V4

State of the Future Index

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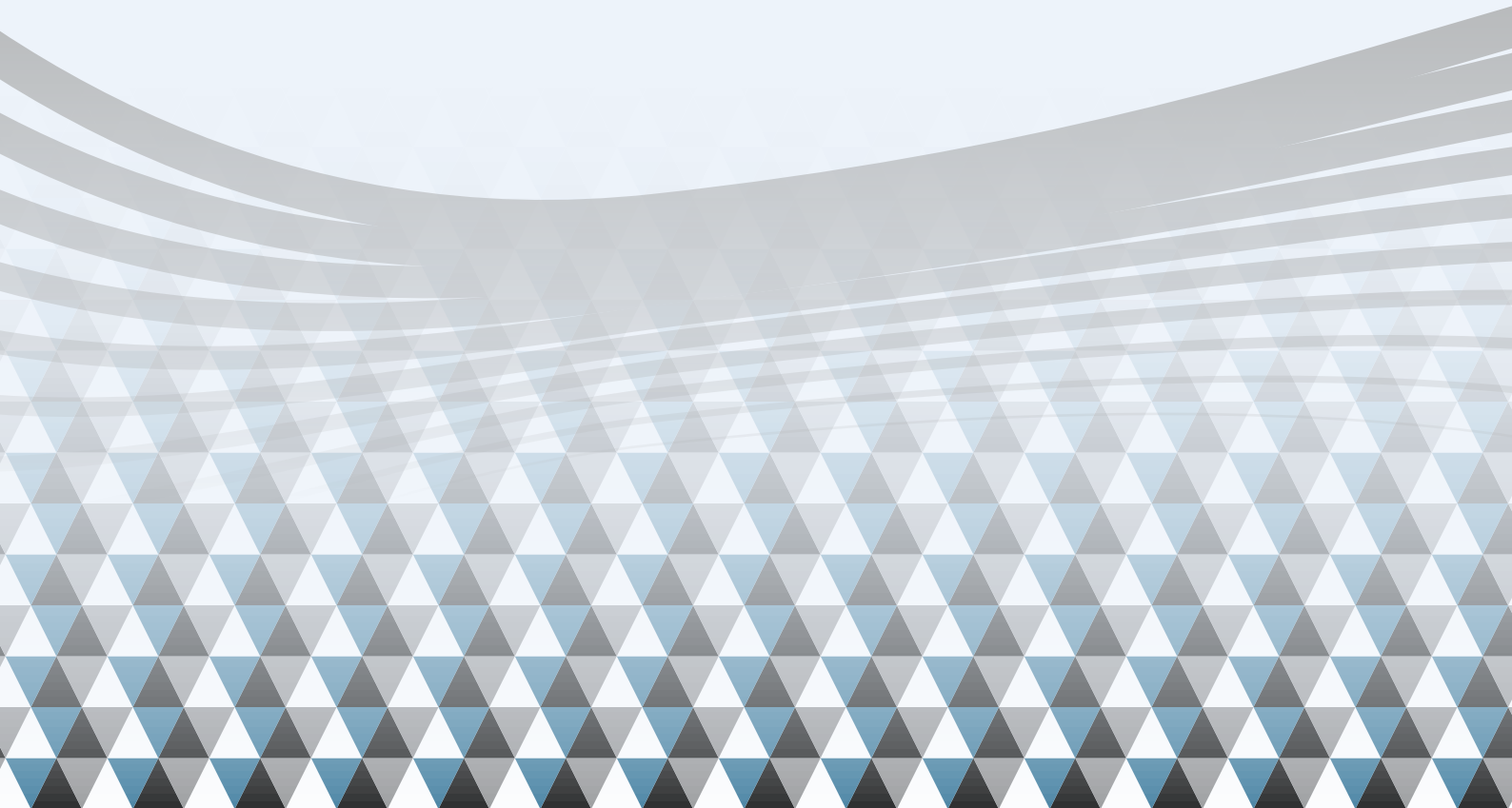

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1. Introduction

Piotr Jutkiewicz, Łukasz Macander

The Millennium Project began research which led to the construction of a State of the Future Index (SOFI) in 1999. The idea was to develop an index that would monitor whether progress is being made on the most important global challenges. It was also meant to capture the present outlook for the future and measure its state to show whether global and regional conditions are promising to get better or worse.

The possibility to calculate a State of the Future Index for Poland was first discussed when a Polish sub-node of The Millennium Project (TMP) was established at the beginning of 2009 by 4CF, a strategic foresight consultancy based in Warsaw. When two years later The Polish Society for Futures Studies was founded, calculation of a State of the Future Index for Poland started in cooperation with the Polish Node of TMP. However, due to the considerable amount of work needed to calculate the index as well as very limited funding, this first attempt, apart from contributing to the accumulation of valuable knowledge regarding the SOFI methodology, was not successful.

Three additional years had to pass before the Polish Society for Futures studies was better established and had sufficient resources to successfully apply for a grant from the International Visegrad Fund (IVF), which enabled us to revisit the subject, this time as the leader of a consortium of renowned partners from the Czech Republic, Hungary and Slovakia as well as with methodological support from 4CF.

The only V4 country which had previously calculated SOFI was the Czech Republic. A team led by P. Nováček and P. Kladivo calculated the index in 2012-2013. That approach to SOFI was based on specific indicators selected for the Czech Republic. Findings from that project gave valuable insights for the calculation of SOFI for V4 countries.

Efforts to calculate the first ever SOFI for Hungary as well as for Slovakia started in 2014, when the Enterprise Theory and Practice Doctoral School of the University of Miskolc and The Institute for Economic Research of the Slovak Academy of Sciences joined the Czech and Polish teams in the IVF funded project.

The reasoning behind these efforts was similar to what had lead other countries all around the world to undertake SOFI calculation. We wanted to have better insights into the challenges that lie ahead of our countries: to better understand the directions and intensity of change as well as, probably most importantly, to identify the factors responsible. The existing methods of tracking our countries' progress, with the most well-established measure being GDP, although very important and well-proven, were still deficient from the perspective of modern futures studies. The need for securing long-term development through future- proof (or future-ready) strategies means that tracking historic progress is far from sufficient.

We need to identifiy future challenges and wild-cards; to analyse scenarios and early warning systems, so as to better identify future threats and opportunities. The State of the Future

Index, although with lots of space for improvement and not yet well-established, seemed to be a move in the right direction.

The so-called National Comparison SOFI, with its simplified methodology and ability to compare results between countries turned out to be a more viable option for the purposes of this study. Basing on the valuable learnings from this project, we would like to develop the method further, possibly expanding its application to other European countries with a more tailored set of variables (National Focus SOFI methodology) and other improvements in order to obtain better and more relevant insights. The project is planned to continue in the immediate aftermath of the current issue, sponsored from the IVF grant.

2. State of the Future Index - Description of the Method

-Highlights from the Futures Research Methodology by The Millennium Project
(State Of the Future Index (SOFI) Method Chapter by Theodore J. Gordon)

Indexes have been constructed in the past in a variety of areas to aggregate many factors into a single number that depicts the general state of affairs. The cost of living index, for example, combines the cost of food and other consumer goods in a standard "market basket" to show how prices are changing. The Dow Jones Industrial Average aggregates the price of stocks of selected firms to create a number that quantifies the aggregate state of certain stocks on the New York Stock Exchange. Indexes such as these have very stringent quality controls applied to the data and computational processes.

The intent of the SOFI is to combine variables that indicate whether future conditions seem to be getting better or worse, to form an overall indicator of the state of the future. It is true that polls could be conducted to obtain public perceptions about the future outlook (e.g., "Do you think things are likely to get better or worse?"), but such surveys are subject to recent news and media pressures, and people answering may discount or not know about recent improvements or threats.

The SOFI is similar to other indexes since it combines many variables into a single measure, but the SOFI differs from other indexes in several important respects. Most indexes are concerned with the present or past, the SOFI is designed to measure the promise of the future. Most existing indexes are cross-sectional and are designed to compare countries to countries or various groups of countries at some point in time (usually the most recent possible). The SOFI is longitudinal and is designed to track and project change over time. While a SOFI contains variables that might also appear in a hypothetical Quality of Life Index, it contains many others as well and it focuses on the future state of the variables.

In addition, the SOFI is also unique in that it was derived from suggestions by the Millennium Project's Global Lookout Panel. Over the past several years, a number of global studies were conducted to produce lists of variables to include, determine the appropriate weights to use, and select the best and worst values anticipated for the variables. In 1999-2000 the panel recommended and rated indicators to measure progress or regress on the 15 global challenges tracked by the Millennium Project. Then in 2001 a special Global Lookout Panel rated indicators for the SOFI in terms of their normative and dystopic levels and priorities; 57 participants from about 15 countries participated in this SOFI panel. The process involved feedback that allowed respondents to add to and reassess the judgments. The study was repeated in 2006 using a Real Time Delphi and a portion of this questionnaire appears in Appendix A. Special studies were carried out to analyze changes that may have occurred year to year in the historical data base, and an experiment was conducted that linked the SOFI to a large-scale econometric model (IFs, or International Futures program).

In the SOFI, selected variables are forecasted and combined into a single measure. If the outlook of the future seems to be changing, then the SOFI would make it clear how, and the index would

make it possible to identify the factors responsible. If confidence were developed in such an index, it could be used for policy purposes: plans could be evaluated and compared on the basis of their impact on a State of the Future Index.

One of the reviewers of the original SOFI description said:

If properly communicated, the SOFI (could) become a reference and play a role in shaping the future. In this ultimate step, the SOFI surpasses its function of passive measurement to become an award for good and bad achievements, thereby contributing to changing significantly the behavior of the key actors.

How to do it

Building a State of the Future Index (SOFI) requires the answers to five questions:

1. What variables should be included in a State of the Future Index? The SOFI indicators were selected through a series of international questionnaires and refined through a review of index studies (Glenn and Gordon 2008). Other approaches might be used, of course: in a corporate setting the variables might be selected by a committee, for example. No matter what the technique, in the aggregate, the variables selected have to represent the key elements of the question that the Index is designed to address. In the case of the SOFI: does the future seem to be getting better or worse? For the corporation, the question might be identical, but the variables selected would be quite different.

2. How can very different variables be combined? In the SOFI, the best possible value for the variable equals 100 and the worst, zero. The value of the variable was then expressed as a percentage of this range. The Global Lookout Panel was asked to provide judgments about what the best (norm) and worst (dystopic) status was for each nominated indicator in 2011. These are, in fact, scenario-like assumptions about how the future may evolve.

3. How can the variables be forecasted? In the first uses of SOFI, the variables were forecasted using simple curve-fitting techniques; in later applications, Trend Impact Analysis (described elsewhere in this volume) was used. In both instances, 20 years of historical data was collected and provided the basis for the 10-year forecasts.

4. How can the variables be weighted? The Global Lookout Panel not only provided judgments about the anticipated best (norm) and worst (dystopic) value of each variable, they also rated the importance of reaching the norm or dystopic state. The criteria for assigning a high weight to a variable were: the number of people affected, the significance of the effect, whether some groups seem to be affected differentially, the time over which the effect will be felt, and whether the effect is reversible.

5. How can double accounting be avoided? There is no formula for removing redundancies; it requires careful thought and examination of the definitions of similar or overlapping variables. This is particularly difficult if two variables are similar in most respects but

differ only in nuance. Nevertheless, this step is essential and ultimately relies on judgments of the analysts to choose variables that best capture the essence of the problem being addressed.

The curve obtained by calculating the SOFI could be analyzed to find reasons for past growth, the cause for dips and valleys, and the reason why the curve changes slope in the near future. The process has been applied by individual countries (including South Africa, South Korea, Turkey, Azerbaijan, Kuwait and Venezuela) using national rather than global data, raising the possibility that national SOFIs can be constructed in a way that permits country to country comparisons, not only for the present and for history, but for the future as well. To be truly comparable, however, the national SOFIs must be similarly constructed, use a standard set of variables, and follow the same analysis course. The Millennium Project has devised a standardized method for computing national SOFIs which permits valid country to country comparisons and, for any given country, gives the ability to track the expected state of the future over time as national goals are pursued or frustrated.

Two Different Types of National SOFIs

Two major types of national SOFIs can be considered, and standards and methods will be described in this paper for both. The first is the national SOFI designed to be compared to SOFIs of other countries (call this class the ***National Comparison SOFI***). This type of SOFI uses a standard set of variables and assumptions that will be identical in other aspects of the computation. It can be used to compare countries at any point in time (e.g. cross-sectional comparison). The variables included in this SOFI will cover a broad span and have meaning and importance to essentially all countries.

The second type is the national SOFI designed to describe and track a country's progress over time, using a set of variables that may be unique to that country as well as certain other assumptions that reflect a country's goals, concerns, and expectations (call this class the ***National Focus SOFI***). Countries will not be able to perform one-to-one comparisons of National Focus SOFIs because they will be built using different country-specific elements, but they will afford a country the means of tracking its performance over time (e.g. longitudinal tracking). For example, a country concerned about a persistent drought might want to include a measure of rainfall in its variable set. Alternatively, suppose that the standard assumptions in the national comparison set indicate that population decreases are desirable, and yet a given country might be concerned about falling population. In such a National Focus SOFI, the index would indicate that a continued fall in population is undesirable.

For the first class, the National Comparison SOFI, every country should use the same set of standard variables with national data pertinent to these variables. With a few exceptions, these variables are based on the set previously used for the global SOFI. Countries should also use the same best and worst values, plus weights, as were chosen for the global SOFI, and the same set of external Trend Impact Analysis (TIA) developments and probabilities.

National Focus SOFIs would provide more latitude to the process, but sacrifice the ability to make one-to-one comparisons among countries and between a country's SOFI and a global SOFI. For this analysis, countries could use a non-standard set of variables that might include those that

have special importance to the country (for example, measurements of the policy achievements), unique goals expressed through the selection of "best" and "worst" values, variable weights, and specific TIA events of national importance and their probabilities and impacts. While the National Focus SOFIs should not be used in country to country comparisons, they are also important and useful. They can be used to track the state of the future of a country over time, evaluate the success of policies, assess the proximity to goals, and stimulate discussions about productive policies and factors that can affect their success. Furthermore, when many countries in a region have produced National Focus SOFIs, the effects of policies or developments in one country can be assessed on others in the region.

