Prosperity Indicators: A Landscape Analysis

George Markou[1], Eleni Palaiolouga[1], Panagiotis Kokkinakos[1], Ourania Markaki[1],
Sotirios Koussouris[1] and Dimitrios Askounis[1]

[1] Decision Support Systems Laboratory, National Technical University of Athens,
Iroon Polytechneiou 9, Zografou, 15780, Greece
markougeorgios@gmail.com, elenipal@hotmail.com, {pkokkinakos,
skous, omarkaki, ckoutras, akous}@epu.ntua.gr

Abstract. Prosperity indicators (also met as welfare indexes) constitute an important metric towards assessing the level of prosperity in modern communities and/or countries. The document at hand aims at a thorough search, study and recording of various prosperity indicators (e.g. Gross Domestic Product - GDP) used in European and global scale, as well as of the underlying data. The document examines and analyses 21 prosperity indicators (14 economic and 7 social indicators), that were selected by the authors as the most widely accepted and utilised. Moreover, a creative review on the aforementioned indexes is realized, targeting towards recognising and documenting any existing methodological or application gaps. Last but not least, a comparative analysis of trends in modern indicators is also included.

1 Introduction

As prosperity indicators we define certain numerical values or mathematical formulas that, when calculated in specific (predefined) intervals, can relatively accurately facilitate the monitoring and evaluation of the improvement or deterioration of the status (economic and social) of a specific region or population[1]. Prosperity indicators have been heavily used for decades to estimate (and, in general, provide insights about) parameters that are of specific interest to humans. Amongst the most famous prosperity indicators one can definitely report the GDP (Gross Domestic Product); GDP is still used today as an indication of economic growth and prosperity of a country [3].

People use indicators in their daily lives usually to realize a change in a 'normal' or desired state. Thus, for example, fever is a sign of health deterioration; the red light is utilized to indicate that the car is running out of fuel. From a more scientific point of view, indicators are commonly used to provide information on predetermined objectives. This same type of information is important for policy making too, as policy makers seek for the ability to make accurate and timely assessments of specific situations and take the necessary decisions [2].

---

[1] http://slideplayer.gr/slide/1956467/

Along these lines, this paper aims at a thorough search, study and recording of various prosperity indicators (e.g. Gross Domestic Product - GDP) used in European and global scale, as well as of the underlying data. Moreover, a creative review on the aforementioned indexes is realized, targeting towards recognising and documenting any existing methodological or application gaps.

The paper at hand is structured as follows: Section 1 serves as an introduction; Section 2 exposes the main characteristics of prosperity indicators, followed by Section 3 that presents a short analysis of the prosperity indicators' landscape. Section 4 serves as a field gap recognition approach, while Section 5 concludes the document.

2   Main Characteristics and Qualities of Prosperity Indicators

Prosperity indicators present a broad spectrum of characteristics; those characteristics can be also utilized as categorization criteria, towards organizing them in groups. Based on their type, as prosperity indicators one can also consider the following categories:

- Financial indicators, that focus on measurable economic sectors
- Social indicators, touching upon issues such as health, education, housing, security, population characteristics.
- Environmental indicators, reflecting the quality of the environment or natural resources of the region. They mainly aim towards dealing with environmental concerns.
- Cultural indicators, referring to the maintenance and restoration of historic and cultural heritage.

Prosperity indicators do not have univocal use or even application. Various types of stakeholders (indicatively, yet not exhaustively, including policy makers, researchers, investors, NGOs, consultants, individual citizens etc.) engage with prosperity indicators, utilizing them, for example, for one (or more) of the following purposes:

- Providing information on the environmental, financial and/or societal status of a specific organization, region etc.
- Indicating shortcomings, weaknesses and potential problems, in order to facilitate proactive/corrective actions.
- Providing evidence on the performance and effectiveness of actions and measures, i.e. being utilized as a performance assessment tool that examines the performance and/or sustainability of specific initiatives.
- Offering support in formulating strategies and policies, i.e. being used as a design/planning tool that helps decision makers choose among alternative policies.
- Clarifying the objectives and priorities of development initiatives and/or necessary strategies.
- Informing and raising awareness about the importance of specific initiatives and policies.
- Enabling gaps' identification in existing situations and building the theoretical framework for the collection of the necessary data.

- Reflecting relationships amongst various factors, taking into account the dynamics that are developed in complex systems.
- Identifying groups with emerging needs, in an effort to determine arrangements for assistance provision.
- Serving as a comparable measure for the purpose of intervention, programming, planning and evaluation of specific services.

