moldova, to 58.7% in Kazakhstan.

The total population (i.e., 100%) is assumed to be subject to financial risk associated with illness. The component-specific weights are generated by summing the proportions of the population subject to the risks and then standardizing to unity by dividing each proportion by that sum.

Figure 6. Scaled Index of Economic Security, selected CIS and Central European Countries, 1991, 2000 and 2010



Source: authors.

Economic security (Figure 6) varies between the countries. Belarus had the highest economic security index value in 2010, which was 0.897, followed by Romania (0.864) and the Czech Republic (0.845), while Moldova was the country with the least economic security so far; its index score of 0.450 was 26% lower than next lowest score of Bulgaria (0.615).

Comparing the IEWB to GDP per capita

Comparison of the IEWB with the GDP *per capita* in 2010 and 1991 is presented in Table 3. In 1991, country ranking by GDP *per capita* in constant 2005 international US and by the IEWB did not show a big difference for such countries as Czech Republic, Armenia and Moldova. Some post-Soviet Union countries, such as the Russian Federation, Ukraine and Lithuania in the first years of independence, still had a better GDP *per capita* position than their well-being position. The opposite was true for Estonia, Kazakhstan and Belarus. The 2010 rankings show that the Czech Republic was first and Moldova last in both rankings.

Table 3. Ranking by level of *per capita* GDP and the IEWB, selected CIS and Central European Countries, 1995 and 2010

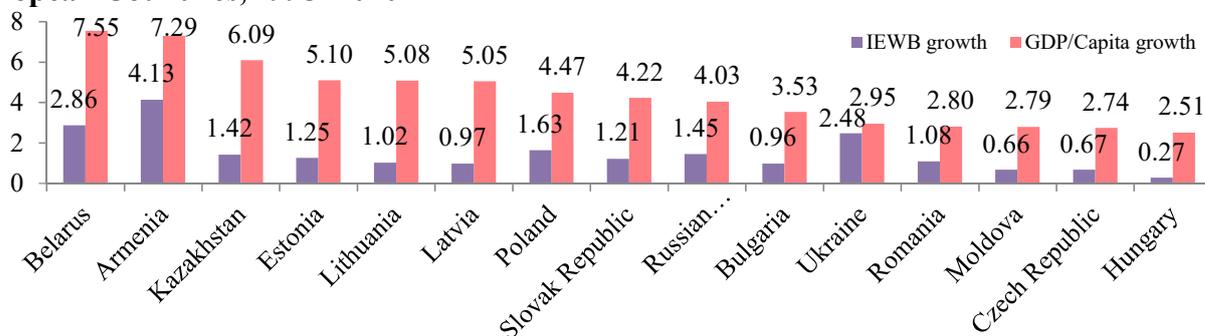
2010		1991	
IEWB	GDP	IEWB	GDP
Czech Republic	Czech Republic	Czech Republic	Czech Republic
Slovak Republic	Slovak Republic	Slovak Republic	Russian Federation
Estonia	Poland	Hungary	Lithuania
Poland	Hungary	Latvia	Hungary
Belarus	Estonia	Estonia	Slovak Republic

Hungary	Lithuania	Poland	Latvia
Romania	Russian Federation	Lithuania	Poland
Lithuania	Latvia	Bulgaria	Ukraine
Latvia	Belarus	Romania	Bulgaria
Bulgaria	Bulgaria	Belarus	Romania
Kazakhstan	Romania	Kazakhstan	Estonia
Russian Federation	Kazakhstan	Russian Federation	Belarus
Ukraine	Ukraine	Ukraine	Kazakhstan
Armenia	Armenia	Moldova	Moldova
Moldova	Moldova	Armenia	Armenia

Source: authors.

However, with the exceptions of the Czech Republic, Moldova and Armenia, there are differences in the ranking positions for all the countries based on the two indicators. Such countries as the Russian Federation, Lithuania and Latvia had a better GDP *per capita* position than the level of well-being, and Estonia, Belarus and Ukraine had a better well-being ranking than GDP *per capita*. Belarus was ninth in terms of the GDP *per capita* level in 2010, while it was fifth in terms of the level of IEWB. The biggest difference between the rankings was in the resource-based economies of the Russian Federation, which ranked seventh based on per-capita GDP and fourth-to-last in IEWB based ranking.

Figure 7. Annual growth of the IEWB and the GDP *per capita*, selected CIS and Central European Countries, 1995–2010



Source: authors.

The IEWB growth was much lower than the growth of GDP *per capita* in all countries over 1995–2010 (Figure 7). The period of 1995–2010 was chosen for comparison of the annual growth rates due to the huge economic stagnation in 1991–1995 and poor economic data, which makes the difference between GDP and IEWB even bigger. Between 1991 and 2010, there was a decline in GDP in Ukraine and Moldova, while Moldova and Latvia experienced a decline in IEWB. The period 1995–2010 is more reliable because of the recovery of post-Soviet Union countries and a positive annual growth for both GDP *per capita* and IEWB.

The fastest annual GDP *per capita* growth was observed in Belarus, which grew by 7.75% a year, but at the same time the country had only 3.1% annual growth in terms of economic well-being. Armenia was second by the growth of GDP *per capita* and first by the growth of IEWB.

It should be noted that most of the countries under consideration experienced huge gaps between the GDP and IEWB growth rates. For example, GDP *per capita* growth of 7.55% and 6.09% was observed in Belarus and Kazakhstan, but the growth of economic well-being in these countries came to only 2.86% and 1.42% correspondingly. While in such countries as Romania, Moldova, the Czech Republic and Hungary, where GDP *per capita* growth reached 2.5%–2.8% a year, the well-being situation did not change over the 15-year period by more than 1% annually.

The research above reveals that it was not the case over the 1991–2010 period that the countries with fast *per capita* GDP growth also experienced rapid growth in well-being and *vice versa*. It should also be noted that certain components of the IEWB, which are not included in the measurement of GDP *per capita*, have grown slower and thus hampered the growth of the overall economic well-being relative to GDP *per capita* growth.

CONCLUSIONS

This study aimed to determine an alternative for a GDP-based metric measurement of economic and human well-being for Central European and post-Soviet Union Countries, based on Osberg and Sharpe's IEWB (2002a). The main question we asked was whether the usage of IEWB as an alternative indicator showed a difference in the measurement of economic well-being compared to the usage of GDP *per capita* as the most common measure of a country's development.

The results of the study showed that, in 2010, the Czech Republic had the highest level of economic well-being among the fifteen selected countries with a scaled index value of 0.769. The Slovak Republic and Estonia followed. The country with the lowest level of economic well-being was Moldova, with an index value of 0.327 points. In all CIS countries, rising economic well-being was based on a rapid growth in consumption and stocks of wealth. The growth of economic security was a determinant almost for all countries investigated.

The study reached its goal, as the IEWB captured more aspects of economic well-being than the real GDP. Despite the fact that trend comparison showed a correlation between GDP *per capita* and IEWB over the 1991–2010 period, it should be noticed that certain components of the IEWB, which are not included in the measurement of GDP *per capita*, have grown slower and thus hampered the growth of overall economic well-being relative to GDP *per capita* growth.

If the economic well-being of citizens is not growing as fast as the increase in GDP *per capita* in a specific country, this could imply some problems in social policy and recent changes. Thus, the IEWB could be considered as an indicator of social policy based on consumption, sustainability, equity and security, the main idea of which is to reach a minimal difference between GDP *per capita* growth rate and the well-being indicators.

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