The strength of the SOFI method is its ability to synthesize the diverse factors covered by the variables and the TIA events in a form that is both easily grasped and usable for policy analysis. However, there are some dangers in such an index. The future cannot be reduced to a single number. An index of this sort can mask variations, for better or for worse, among regions, nations, or groups. The apparent precision of an index can easily be mistaken for accuracy. For these reasons, many people interested in tracking social or economic conditions prefer to keep separate and distinct all the variables that they consider important. Nevertheless, the promise of a State of the Future Index is alluring: it offers the hope of identifying positive and negative changes and points of leverage for policy, as well as achieving some measure of balance in answering questions about the outlook for the future.

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3. V4 SOFI Analysis – methodological approach

Norbert Kołos

The State of the Future Index for the Visegrad Countries has been calculated using the "National Comparison SOFI", mentioned above, with some methodological modifications. This decision to use the comparison SOFI has been made for several reasons. Firstly, SOFI has never been calculated for any of the involved countries except the Czech Republic (Kladivo et al. 2014), so it was reasonable to start with a simplified approach, get acquainted with the methodology and be able to suggest some necessary methodological adjustments before conducting a much more complex National Focus SOFI. Secondly, the possibility to compare the results with other countries around the world which have calculated national SOFIs before is valuable and would not be possible in a National Focus SOFI, which has a unique set of variables (Gordon et al. 2011).

Below is a list of steps for calculating a National SOFI with comments regarding the methodological approach in the V4 SOFI project.

Step 1: Choosing the variables. In our case this step was limited to following the set of variables selected in a study undertaken by The Millennium Project. This is a predefined set of variables which should comprise a National Comparison SOFI and it is based primarily on the Global SOFI set of variables with necessary adjustments. The following variables should be used in a National Comparison SOFI (for reasons of data availability the V4 SOFI project employed a number of equivalents, the replacements are provided in italics):

1. CO2 emissions (percent of global emissions)
2. Energy produced from non-fission, non-fossil sources (percent of total primary national energy supply) / *Non-Fossil fuel energy consumption (% of total)*
3. Food availability (kcal/cap/day)
4. Forest Lands (percent of national land area)
5. Freedom Level (as measured by Freedom House surveys, Country Score; 1= completely free; 7= completely not free)
6. GDP per capita (constant 2000 US$) / GDP per capita *(PPP, current international dollar)*
7. GDP per unit of energy use (constant 2000 PPP $ per kg of oil equivalent) / *GDP per unit of energy use (PPP $ per kg of oil equivalent)*
8. Homicides, intentional (per 100,000 population)
9. Infant mortality (deaths per 1,000 live births)

10. Internet Users (per 1,000 population)
11. Levels of Corruption (as measured by Transparency International surveys)
12. Life expectancy at birth (years)
13. Literacy rate, adult total (percent of people aged 15 and above)
14. Number of refugees displaced from the country (percent of national population)
15. People killed or injured in terrorist attacks (percent of national population)
16. People Voting in Elections (percent of national population of voting age)
17. Physicians (per 1,000 people)
18. Population growth rate (annual %)
19. Population lacking access to improved water sources (percent of national population)
20. Poverty headcount ratio at $1.25 a day (PPP) (percent of national population)
21. Prevalence of HIV (percent of national population)
22. R&D Expenditures (percent of GDP)
23. School enrollment, secondary (percent gross)
24. Seats held by women in national parliament (percent of all national members)
25. Total Debt Service (percent of GDP) / *General government gross debt (Percent of GDP)*
26. Unemployment, total (percent of national labor force)

It is distinctly visible that some of the variables on the list above clearly do not represent the most challenging issues in the Visegrad region. However, they are important from a global perspective and must be included in a Comparison SOFI in order to track progress amongst various countries. A more region-specific set of variables (either Visegrad-Group, or Europe-specific) would surely be valuable and can be developed as a continuation of this project.

Step 2: Obtaining the historical data. It is the usual practice in calculating SOFI to include data extending 20 years back in time and available for every year considered. The V4 SOFI project team has found such data (from 1995 to 2013-2014 depending on availability) for all the Visegrad Countries in various sources. However, some annual observations were missing which is why interpolations of missing values were calculated.

The most important data sources used:

- World Bank's World Development Indicators (WDI) database
- Freedom House
- International Monetary Fund
- Pardee Center for International Futures at the University of Denver - International Futures (IFs) forecasting system
- Czech Statistics Office
- Hungarian National Election Office
- Polish National Electoral Commission
- International Institute for Democracy and Electoral Assistance (International IDEA)
- World Health Organisation
- U.S. Energy Information Administration (EIA)

Whenever possible, international data sources were preferred to national data sources, since it is much harder to ensure compatibility in data gathering methods in the latter case.

Step 3: Extrapolating the data. Whenever available, we chose to use external data extrapolations prepared by renowned institutions instead of using our own calculations. The purpose of this project was not to prepare predictions for specific variables, each of which can be a huge task in itself. That is why we used predictions prepared by the International Monetary Fund, Pardee Center for International Futures at the University of Denver - International Futures (IFs) forecasting system, as well as EU Strategy 2020 targets in the case of R&D expenditures. This approach was somewhat different from the usual method used by The Millennium Project, relying solely on self-made curve-fitting.

In the case of variables for which no external extrapolations were available, simple linear or logarithmic extrapolations were applied to obtain values for the next 10 years (until 2025). In some cases where extrapolations were hardly applicable due to a high diversity of observations (e.g. in the case of Number of people voting in elections) or constituted near-to- zero values (e.g. Population lacking access to improved water sources), it was unanimously decided by the project team to keep the values constant.

Step 4: Non-dimensionalizing the variables. This is needed since, obviously, values of different variables, with different units and from different data sources cannot be simply added to one another. Non-dimensionalizing was done using the standard procedure recommended by The Millennium Project, which we will not describe in detail here. In general, most indexes (including the SOFI) use the formula: X = (actual value of the variable– MIN)/(MAX – MIN). The best and worst

values of the variables were identified in the TMP Global Lookout Panel.

Step 5: Weighting the variables, needed because not all of the variables are of equal importance. Again, we used the values provided by The Millennium Project for use in National Comparison SOFIs and obtained from a global expert panel. If a National Focus SOFI is calculated for the region in the future, such weights would have to be identified in a local expert panel.

Step 6: Best and Worst Values. Similarly to the weights, standard values for a National Comparison SOFI were used. They would have to be obtained from a local expert panel if a National Focus SOFI was calculated.

Step 7: Surprise-Free SOFI Computation. We call it a baseline SOFI, since it includes only the historical data and extrapolations and does not take into account the spectrum of possible alternative future values of the variables depending on both local and global developments. As described in the Futures Research Methodology by The Millennium Project, the calculation of the SOFI baseline is fairly straightforward:

Assume a weight of 2 is assigned to Variable1 and a weight of 1.5 to Variable 2. If the SOFI involved only these two variables, then the SOFI in any given year would be computed as follows:

$$SOFI = (2 \times V1 + 1.5 \times V2)/(2 \times V1ref + 1.5 \times V2ref)$$

where V1 and V2 are the non-dimensionalized values of variables 1 and 2 in that year, and V1ref and V2ref are the non-dimensionalized values in the reference year, usually the current year.

Step 8: Inputs to the Trend Impact Analysis. This step has been strongly modified in the V4 SOFI project. The goal of a Trend Impact Analysis (TIA) is to analyze what future developments might occur that could affect the future of a given country, how likely they are to occur and which variables (and to what extent) could they affect. TIA requires two steps: Firstly, a set of developments has to be identified. This can be done by expert panels, Delphi surveys, desk research etc. In the next step, the probability of each of these developments has to be assessed. In the third step, a cross-impact matrix consisting of SOFI variables and TIA developments is constructed. In this matrix, for each variable-development intersection, the impact of a development as well as the impact's timing (delay) have to be assessed. This means that with 26 SOFI variables and a relatively small (potentially inducing bias) set of 50 developments, there would be 2600 fields requiring assessment.

Our project team felt that to ensure a high quality of such assessments, a large scale research project vastly surpassing the scope of ours would be needed. That is why we decided to introduce a new, simplified method, which is to some extent a reversal of the original. In our method, experts are invited to a Real Time Delphi study, in which they assess the probability and amount of change for each of the variables in 3 different scenarios: Optimistic, Baseline (probability of the extrapolated value of a given variable), and Pessimistic. This means that experts have to assess the values in 6 input fields for 26 variables. We have additionally limited

the number of variables to be analyzed to 17, omitting those that were of relatively low importance or with a low probability of change in the V4 region (e.g. access to clear water or literacy rate). With 17 variables and 6 fields of each, we had 102 input fields in the questionnaire, which is a fraction of the original 2600 which would have been required by the TIA. Experts were also asked to provide arguments for their answers in the form of events or developments – thus, they were not limited to a set of predefined developments (which could be a potential source of bias). With such an approach, we felt that the amount of input required from experts is not overwhelming, which could only benefit the quality of the results. Simplification of the method has some downsides, especially when we consider how complex the future is and how simplified it has been even in the original method – the set of developments is limited, the methodology does not include cross-impacts between events etc.

Step 9: Running the TIA. Since we have not used the original TIA method, we had to modify the mechanism for using the input from Step 8. However, the general idea was kept, since as a result of our modified approach we had a set of probabilities and impacts which, similarly to the original, could be used for running a Monte Carlo analysis – thus analyzing hundreds of scenarios with different probabilities of occurrence for each country. At this stage, we have also introduced one additional modification: The original methodology contains the assumption that if the probability of an event occurring in 10 years is e.g. 100%, then the probability of it occurring next year is 10% (in other words – it is evenly increasing over time). After discussing the matter, we decided that it is not the most realistic approach. Therefore, when running a Monte Carlo analysis, apart from randomly choosing whether a given variable will increase/decrease (subject to the probabilities provided by experts), we additionally introduced a random factor deciding at which point in time the current (extrapolated) trend would be broken. Thus, we have avoided the assumption that a variable would start gradually increasing or decreasing from year 0.

Each of the 250 Monte Carlo runs which we did for each V4 is considered to be a mini- scenario, with different future values of specific variables and their aggregate impacts determining the shape of the future curve. Similarly to the original TIA method, we have presented the results in the form of a curve with best, worst and middle scenarios indicated for each variable as well as for the aggregate SOFI index for each country.

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4. SOFI Results: Hungary

Zoltan Bartha & Klara Szita Toth

Historic SOFI

Hungary's SOFI starts from 0.78 in 1995, meaning that the average yearly growth rate of the index between 1995 and 2014 was 1.3%, which shows a considerably slower progress than the PPS GDP/capita (4.2%). The SOFI climbed up to 0.98 in 2008, but the global economic crisis pushed it lower, and it was only in 2014 that it could rise above the 2008 level. Using a different approach, the 1995-2014 period can be divided into three stages: 1995-2001, when there was a relatively quick improvement in the index value, reaching an annual rate of 2.8%; 2002-2008, when there was a major slowdown, with an annual growth rate below 1%; and finally the 2009-2014 period during which the SOFI first dropped, then climbed back, but the overall value was similar in 2014 to the 2008 value. The first phase's dynamic growth could have been caused by the correction process, when some of the indicators returned back to normal after the shock of the transition period, and the development rate experienced in phase 2 is probably closer to the long term Hungarian trend.

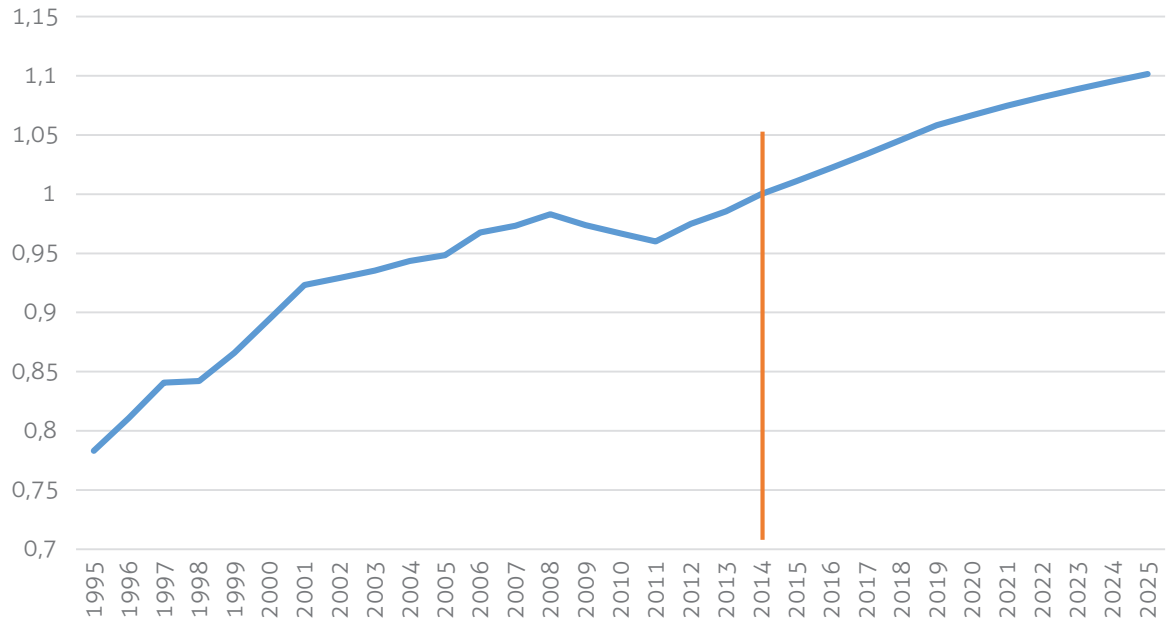

Figure 1. Historic and extrapolated SOFI for Hungary (source: own calculations)

If we take a closer look at the individual components of the index, the non-surprising general trend was that there had been a steady drop in the value of "bad" indicators, while most of the "good" indicators showed some growth. The most important outliers from this general trend are the following:

- there has been a quick improvement in renewable energies (10.8% yearly growth) and internet users (27.9% yearly growth), but both of those variables started from very low values;

- the number of people living from $1.25 or less has also dropped at a great pace (-14.7%/year);

- the three indicators where the change has gone against the trend were the population change (an annual 0.2% drop), HIV prevalence (4.6% increase/year), and the general government debt (an average of 1.3% increase every year).

Projected SOFI

The 2015-2025 projected SOFI that is based purely on the extrapolated indicator values shows slow progress (Figure 1). The average annual growth rate is around 0.9%. As the extrapolations were made on the previous 20 years' performance, it does not come as a surprise that the component's general direction of change is the same as it was in the 1995- 2014 period. There are only two exceptions, but neither of them can be interpreted as signals of something significant: according to the projections both the prevalence of HIV and the government debt will drop by a bit.

As there are no major trend changes in the projected SOFI, the threats are likely to remain the same as they were in the early 2000s. Namely, the following two areas seem to be the most threatening for Hungary:

- Population change: according to the projections, Hungary's population will be dropping at an average annual rate of 0.35%. The change however will be intensifying: by 2025 the annual drop will reach 0.4%. As a result of these changes the current Hungarian population of 9.85 million will drop to 9.5 million.

- Life expectancy at birth: although life expectancy continues to improve, the rate of change is very slow, only 0.2% per year. The slow rate of improvement would not necessarily be concerning, the current low value is what makes it a major problem. The life expectancy is projected to rise from 74.8 (2014) to 76.2 (2025), but Hungary will continue to have the worst value among the Visegrad countries. At its current rate Hungary will only reach the 2014 Czech life expectancy (77.85 years) in 2038; the current Austrian figure (81 years; Source: World Bank, World Development Indicators, http://data.worldbank.org/indicator/SP.DYN.LE00.IN) can only be reached in 2062.

SOFI scenarios

As part of our SOFI analysis a Real Time Delphi (RTD) was conducted. The goal of the RTD was to ask our experts how likely they think the projected variable values were, and to identify possible alternative paths for the individual components (by giving values and probabilities to the best and worst case scenarios). Twelve experts participated in the RTD. According to our experts the following extrapolated values are the least likely to come true by 2025:

- General government debt: according to our calculations the government debt will stay at around 78% of the GDP. The average likelihood given to this scenario is only 25%, while

the chance of a better debt/GDP ratio was estimated to be 45%.

- R&D expenditure: although the analysis projected the R&D expenditures to reach 1.8% of the GDP by 2025 (not a particularly high value), only a 25% chance was given to this value, while a worse outcome got a 45% chance.

- Seats held by women: Hungarian politics has traditionally been very masculine, but the RTD suggests that there is almost a 50% chance that the ratio of parliamentary seats held by women will rise.

- GDP per capita: the PPP GDP/capita is projected to climb to USD 28,600 by 2025, rising by an average annual rate of 2.9% in the 2015-25 period. The RTD gives a 28% probability to this outcome, while around 36-36% chances are given to a better and a worse value.

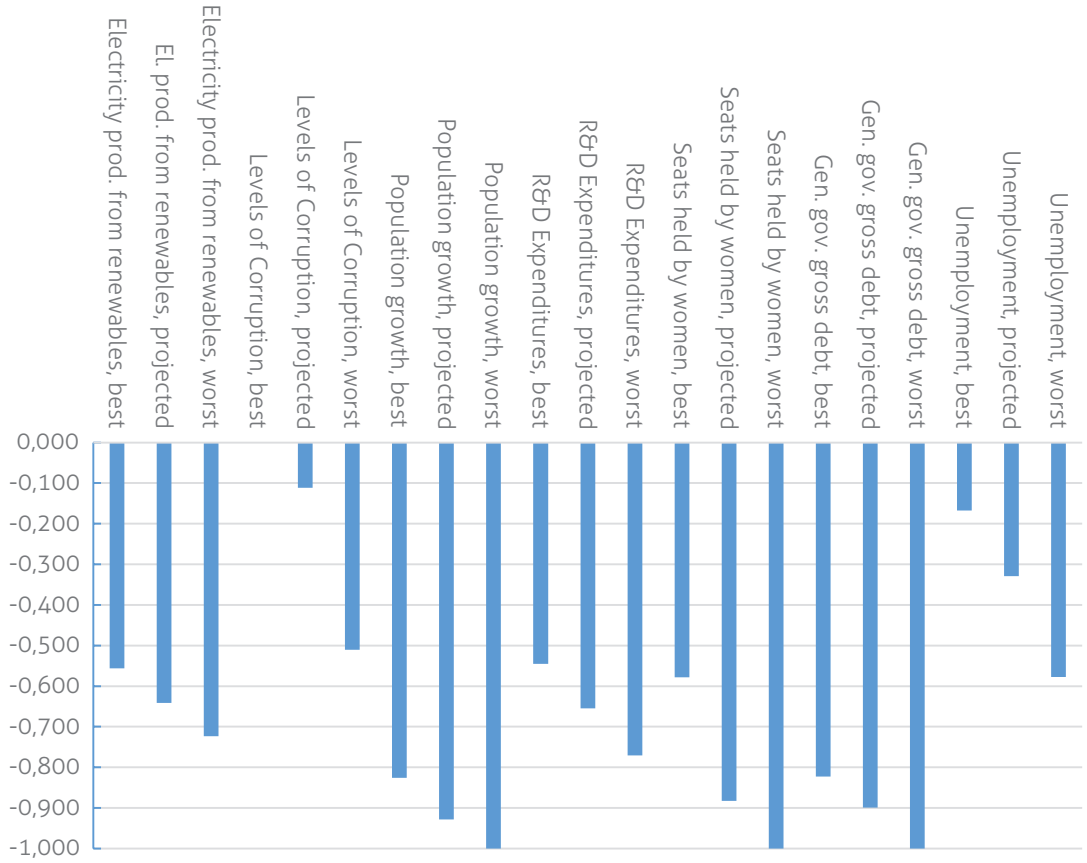

Figure 2. Standardized weighted deviation of indicator values from the maximum level (Source: own calculations)

If we take a look at how far the indicator values are from the optimal (maximum) level (Figure 2), we can identify the areas where there is a great need (and room) for improvement. Figure 2 lists seven components, where the distance from the maximum SOFI value is the greatest. All seven components have three versions, as the best and worst case scenario values obtained from the RTD are also included.

- Electricity production from renewable sources, excluding hydroelectric (% of total): this is a variable which has improved fast for Hungary, yet the 7.6% (or 9.6% if we take the best case value from the RTD) forecasted for 2025 is still way below the 20.5% maximum SOFI level. There is room for further and faster improvement, as Hungary has a significant geothermal energy potential (Szanyi-Kovacs, 2009), and the energy intensity of industrial consumption has also been improving (Kadarne, 2013).

- Levels of Corruption (as measured by Transparency International surveys): corruption is a sensitive issue in the Visegrad countries. Because it is influenced very strongly by cultural characteristics (Rethi, 2012), corruption levels can only be expected to change in the very long term.

- Population growth (annual %): as already mentioned, population change is one of the biggest challenges for Hungary.

- R&D Expenditures (percent of GDP): R&D has been in the focus of EU's Lisbon Strategy (http://ec.europa.eu/archives/growthandjobs_2009/), and its successor, Europe 2020 (http://ec.europa.eu/europe2020/index_en.htm). Hungary's weak results indicate that there is much more to be done.

- Seats held by women in the national parliament (percent of all national members): after the general elections held in 1990, 11.4% of the MPs were women. This initial number was not high in the first place, but over the next 25 years it has become even lower. Some countries have introduced quotas to improve this indicator (EC, 2012).

- General government gross debt (Percent of GDP): the Government gross debt/GDP value currently stands at around 79%. Hungary has included a 50% threshold value in its constitution. Until the threshold is reached, the budget deficit every year has to be limited to a value that ensures the reduction of the debt/GDP ratio.

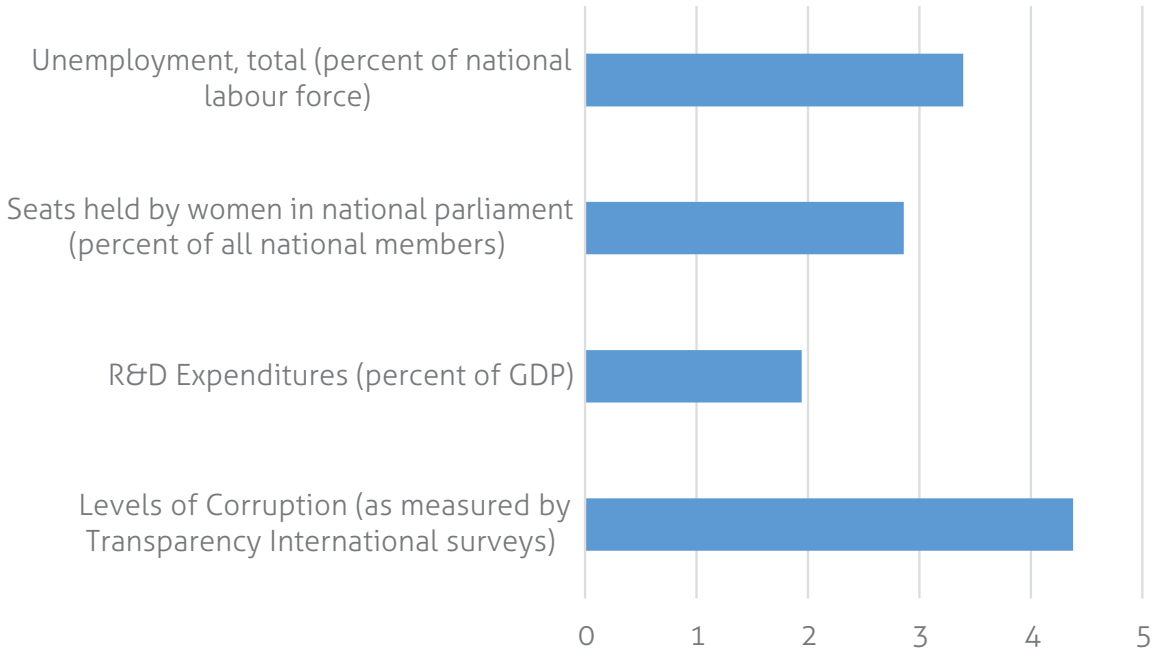

Figure 3. Standardised weighted differences between worst and best case scenarios (Source: own calculations)

Finally, by calculating the standardised weighted differences between the worst and best RTD scenario values, and picking the components where the differences are largest, we can find areas of the greatest risks and opportunities. The four largest-difference components are shown in Figure 3. Corruption, where the distance is the largest, can probably be interpreted more as a risk than an opportunity. Due to its cultural embeddedness, major leaps forward are unlikely to happen, but there is always the risk of slipping towards the worst case scenario given a lack of proper political commitment to transparency.

Unemployment constitutes the second largest best-worst difference. Although the unemployment rate is not the best indicator of labour market conditions, these results can definitely be regarded as a warning sign. Hungary has been doing well recently in lowering the unemployment rate, however the country still faces two great challenges concerning workers at the opposite ends of the labour force spectrum: creating jobs for the unskilled, and offering jobs with competitive wages to the best educated.

Policy implications

Figure 4 shows the possible outcomes of the worst, middle-of-the-road and best scenarios with the help of a Monte Carlo simulation. The spread of the different simulated scenario outcomes is between 0.98 and 1.2. In order to get closer to the higher end of the Figure 4 spread, the following areas should be in the focus of policy makers:

- Population growth. Several tax incentives (Bartha, 2014) have been introduced to boost the Hungarian birth rate, yet, despite all the effort there are no signs of improvement. Given the fact that earlier incentive policies had also failed to turn the trends

permanently, one can assume that such direct actions do not have a long-term effect on the birth rate. In such circumstances migration seems the only alternative, and a stricter immigration policy that was suggested by Hungary's prime minister in January 2015, will definitely not help in stopping the population drop.

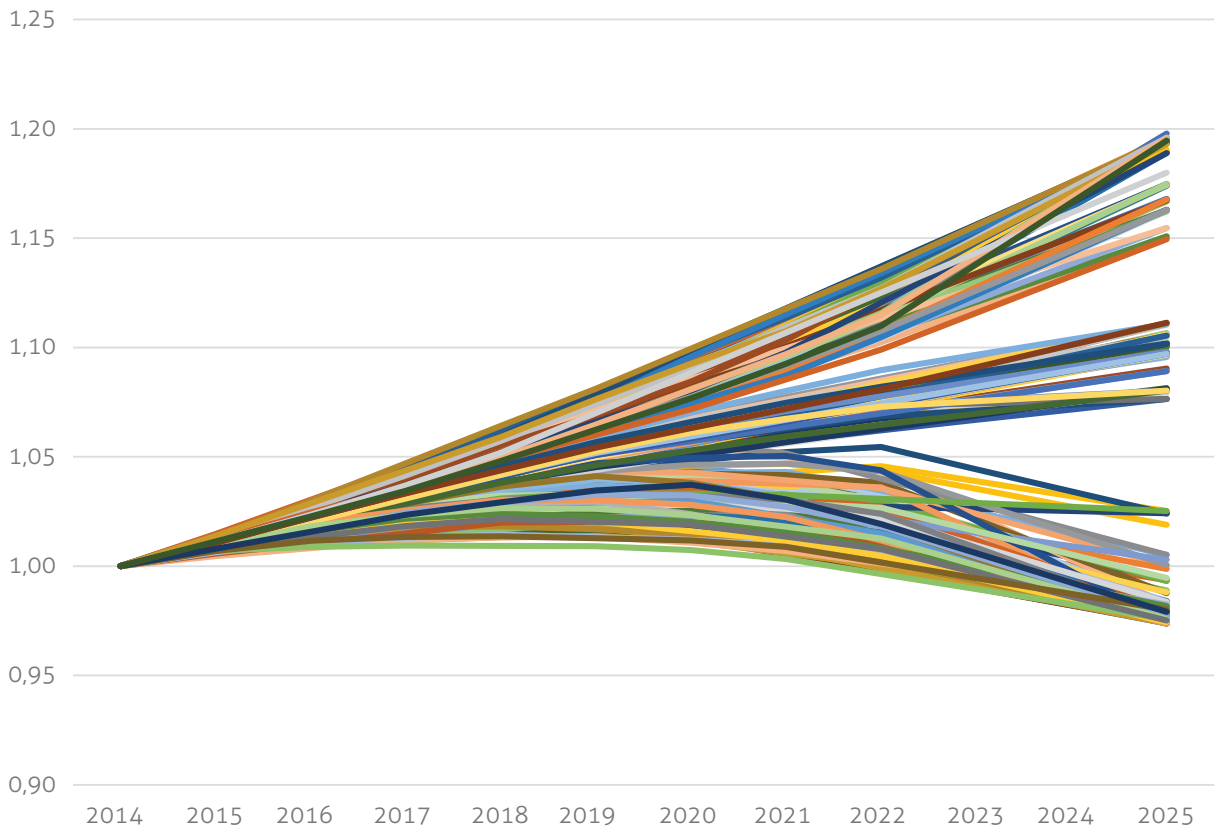

Figure 4. Monte Carlo simulated scenarios based on the RTD results (Source: own calculations)

- Life expectancy. Hungary has the lowest life expectancy among the Visegrad countries, and although it will continue to increase, the rate of improvement is very low. Life expectancy is a very complex indicator, and many factors influence it. Some of them are related to the traditions of the country: e.g. diet, or corruption, which means that patients are expected to pay extra illegal fees. When the latter is combined with long queues, and a non-friendly atmosphere, the result is patients only visiting doctors when it is too late, and so disease prevention cannot be conducted efficiently. The level of medical education (traditionally high in Hungary), and the competitive wages that keep the skilled labour force in the Hungarian health-care system also contribute to life expectancy.

Low life expectancy is connected with poverty: the residents of underdeveloped Hungarian micro-regions live 3-4 years less than those living in richer regions (Csite-Nemeth, 2007).

- Renewable energies. Although Hungary has a great geothermal energy potential, greater state commitment is needed, if we want to exploit it. Experience shows that pure market-based efforts alone cannot lead to dynamic development of the geothermal energy sector (Kis-Orloczki, 2014).

- Research & Development. The latest Hungarian strategy for higher education puts great emphasis on university-business cooperation (HG, 2014), which is a welcome shift in education policy. It is still unanswered, however, how basic research will be funded in the country.

- Government debt. Improvement in this field is almost guaranteed, because of the constitutional commitment to the 50% threshold in the debt/GDP ratio.

- Corruption. Quick improvement is very unlikely, however there is a clear danger that the levels of corruption might rise. A strong commitment to transparency at all levels of government is needed to sustain and slowly improve on the current level.

- Unemployment. The creation of jobs is especially important at the two ends of the labour force spectrum: for unskilled labour, and for highly educated people.

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5. SOFI Results: Poland

Norbert Kołos, Piotr Jutkiewicz

The SOFI "Baseline" for Poland is a result of taking into account the last 25 years of historic data (since 1995) and looking 10 years into the future, to 2025. The historic data has been obtained from various sources, as described in an earlier chapter. The future outlook is a result of both external analyses and our own extrapolations, but does not include the results of experts' opinions in a Real Time Delphi study, so there are no scenarios.

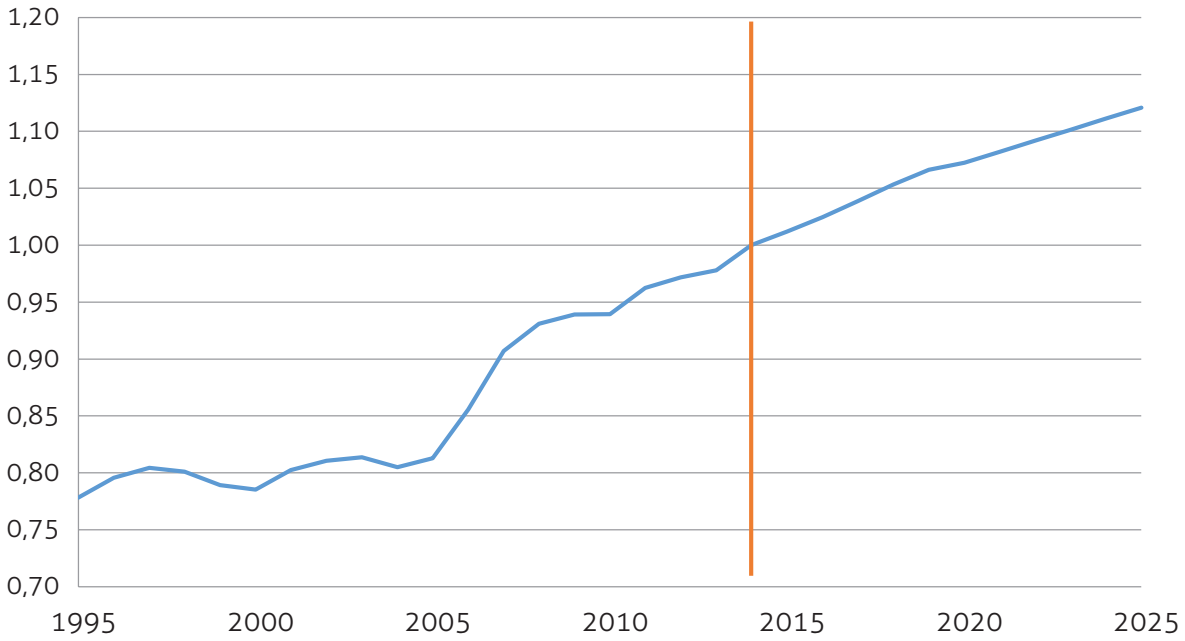

Figure 1 SOFI Baseline for Poland. 2014=1

For the first ten years – until 2005 – progress was slow to say the least. The biggest leap in SOFI value can be observed from 2005 until 2007-2008: an over 10% increase in the SOFI value over a relatively short time period. After this big leap, correlated strongly with Poland's first years in the European Union, progress continued at a slower, but steady pace of around 2% per year. As can be expected, SOFI baseline suggests a continuation of this trend, as it is based on predictions and forecasts which usually assume no discontinuities.

The Monte Carlo analysis of 250 scenarios, which are based on the results of a Real Time Delphi study regarding the probability of the increase or decrease of specific constituent variables of SOFI, has been illustrated in Figure 2 below.

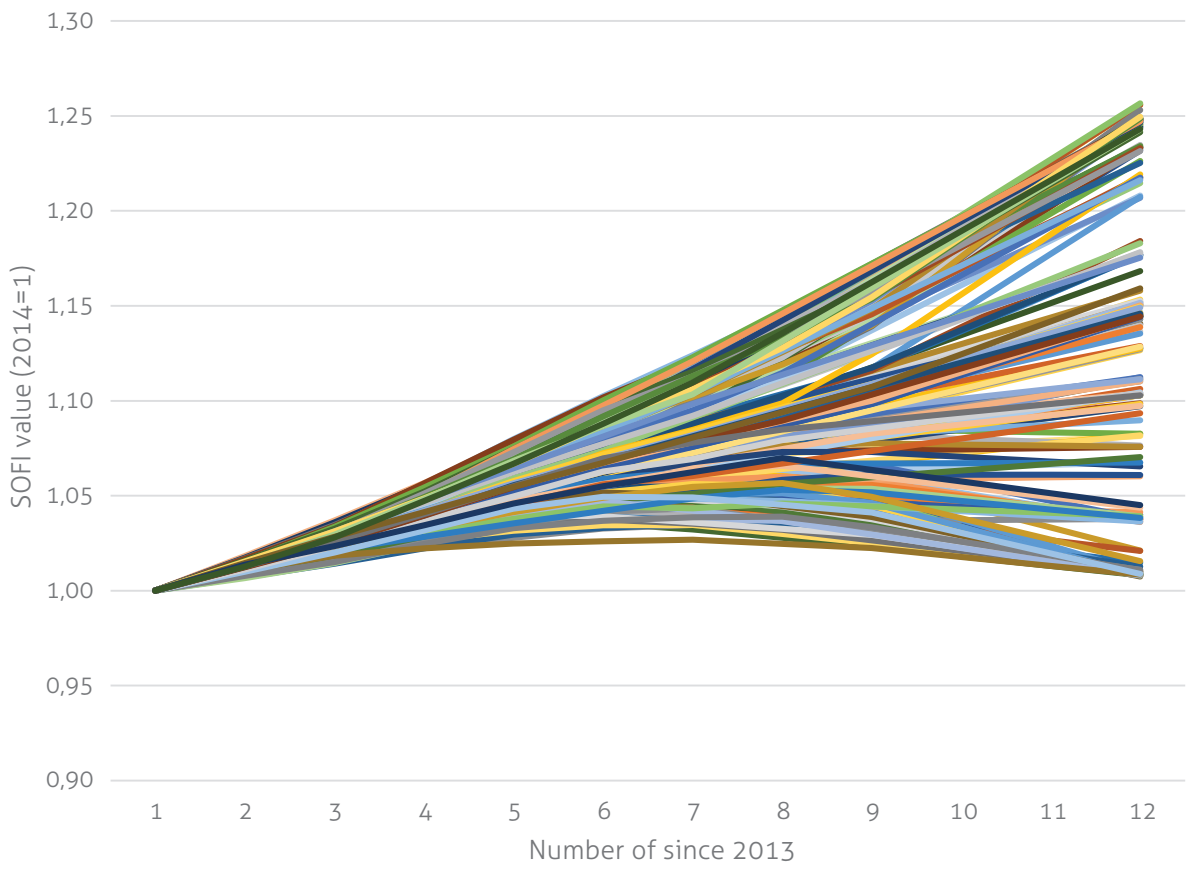

Figure 2 The results of Monte Carlo analysis for Poland: Simulated scenarios

The most important insight from the graph above is that, although the SOFI baseline looks relatively optimistic, there are still a lot of ways in which we can fail to make it a reality. In the most extreme scenarios, after a few years of the continuation of the current improving trend SOFI index decreases so that in the year 2025 Poland would be still in the same place as it was in 2014. Considering that the world would probably keep moving on, this is most definitely not a desirable situation. On the other hand, the Monte Carlo analysis shows that with a carefully planned strategy we can not only keep the current trend, but we can also speed up progress – in most optimistic scenarios reaching SOFI values 25% better than the present.

The identification of the biggest opportunities and threats has been done in the next stage. Figure 3 illustrates the most important areas in which we should work to improve. It shows how big is the deviation between the optimal value of a certain variable and its value predicted in the best, worst and middle (projected) scenario. It can be seen that some of the most important areas in which Poland should improve include, not surprisingly, variables concerning healthcare, equal rights, energy production, education and unemployment.

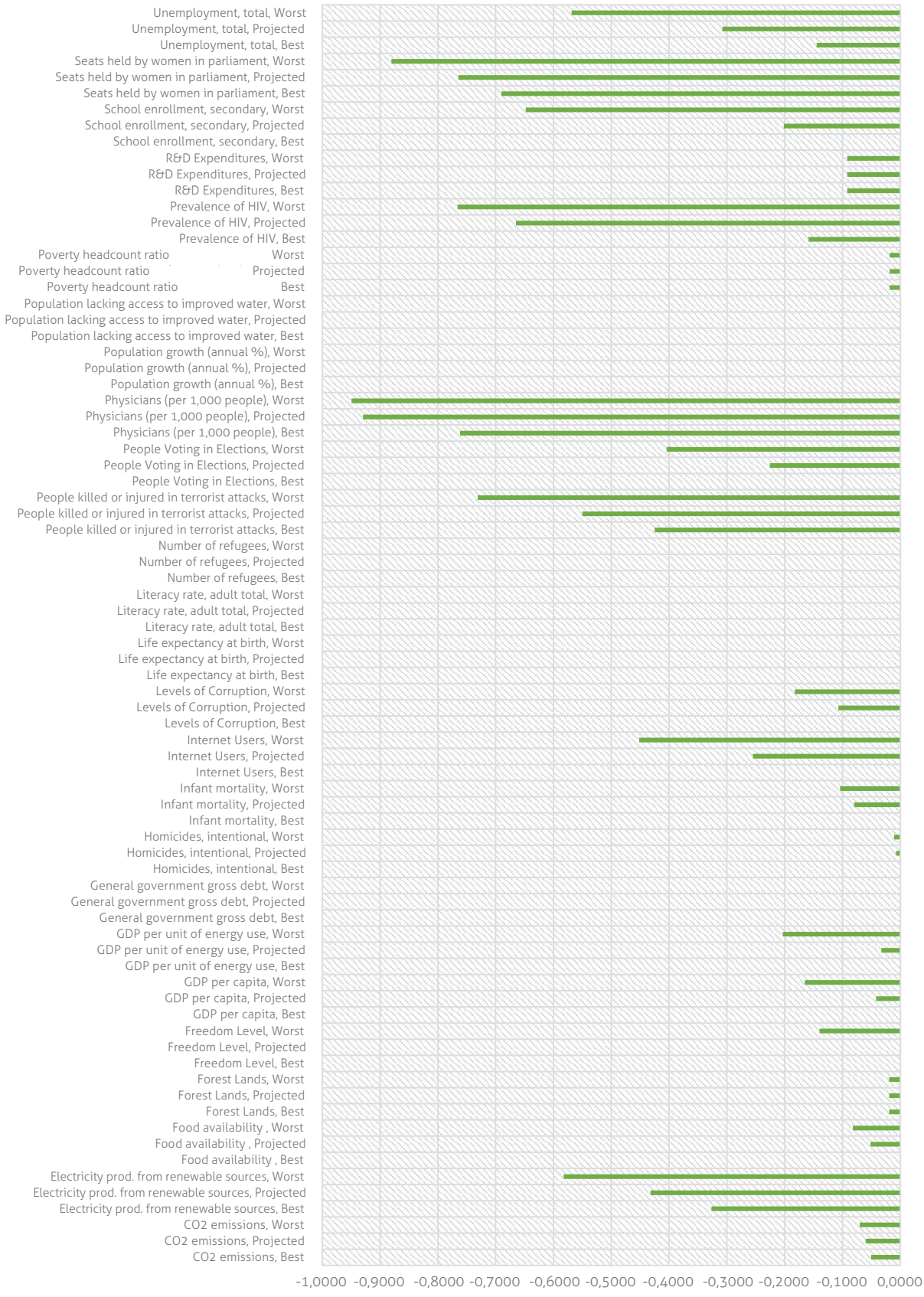

Figure 3 Standardized weighted deviation of a given scenario from SOFI max value

Another way to look at the areas in need of improvement is to consider them to be both risks and opportunities. Figure 4 below shows the standardized weighted differences between the worst and best case scenarios for all the SOFI constituent variables. In this way, it shows where we have the biggest chance for improvement, but also the biggest chance to miss an opportunity for a development boost.

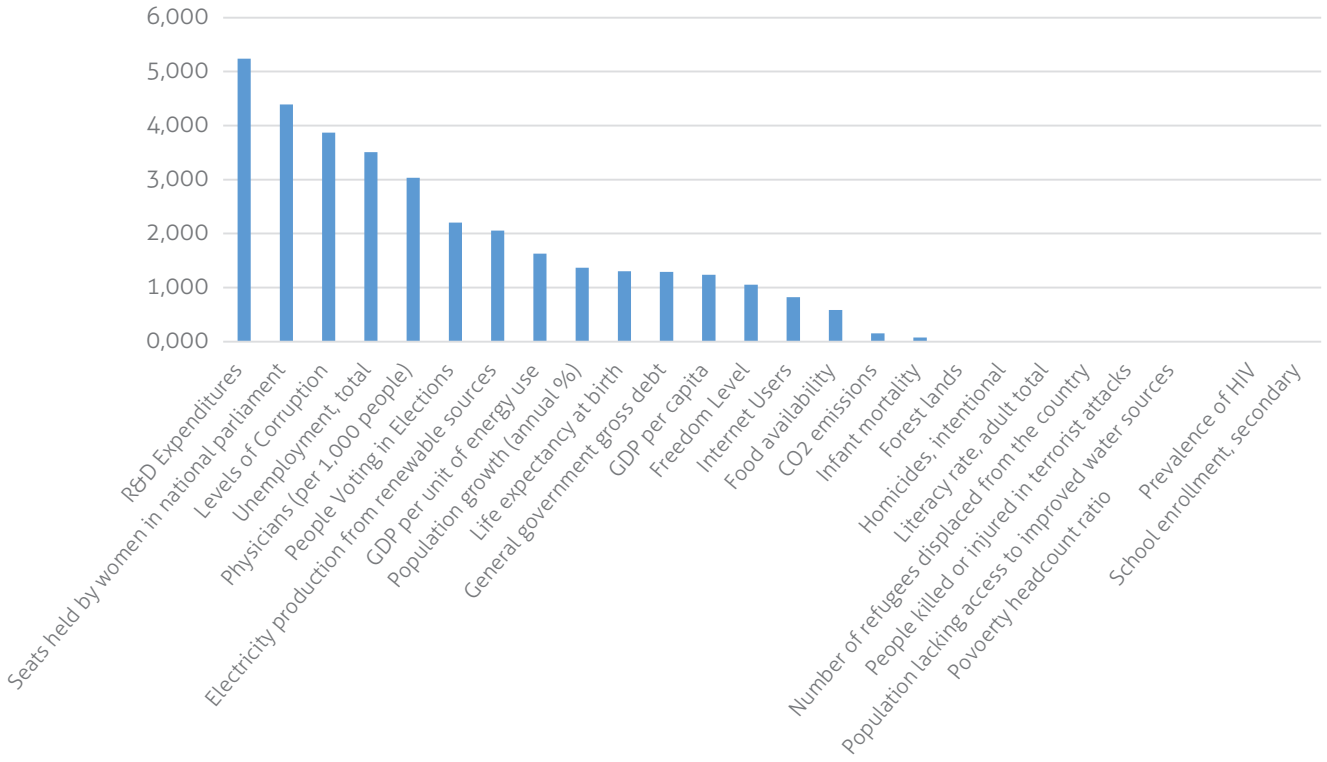

Figure 4 Standardized weighted differences between worst and best case scenario for a given variable

R&D expenditures is the most important of the challenges identified. It is currently at a relatively low level, which hinders Poland's development. This issue should not be neglected since it seems to be both the biggest opportunity to speed up progress and the biggest risk of holding it back. The best, middle and worst (projected) scenarios of R&D expenditures are shown in the graph below. It is a pressing matter which calls for immediate action since the projected value is not far from the worst one.

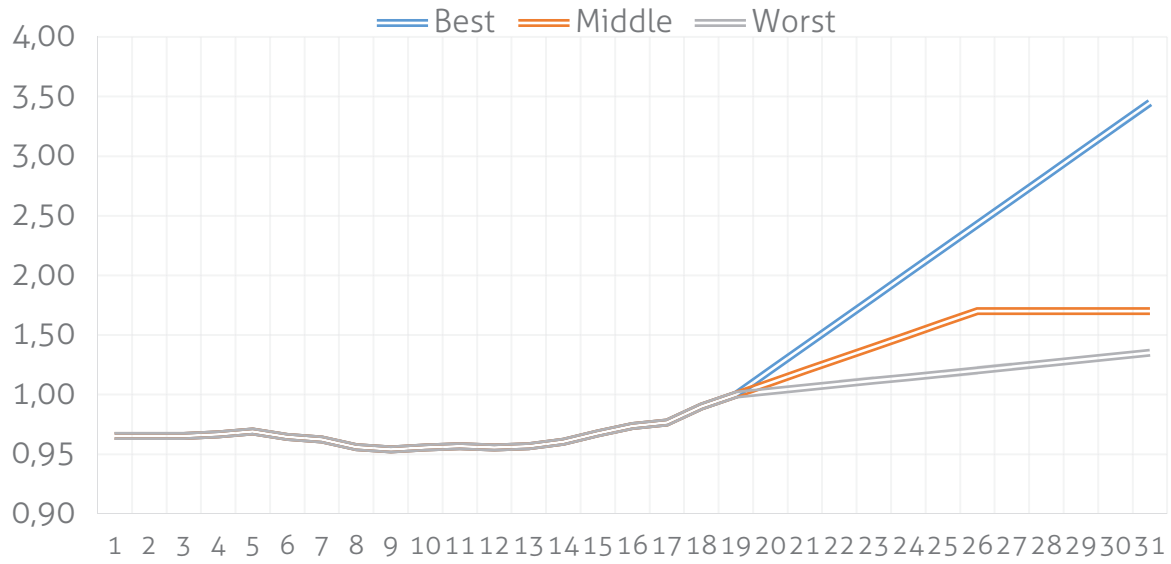

Figure 5 R&D Expenditures (percent of GDP) - Scenarios

A more in-depth analysis can be done for each of the variables, thus showing the strategic directions of future development. SOFI should be calculated on a regular, e.g. annual basis in order to track progress. A country report card can be prepared to better and monitor new opportunities and threats as they arise. This will be especially valuable when a country or Europe-specific set of variables is developed in the future. It is also worth mentioning that during the Real-Time Delphi study, for each of the variables, apart from the probabilities and values in various scenarios, a qualitative list of events and developments is put together. Those events and developments are vital to a successful creation and deployment of specific strategies and action plans for making the most desirable scenarios a reality. They will be further analyzed in later work which will also be focused on improving the methodology and developing a Europe-Focus SOFI, better applicable to all European countries.

6. SOFI Results: Czech Republic

Petr Kladivo, Pavel Nováček

Theory

So far, the State of the Future Index has been the only index that not only looks at the present but also tries to identify the development trends of selected variables (indicators). It was coined by Theodore J. Gordon, a researcher at the Millennium Project (currently the largest forecasting project in the world).

At the global level, the State of the Future Index is a statistical combination of 28 key indicators of the state of society, which shows whether the situation is going to improve or deteriorate. The SOFI is based on assessment (through repeated surveys) carried out by selected experts, who identify the issues and trends conditioning future development (with a time horizon of 10 years). As part of the surveys, experts estimate the weight of each indicator, as well as events that have not taken place yet but, if they do, will have a large impact (positive or negative) on the development of society (Gordon et al., 2011).

Based on the available data, the global SOFI was evaluated for the past 20 years, which allows for a plausible forecast of future trends over roughly the next 10 years. Although over the past two decades the total SOFI has improved, in the next decade this positive trend is likely to slow down. By constructing one aggregated index, we lose track of the development in individual sub-indicators. Even with the overall index improving, it may happen that one of the indicators will significantly deteriorate (e.g. an increase in terrorist attacks). It is therefore advisable to provide, not only the resulting index (designed at the global, national and local levels), but also the development of individual indicators. It is also important to pay attention to finding the most accurate and reliable data possible and to identify any possible changes in time.

Basic results (Czech SOFI baseline 1995-2025)

The curve which represents SOFI for the Czech Republic (see Fig. 1) by comparing it to 2014 (2014 = 100%) can be divided into several sub-parts. While the curve on the left of the graph (1995-2012) is static for all modelled scenarios of the future, it differs only minimally because it is based on real statistical data without predicting or estimating, so standardizing on the basis of the overall average and extreme values progress curve does not change so much.

Thus this part of the curve was subjected to detailed analysis and it was assessed which variables have the most significant effect on trend changing. The conclusion was simple: the left part of the curve can be divided into three stages, as shown in Fig. 1. The first stage, can be clearly identify as the period 1995-2002, the second stage from 2003 to 2008 and the last one for 2009-2013. The right part of the graph, starting with the red line (2014-2025), shows the index basing on our research, with respect to all the potential scenarios.

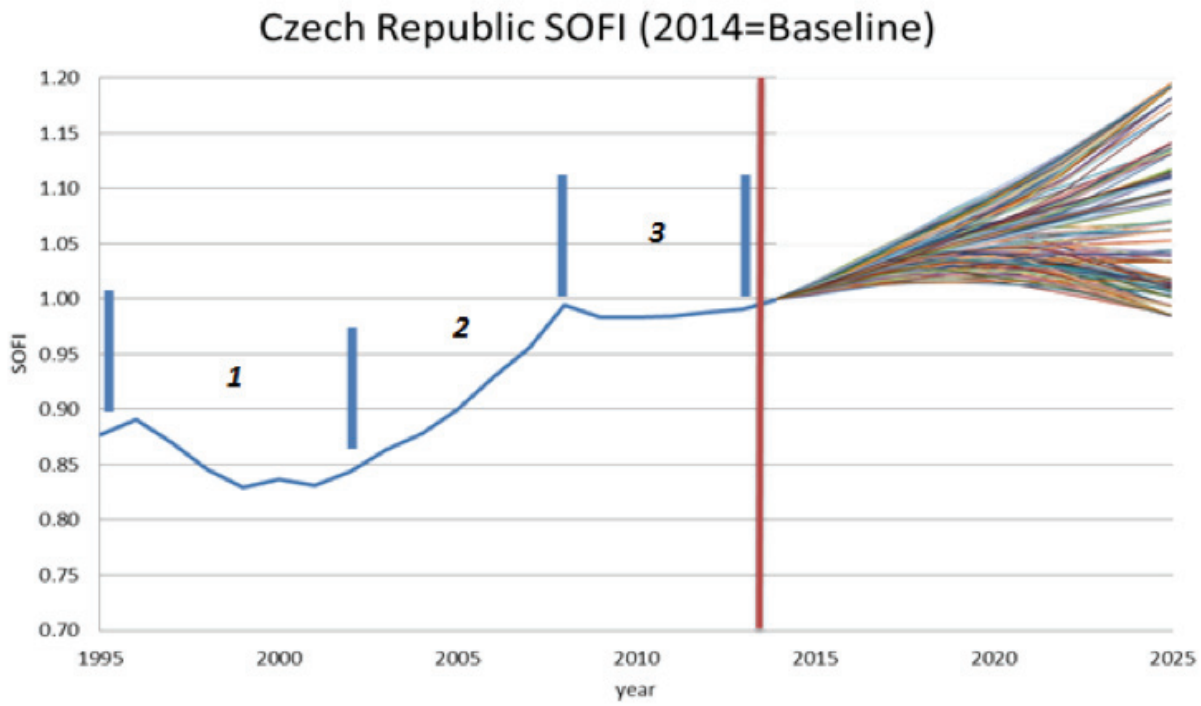

Fig. 1: SOFI curve for the Czech Republic.

Period 1995-2002:

Index values at this stage are virtually the lowest for the entire period 1995-2025. It is primarily due to the unfavourable values of environmental indicators which began to improve significantly in the mid-90s, yet their influence in this period was rather negative. From the beginning of the monitored period until 1999, air pollution in the Czech Republic recorded a sharp downward trend. This was most noticeable in the case of CO2, 311,000 tonnes of which were released in 1995; by 2000 the amount dropped to less than a half - 146,000 tonnes. At the same time, the percentage of energy obtained from renewable sources began to increase.

The second reason why the index is stagnating rather than growing during this period, are certain social characteristics, e.g. a decrease of citizens participating in elections, or a significantly increased proportion of the unemployed, etc. Along with social indicators some demographic characteristics also play an important role, particularly in connection with the so-called demographic transition typical for the Czech population in the 90s. Natural population change develops dynamically. Within the monitored period it is mainly determined by natality, as mortality (crude death rate) oscillated only minimally. Natality, expressed as crude birth rate, slumped since the early 1990s, from 12.5 (1990) to 8.8 (1996).

Period 2003-2007:

Mainly responsible for the relatively dynamic growth of the index in this period are economic and demographic indicators. The initial unfavorable development of the unemployment indicator negatively affected the economic SOFI. This is due both to the transformation of the economy, as

the transition of state enterprises into private ownership is beginning to show, and the worsened situation of the country in the late 1990s. The decline stops in 2000, with unemployment at 8.8%. In the following period, the unemployment development curve behaves erratically, but in 2004-2008 it falls sharply (to 4.4%), affecting the index very positively.

Natality, virtually constant until 2001, began to grow in 2002 thanks to the 1970s baby boomers, who reached their reproductive age, and mothers who had postponed childbirth in the nineties. By 2008 it peaked at 11.5, and later started to gradually decline; this trend is expected to continue with slight fluctuations until 2020. As the crude mortality rate ranges slightly above 10, the values of population growth were negative until 2005. At that point they became positive, and this trend should continue until 2020.

Period 2008-2012:

Between 2007 and 2009, the Czech Republic began to feel the growing economic crisis, which resulted in a drop in the economic SOFI. Its value fell from 1.15 to 1.07. Much of the decline was caused by an increase in unemployment and a decrease in GDP, as well as by a negative trend among indicators of lower weight, including demographic indicators (the positive trend in natality stopped, etc.). For trends of selected variables between 1995-2025 see Fig. 2.

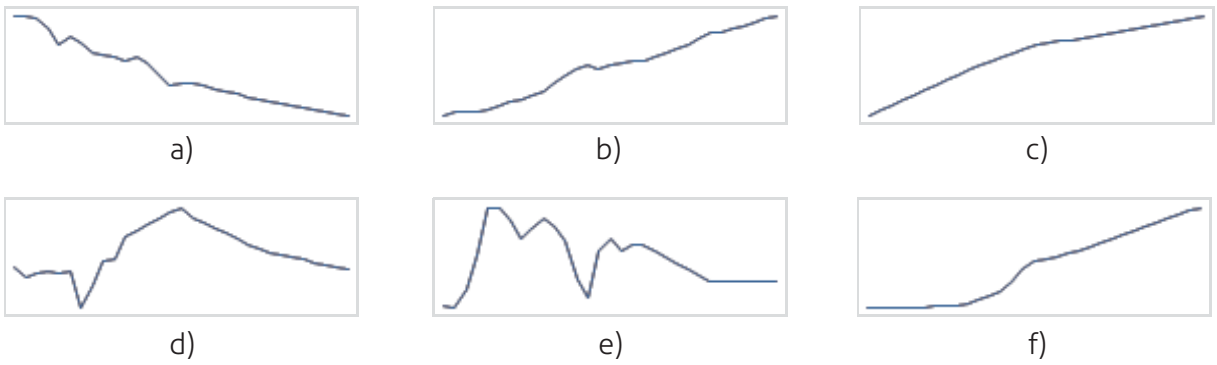

Fig. 2: Development of selected indicators: a) CO2 emissions b) GDP/cap. c) life expectancy (at birth), d) population development, e) unemployment rate, f) % energy from renewable sources

Discussion and conclusions

The total SOFI index is chiefly determined by environmental indicators in the early years (1995-1999), with a prevalence of negative effects (high values of emissions etc.). Thanks to large investments in the environment and a sharp drop in emissions in the second part of 1990s, the situation improved. As a result, the overall SOFI grows relatively dynamically, thanks also to the improvement of most economic, social and demographic indicators. The index stagnates in the 2007-2011 period, as most of the indicators mirror the consequences of the economic recession and the positive demographic trends slow down.

The authors' previous research, which was focused on SOFI calculation based on specific indicators for the Czech Republic (rather than global characteristics) revealed similar results and

conclusions. Combining a wide range of variables, the State of the Future Index is designed to indicate whether we should expect favourable or unfavourable developments in the future. Based on our results (see Fig. 3) it is clear that, in the case of the Czech Republic, the changes will be rather positive, even if much slower than at the turn of the 21st century.

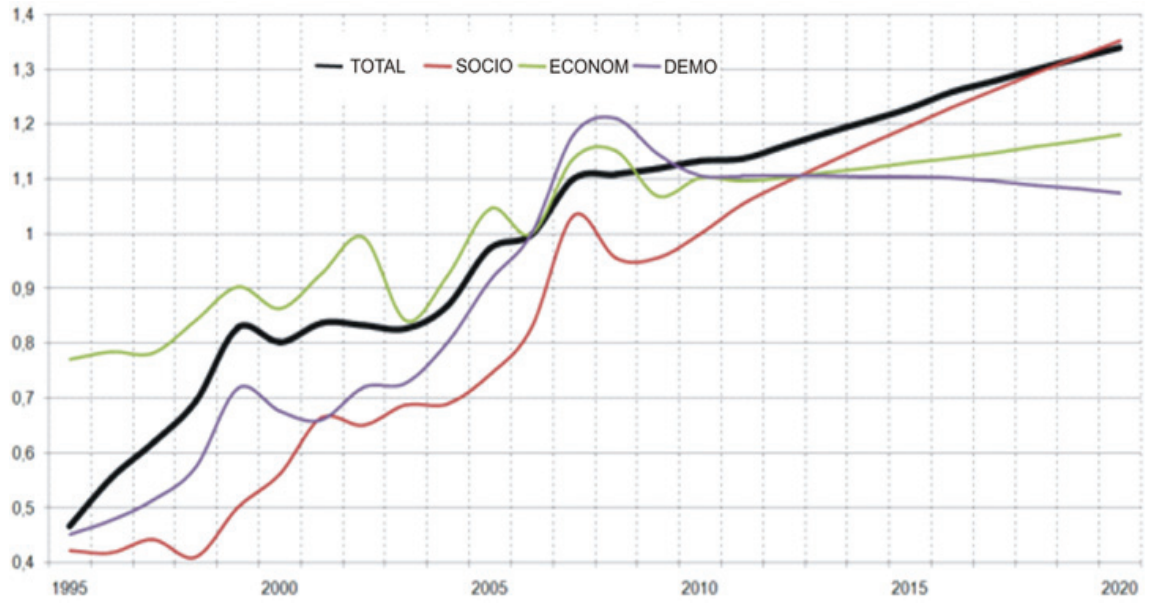

Fig. 3: SOFI's total and partial calculated from the specific variables (Kladivo et al. 2014)

Further research might require a discussion as to the selection of variables. The model would need adaptation, so that the variables would have a greater significance when it comes to the Czech Republic (or V4 countries) than the variables employed for the global SOFI. Another possibility is a specialization of the index and a narrowing of variables to those dealing with health or education so as to better evaluate the readiness of regions or countries for further development.

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7. SOFI Results: Slovakia

Ivan Klinec

Historic SOFI: Slovakia

SOFI was calculated for Slovakia from 1995 to 2014 and projected from 2015 to 2025. The value of SOFI in the year 2014 is 1. SOFI starts from 0.87 in 1995, reaches 0.90, following two years of growth, in 1997 and later decreases to 0.82 in 2000. There is stagnation in 2001 and slow growth to 1.01 in 2008, the initial year of the global economic crisis. From 2008 there is a slow decrease from 1.01 to 0.98, the latter value being reached in 2010, what follows are two years of stagnation on 0.98, and an additional three years of stagnation on 1.00 in the years 2012 to 2014. The decline which began in 2008 was caused by the economic problems of the Slovak Republic, especially the very high unemployment rates and very low expenditures on Research and Development. All of the above were also connected with the beginning of global economic crisis.

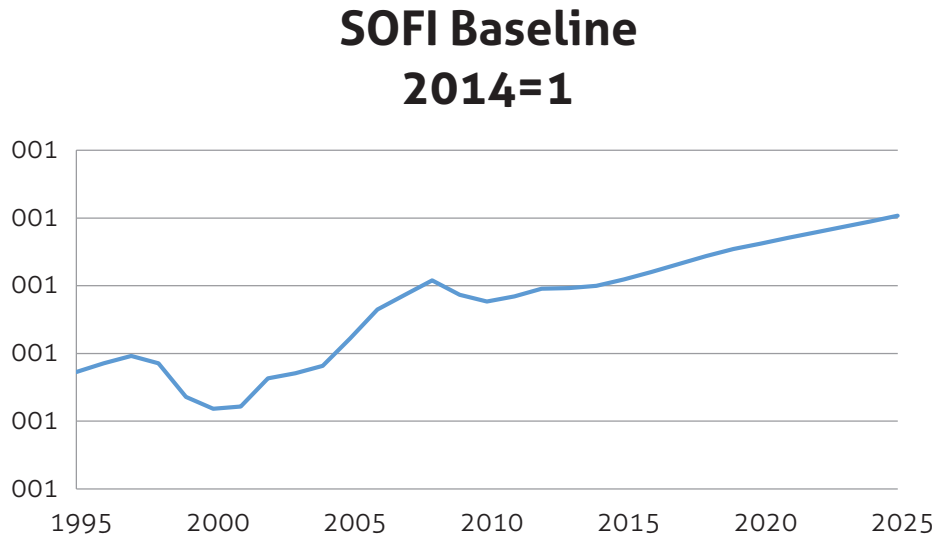


Figure 1. SOFI Baseline for Slovakia (source: V4 SOFI Project calculations)

Projected SOFI: Slovakia

The projected SOFI value shows slow growth from 1.01 in 2015 to 1.10 in 2024 and stagnation on 1.10 in 2025. We can expect slow progress, which will be vulnerable to turbulences in world economy and also to changes in Slovak economic policy. The potential negative impact on the progress of SOFI would be attributed to the fixed industrial structure of Slovak economy and the long-term problem of high unemployment rates combined with the absence of an adequate policy which would address the latter issue. High levels of corruption can also be dangerous, as can be a very high general government gross debt and very low R & D expenditures.

SOFI variables

SOFI was calculated for a selected set of variables, basing on historical data from 1995 to 2014. Historical SOFI variables show us the weak and potentially problematic areas in the future development of Slovak economy and society towards 2025. The most problematic aspects within the period 1995-2014 are levels of corruption, people voting in elections (percent of national population of voting age), physicians per 1,000 people, population growth, research and development expenditures, unemployment and general government gross debt as percentage share of GDP. The development in other areas is steady, with no negative impact on calculated or projected SOFI. The causes of the problematic development in the areas listed above are mainly connected to the transition process of Slovak economy and they are as follows:

- Very high levels of corruption are connected with the democratic transition of the political and legal system in Slovakia and the negative heritage of the communist system. This entails differences from the legal frameworks of mature democracies.

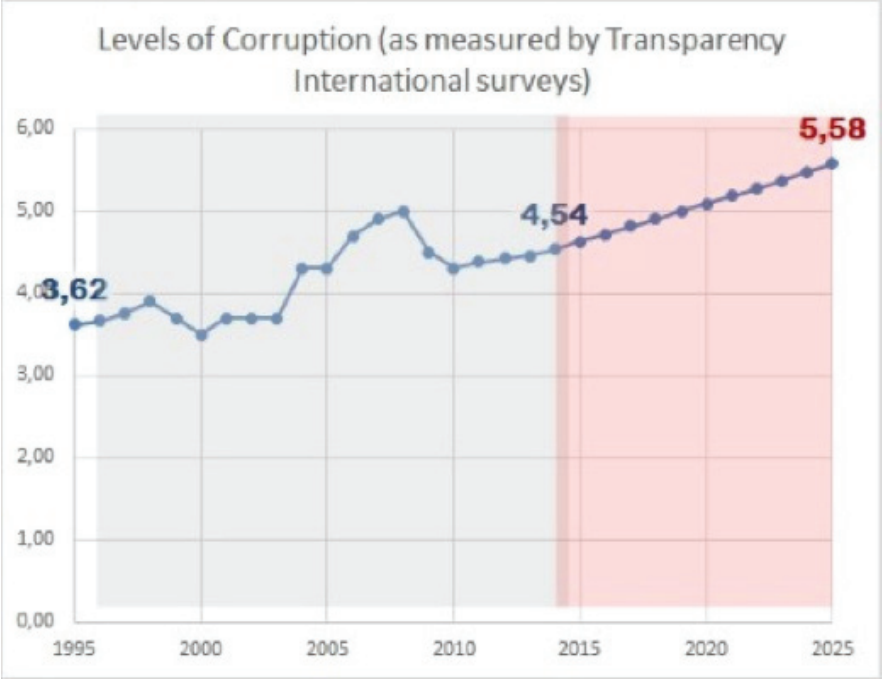


Figure 2. Levels of Corruption (source: V4 SOFI Project calculations)

- A decrease in the number of people voting in elections (depicted as percentage of national population of voting age) is caused by the disappointment of citizens with the negative aspects of the transition process, such as very low wages, high levels of corruption, high unemployment and the absence of adequate policies to overcome these problems.

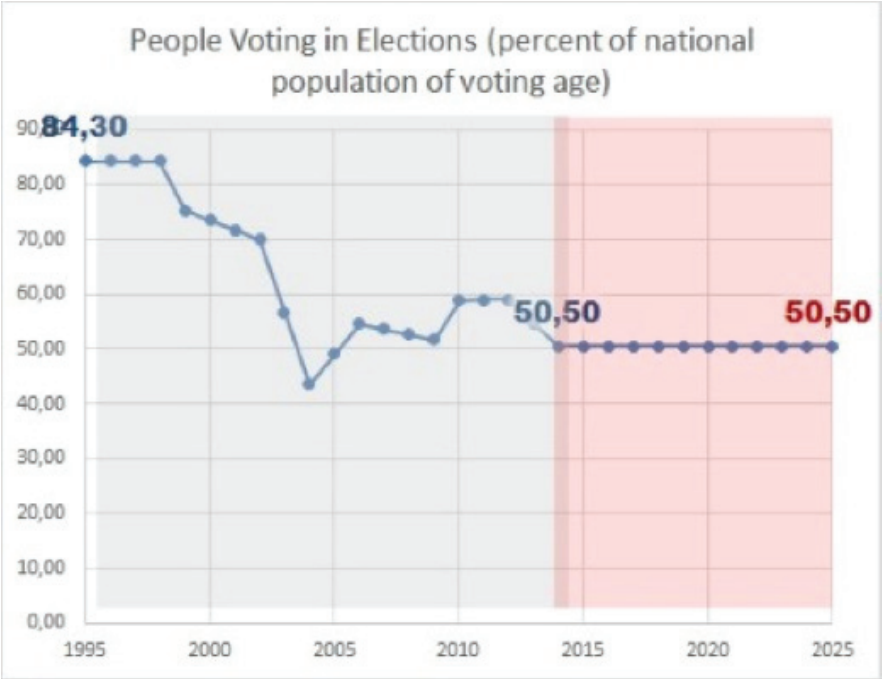


Figure 3. People Voting in Elections (source: V4 SOFI Project calculations)

- The decreasing number of physicians per 1,000 people is connected with the partial transformation of the health-care system, lower wages and inferior conditions in comparison to mature countries.

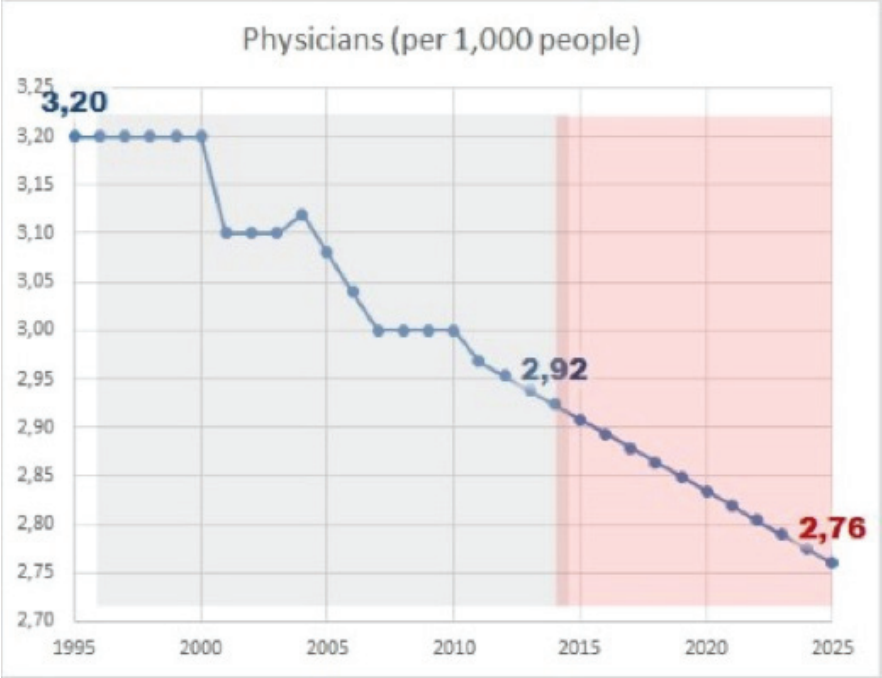


Figure 4. Physicians per 1.000 people (source: V4 SOFI Project calculations)

- The drop in population growth is connected with very low fertility rates and the negative impact of the transition process.

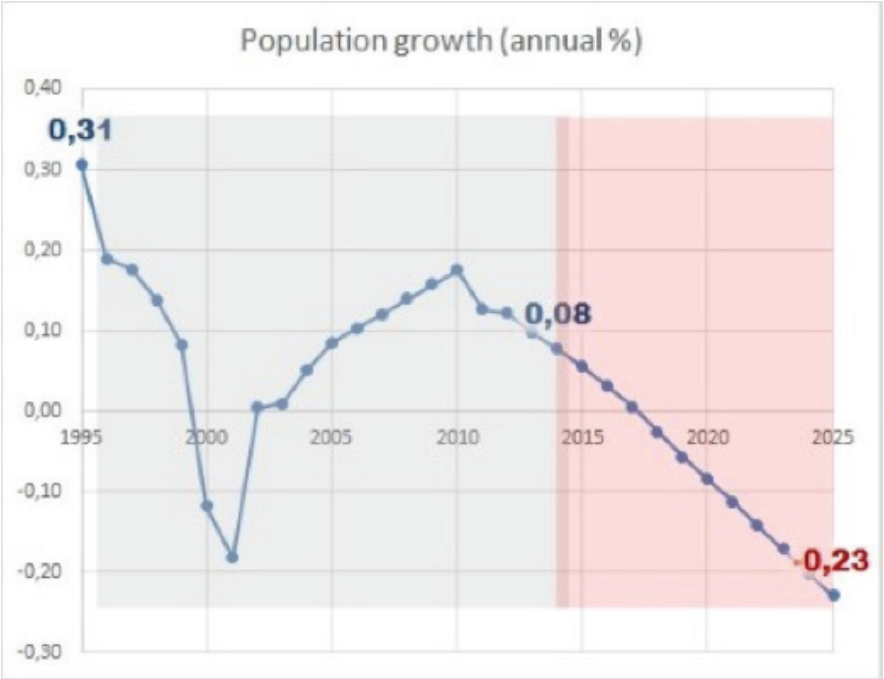


Figure 5. Population growth (source: V4 SOFI Project calculations)

- The very low level of R & D expenditures (as percentage of GDP) is caused by the priorities of Slovak economic policy oriented towards supporting the industrial sector (mainly the automotive industry) and the absence of a policy for the development of knowledge economy in Slovakia.

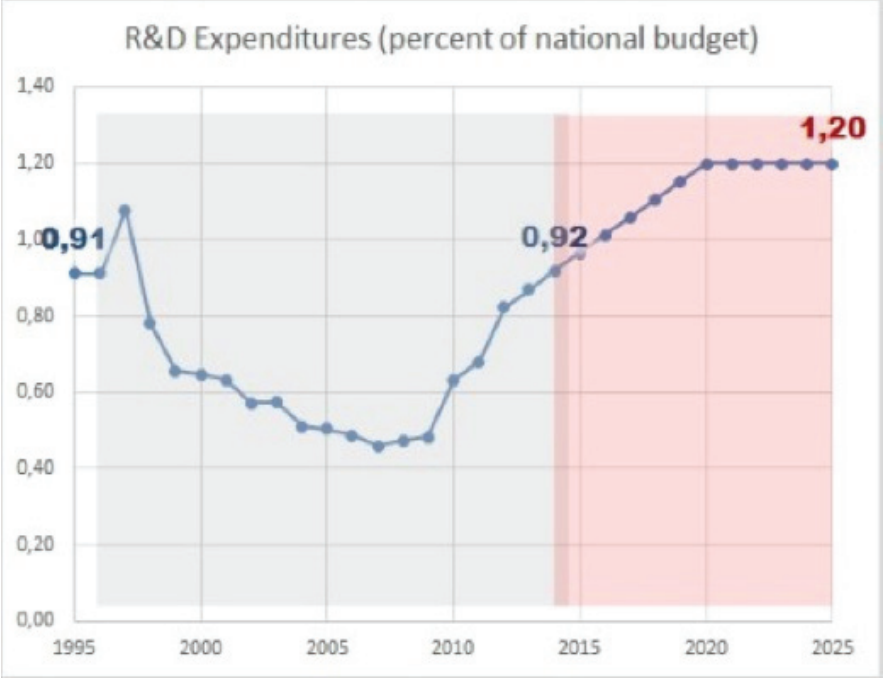


Figure 6. R & D Expenditures (source: V4 SOFI Project calculations)

- Very high unemployment is a long-term problem faced by Slovakia and is caused by the

specifics of Slovak economic transition and by focusing on the industrial sector as the main priority while neglecting knowledge economy.

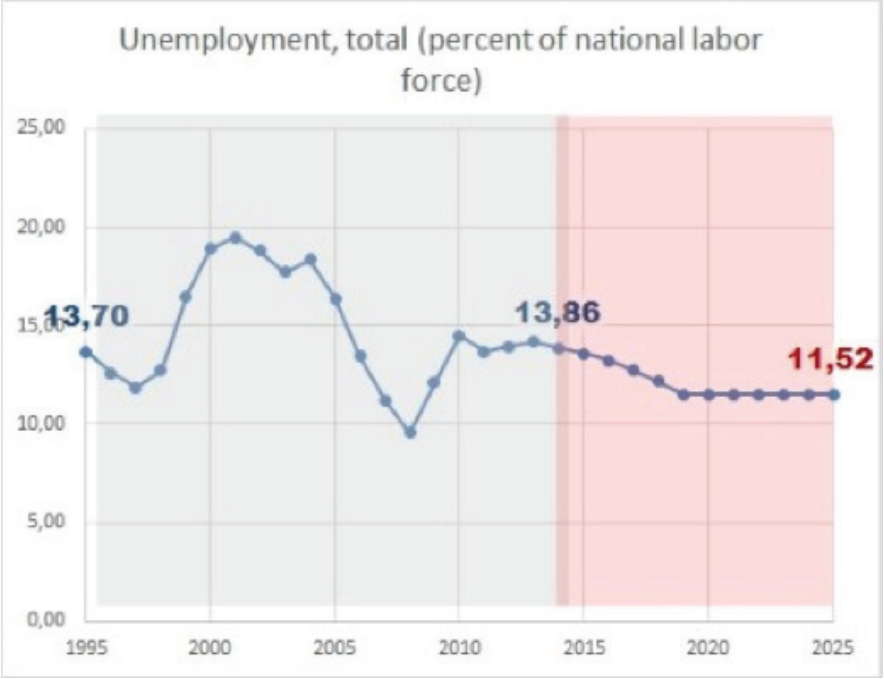


Figure 7. Unemployment total as percent of national labor force (source: V4 SOFI Project calculations)

- The growth of general government gross debt (as percentage share of GDP) is caused by the low competitiveness of Slovak economy and very weak feedback within the process of the realization of economic policy.

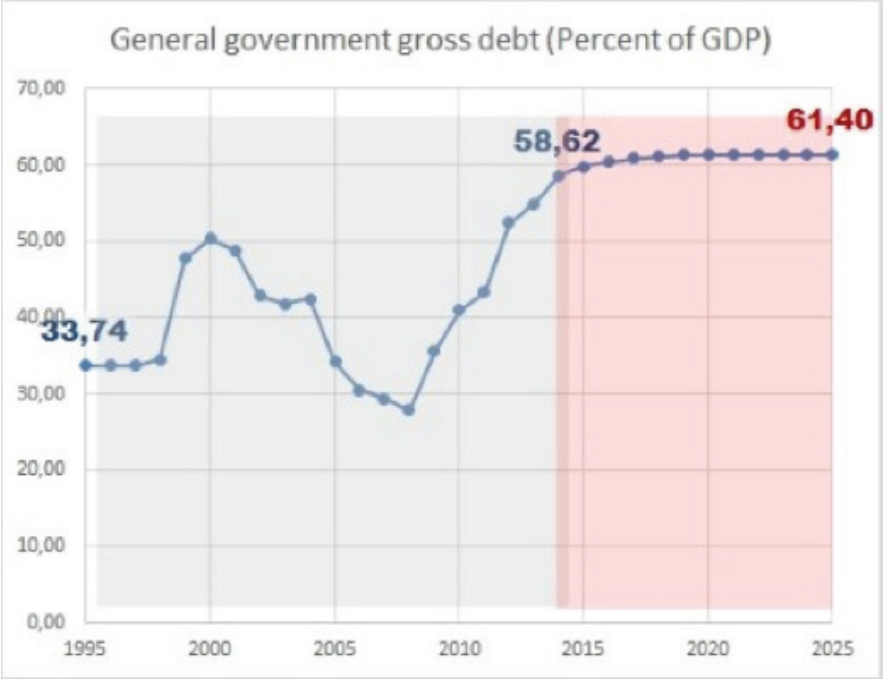


Figure 8. General government gross debt as percentage share of GDP (source: V4 SOFI Project calculations)

Real-time Delphi SOFI

As part of the SOFI analysis a Real-time Delphi study was conducted with the goal of projected variables being assessed by Slovak experts. Ten experts participated in the Real-time Delphi, and, according to them, we can expect the biggest risks and opportunities in the following areas:

- GDP per unit of energy use
- Levels of corruption
- Total unemployment
- General government gross debt

Policy implications

The assessment of historic and projected SOFI and also of individual variables indicates the following policy implications which might accelerate the progress of SOFI for Slovakia:

- Research and development expenditures can be raised to a higher level by the creation of policies supporting the development of knowledge economy in Slovakia, the declaration of Research and Development as top priorities of economic policy would also be required.
- The growing levels of corruption can be decreased by policies of transparency and by the improvement of the legislative process and a legal framework with the built-in function of feedback.
- The High unemployment rate can be resolved by a shift of policy priorities from the industrial sector towards education, science, research and development.
- The decreasing number of people voting in elections can be resolved by the improvement of policies (especially economic policy) and by making the democracy more genuine.

8. SOFI V4 and future research possibilities

Piotr Jutkiewicz, Kacper Nosarzewski

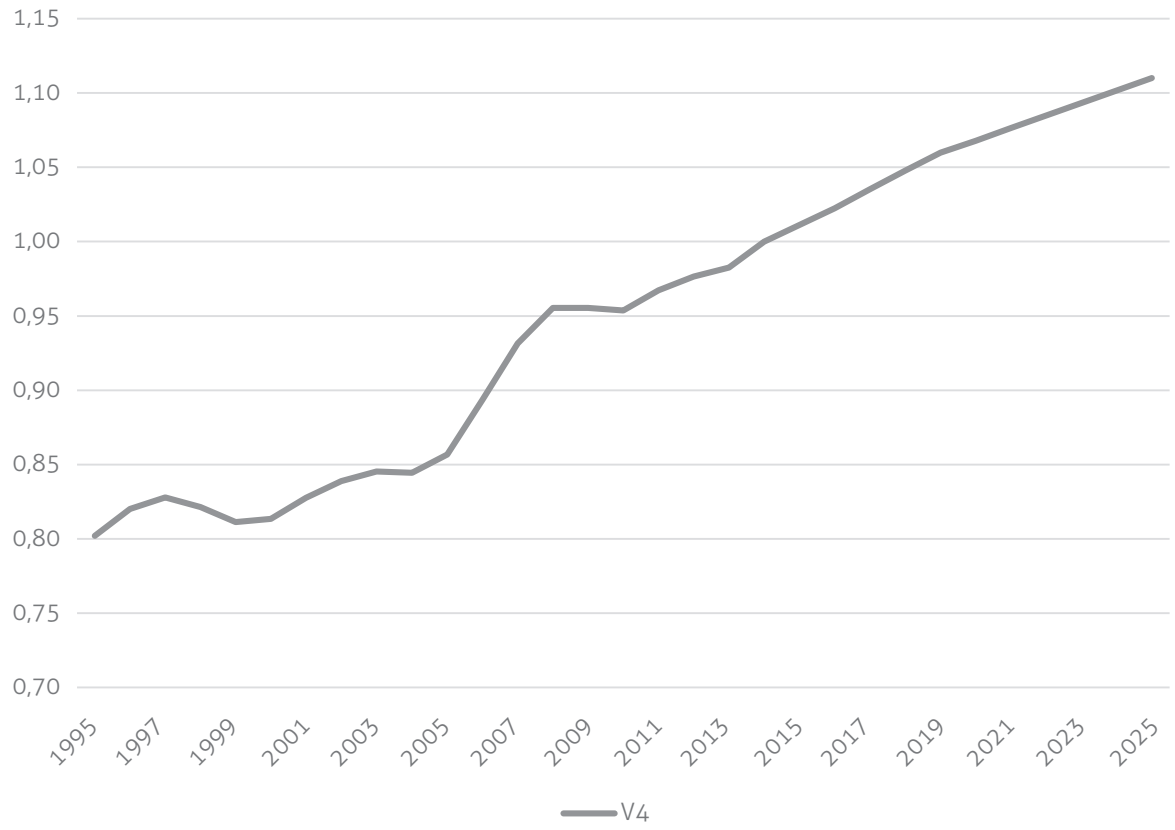


Figure 1: SOFI Baseline for the Viesgrad Group. 2014=1

SOFI baseline for the Visegrad group is a mean calculated from the results of particular countries. In order to account for the differences in size, population and GDP of the countries, weighted means were also calculated but since they did not bring substantial differences, a simple mean is presented. The next graph represents all of the countries' baselines. It can clearly be seen that even though the countries have travelled diverse routes, as a result of common future challenges they have very similar SOFI outlooks for the next 10 years. This shows how important it is for V4 to coordinate efforts and better confront the common challenges which lie ahead.

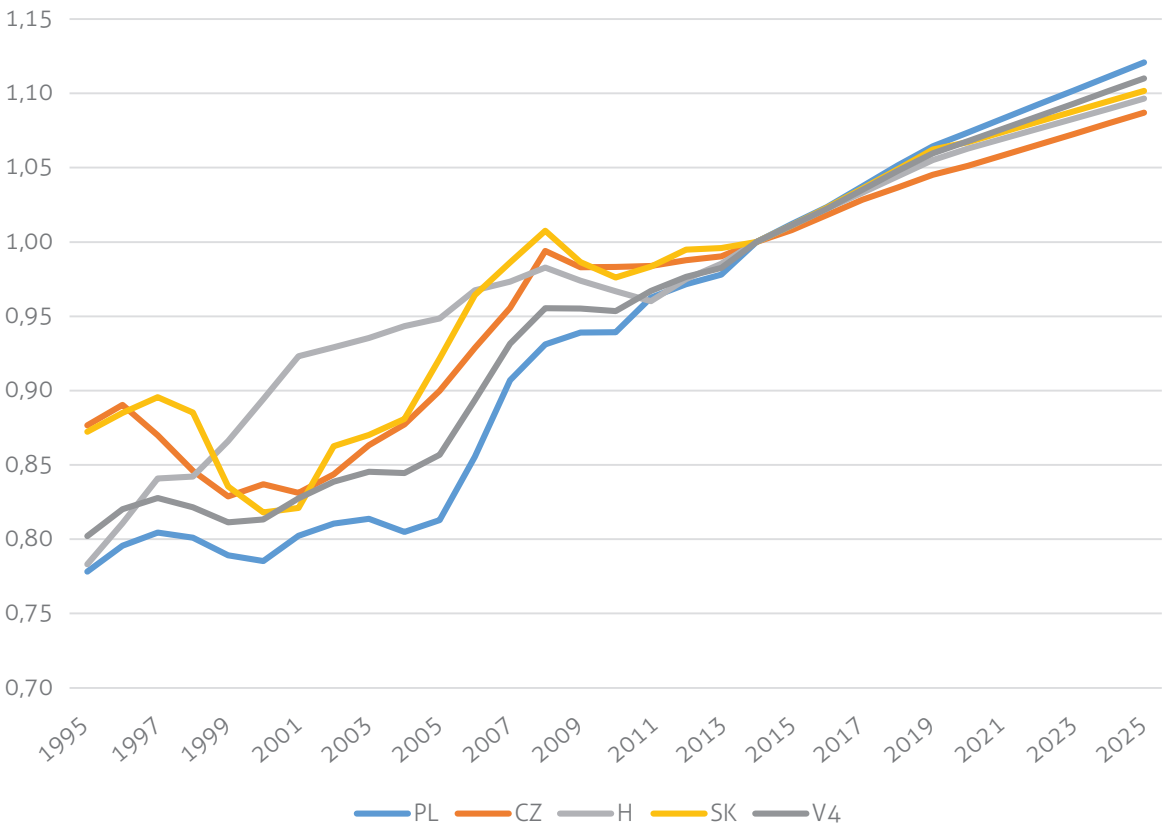


Figure 2: SOFI Baselines for the Czech Republic, Hungary, Poland and Slovakia, as well as the mean baseline for the whole Visegrad Group.

Our ambition is to continue this project and to develop the SOFI methodology further. Basing on the experiences from calculating the National Comparison SOFIs for the V4 countries, we would like to develop National Focus SOFIs (with a region-specific set of variables), preferably not only for V4 countries, but also for Central-Eastern or entire Europe, in order to be able to maintain comparability between multiple countries.

Apart from the issues mentioned in the chapter describing our methodological approach (like the thousands of fields to be assessed in the TIA method or the linear probability increase), we see some additional challenges, which could be tackled in further research. We list them below for the convenience of the reader and to inspire new projects, synergic to the attempted SOFI calculation.

Firstly, SOFI is an index focused on the speed of development of a given country. This means that a country with a relatively low development level can achieve better values of the index simply because it is easier to develop faster when you're starting from a lower level. This is not a shortcoming of the index, rather one of its characteristics. However, to make the index more useful, it is worth considering whether the index could be utilised to assess the future levels of development, not only its speed.

Secondly, the weight system, which balances the relative importance of specific variables, could be more advanced. It should take into account the fact that some variables have an optimal value, which means that the aggregate index should be worsened by the values of this variable both

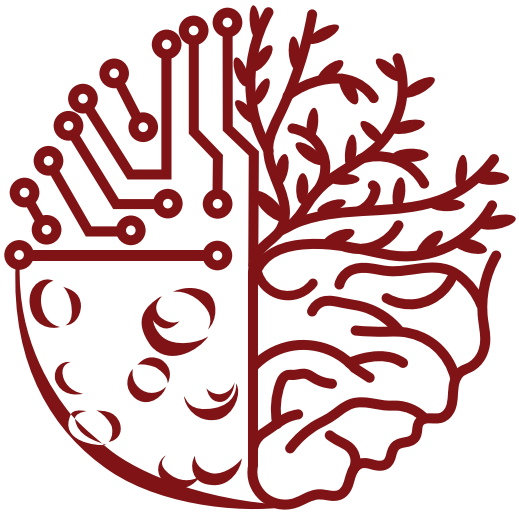
lower and higher than this sweet-point. Furthermore, the weights could be adjusted depending on the actual value of the variable in a given country to address the fact that a low value in the case of some variables is a far more dramatic problem than in the others.

Thirdly, the current index mixes all sorts of variables, thus resulting in the possibility to compensate for a very high infant mortality rate with a very high level of internet access in a population. The development of sub-SOFIs could be considered, with groups of variables either concentrated on specific areas of development or on the more- and less-basic development needs. Such an approach has already been attempted in the Czech Republic, with promising results. The sub-indexes could easily be aggregated to the usual SOFI, at the same time providing valuable insights regarding the progress in various areas.

Such improvements could make the SOFI index an even more applicable and attractive proposition in times when GDP is no longer considered the magic-bullet indicator (http://www.oecdobserver.org/news/archivestory.php/aid/1518/) and different development indexes contribute to a better picture of development in the World (like the UNDP Human Development Index and Australian Bureau of Statistics Socio-Economic Indexes for Areas referred to as SEIFA). Experimentation in this field is encouraged both to inspire critical analyses of policies optimized for the existing indexes and to avoid over-confidence in measures that do not capture the complexity of development to the satisfactory extent.

Today and in the future, GDP is a beacon, but it is not the only one. The widespread use of SOFI could add very valuable new insights which could help both V4 countries and other nations all around the world to better track their progress and identify possibilities and threats influencing their future well-being.

9. Project Partners



Polish Society for Futures Studies

Poland
Project Leader
V4 SOFI Coordinator: Piotr Jutkiewicz

The Polish Society for Futures Studies (Polskie Towarzystwo Studiów nad Przyszłością) conducts research and promotional activities in the area of foresight and strategic planning. We are a registered association since 2011 and are affiliated with the Polish node of The Millennium Project.

Members of the association represent a wide variety of specializations, including engineers, economists and managers who contribute their time and expertise to the development of futures studies in Poland and abroad. Thanks to grants from the International Visegrad Fund, the Stefan Batory Foundation and the support of other organizations, we implement projects on an international scale. We cooperate with UNESCO in the development of tools for planning, foresight and deliberative processes of decision-making. Our members participate in activities and conferences around the World developing the knowledge for "using the future" in various fields, both in the private and public sectors.

We are also undertaking a number of outreach projects (including commentaries and journalism), which introduce public issues of foresight and strategy, including the responsible shaping of public policies and decision-making processes with regard to their long-term consequences and sustainable development.

For the purpose of further popularization of futures studies and public outreach, we're running an internet portal on www.PTSP.pl with some of our text being reprinted by the most influential Polish media.

The Millenium Project

International Think Tank.
HQ in Washington, D.C.
Coordinator: Jerome C. Glenn

The Millennium Project connects futurists around the world to improve global foresight. It was founded in 1996 after a three-year feasibility study with the United Nations University, Smithsonian Institution, Futures Group International, and the American Council for the UNU. It is now an independent non-profit global participatory futures research think tank of futurists, scholars, business planners, and policy makers who work for international organizations, governments, corporations, NGOs, and universities. The Millennium Project manages a coherent and cumulative process that collects and assesses judgments from over 3,500 people since the beginning of the project, selected by its 50 Nodes around the world. The work is distilled in the annual "State of the Future", "Futures Research Methodology" series, special studies, and integrated into its Global Futures Intelligence System.

http://www.millennium-project.org/

4CF Strategic Foresight

Poland
Coordinator: Norbert Kołos

4CF is a strategic foresight consultancy. Our core expertise lies in long term analysis and strategy - helping businesses, NGOs and governments to reach their goals in the rapidly changing environment. We increase organizations' and teams' capacity to identify, prepare for and utilize opportunities and threats. 4CF stays on the cutting edge of modern foresight, working with i.a. military strategists, in order to give our clients the advantage of always being one step ahead. Uniquely positioned on the dynamic Polish market and operating on four continents, 4CF fosters a culture of quality foresight in the Central European region, advising both local and overseas investors, managers, and policy-makers. Our reports, analyses, and workshops have an important impact on public debate, shaping the future to meet our client's ambitions.

http://4cf.pl/

Univerzita Palackeho v Olomouci

Czech Republic
V4 SOFI Coordinators: Pert Kladivo,
Pavel Novacek

Palacký University, established in 1573, is one of the leading centres of teaching and research in the Czech Republic. It comprises eight faculties at the present time and offers degrees in a wide range of disciplines, including medicine and other natural sciences, humanities, social sciences, as well as legal education. Since the collapse of communism in 1989 Palacký University has been enjoying an era of development and growth. In the recent years, one of the highest priorities of the University is to strengthen international cooperation with other higher education institutions. Approximately 1 700 foreign students study at the Palacký University nowadays.

http://www.upol.cz/

Enterprise Theory and Practice Doctoral School

Faculty of Economics, University of MIskolc

Hungary
V4 SOFI Coordinators: Zoltan Bartha,
Klara Szita Toth

The Enterprise Theory and Practice Doctoral School was founded in 2001, but the doctoral programme on which it was based was started in 1992. Over 70 PhD degrees have been issued since the start, and as of today, it has around 50 PhD students studying at either the Hungarian or the English line of studies. Research topics concerning the regional and macroeconomic environment, and the business practices of the enterprises form the the backbone of the Doctoral School.

http://gtk.uni-miskolc.hu/doktoriiskola/about

Institute of Economic Research, SAS

Slovakia
V4 SOFI Coordinator: Ivan Klinec

The Institute of Economic Research belongs to one of the institutes established right after the creation of the Slovak Academy of Sciences in 1953. In recent years the Institute has undertaken national-economy oriented research which focuses on finding answers as to the state, functioning, and directions of the Slovak economy. The research also encompasses the utilization and cultivation of the country's potential, finding ways and resources that minimize risks and threats to Slovakia's development during the completion of the transformation process in the context of globalization and integration. The Institute's research integrates theory with empirical tools. The Institute's current research activities address the following areas:

- Globalization, integration and adaptation processes in the world economy in general and European economies in particular.
- Processes and policies affecting the social-economic development of Slovakia and its regions.
- Macroeconomic policies in relation to stability and macroeconomic growth in the national and regional context.
- Processes and policies that foster knowledge-based economy.
- Relationship between economic policy of the state and the development of the business sector.
- Economic processes with applications of mathematical economics and econometrics.

The main results of the Institute's research are shared with professional bodies as well as the broader public through various forms of editorial activities and offers relevant results to government bodies. The Institute also trains doctoral students in the field of Economic Theory.

http://www.ekonom.sav.sk/en

Project funded by:

The International Visegrad Fund is an international organization based in Bratislava founded by the governments of the Visegrad Group (V4) countries—the Czech Republic, Hungary, the Republic of Poland, and the Slovak Republic—in Štiřín, Czech Republic, on June 9, 2000.

The purpose of the fund is to facilitate and promote the development of closer cooperation among citizens and institutions in the region as well as between the V4 region and other countries, especially the Western Balkans and countries of the Eastern Partnership. The fund does so through grant support of common cultural, scientific and educational projects, youth exchanges, cross-border projects and tourism promotion, and through individual mobility programs (scholarships, residencies).

http://visegradfund.org

Visegrad Fund

State of the Future Index (SOFI) is a measure of the 10-year outlook for the future based on historical data for the last 20 years. It is constructed with key variables and forecasts that, in the aggregate, depict whether the future promises to be better or worse. The SOFI is intended to show the directions and intensity of change and to identify the factors responsible.

It provides a mechanism for studying the relationships among the items in a system—how making a single change ripples throughout a system, in other words, creating some positive and intended consequences as well as unintended results. SOFI includes a unique combination of features: the subject (SOFI is a quantitative forecast of general future outlook); the elements/variables (determined by groups of experts); probabilistic nature (the forecasts of the constituent variables and the SOFI are displayed as a fan of possibilities rather than single values); a set of "standards": allowing nation-to-nation and regional comparisons. SOFIs have been constructed in several countries including Kuwait, South Africa, Azerbaijan, China, Turkey, South Korea, East Timor and others. This book is a report of a project carried out by several Central European institutions in conjunction with the The Millennium Project (Washington, DC), presenting such measure for Member States of the Visegrad Group as well as the region in its entirety.

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