Nevertheless, in order to be really useful and credible, prosperity indicators have to follow some basic rules and specific qualities. Amongst the main ones, one can report:

- Reliability: the indicators are reliable if repeated applications based on the same data during the same time frame generate the same result.
- Precision: indicators are accurate enough when their calculation can provide the necessary level of detail.
- Validity: indicators are considered truthful if they reflect exactly the situation they have been developed for.
- Sensitivity: indicators are considered sensitive if changes in the present situation are fully reflected in simultaneous changes in the indicators' values.
- Comprehensiveness: indicators are considered comprehensive if they can be applied to all intended cases without structural modifications.
- Comparability: indicators are comparable if their definitions, the data collection methodology and the method of measurement is the same (or based on the same principles) for every case.
- Consistency: indicators are consistent if the outcomes of their calculation are comparable over time.
- Timeliness: indicators are considered timely if the calculation process as a whole is fast enough in order to provide the requested result within the time frame set by the stakeholder.
- Homogeneity: indicators are considered homogeneous if there is no change over time in the geographic area they cover.

2.1 Advantages of Prosperity Indicators

Prosperity indicators differ from raw or statistically processed data, as they provide meaningful insights beyond the isolated numerical result, or the difficulty to understand mathematical definition; they actually act as the bridge between data and detailed explanatory information. Therefore, prosperity indicators provide a "one-stop-shop" for stakeholders that want to quickly analyze a specific issue.

This results as a facilitation and acceleration of the process (e.g. an evaluation procedure) itself, but also serves as a tool for achieving a better understanding of the issue under investigation. Of course, this depends to a large extent on the selection of appropriate indicators.

Another advantage resulting from the use of indicators is the ease of comparison of results and their ability to be easily calculated/replicated for different periods of time or different locations of interest. Indicators which have been developed based on a properly structured theoretical framework can be used to make comparisons over time

or between different regions, to identify correlations and to constantly monitor changes and trends.

2.2 Problems in the use of Prosperity Indicators

As shown in the previous sections, prosperity indicators are applicable to a wide range of areas and can prove to be an extremely valuable tool in the hands of various stakeholders.

However, prosperity indicators are not a panacea. There is a rather large number of issues connected to their use, some of which are not easy to deal with. The following list provides an indicative listing of such issues:

- Subjectivity, which can be met both during the choice of the exact indicators to be used, as well as in the process of interpreting the results.
- Lack of suitable data, which may result in neglecting significant information and coming up with results that reflect what is possible and not what is actually important.
- Flooding indicators with too many parameters and data, generating outcomes difficult to comprehend and/or explain.
- The fact that strong hypotheses are necessary in the initial steps; a process always questionable.
- The high cost for their creation and (more importantly) of their continuous updating.

3   Prosperity Indicators' Landscape Analysis

In order to perform a quick, yet detailed, overview of the prosperity indicators landscape, a large number of indicators has been analysed. As the analysis needed to be as objective and as complete as possible, the authors have sought for well-established and widely utilised prosperity indicators, deriving from a variety of different sources. The two broad "umbrella areas" that were represented in the analysis were those of the financial and social indicators.

Economy is represented by a major and totally measurable set of individual metrics, referring to a system, an organisation or even a country/ region. Economic/ Financial indicators tend to measure the flow of money, labour, transactions etc. The high correlation between prosperity and economy derives from the definition of economic activity itself: the main objective of economic activity is to maintain and improve the quality of human life. However, traditional economic indicators are simply combined metrics, usually without taking into consideration whether economic activity improves or harms the quality of life. Modern (and more viable) economic indicators highlight the ways in which economic activity impacts and interacts with society and the environment.

From the other hand, social indicators constitute a direct and statistical measure which monitors and records the levels and changes of a "fundamental social concern", the fundamental human well-being. Social indicators can serve a number of objectives

relevant to prosperity and growth. They also constitute a critical tool towards the development, assessment and monitoring of policies and/or policy making. They can describe both in quantitative and qualitative terms the level of social development achieved in a society and the actual status and/or progress of social problems. In addition, they are even utilised in the analysis of entire social systems. Along the previous lines, an analysis based on social indicators has two key purposes: a) to monitor social change and b) to measure individual and overall well-being. Even from their early stages, social indicators have attracted the interest not only of sociologists and statisticians, but also psychologists, economists, political scientists and other practitioners in many countries of the world. During the last three decades the research on indicators has managed to improve enough to measure quality of life.

Along the above lines, the authors identified, recorded and analysed 21 well-established prosperity indicators (14 economic and 7 social ones), that can be found in the following list:

- Gross Domestic Product – GDP
- Unemployment indicator
- Consumer Price Index - CPI
- Commercial Balance
- Labor Cost Index
- Government Gross Debt
- Economic Sentiment Indicator
- International investment Position
- Global Entrepreneurship Monitor
- Global Competitiveness Index
- Energy Dependence Index
- Index of Economic Freedom
- Summary Innovation Index
- Networked Readiness Index
- Human Development Index – HDI
- Multidimensional Poverty Index
- Gender Inequality Index
- Human Capital Index
- Corruption Perceptions Index
- Level of Internet access – households
- Happy Planet Index

In order for the aforementioned indicators to be efficiently and effectively reported and analysed, and in order to facilitate comparisons and conclusions' extraction, a proper description template was designed, comprising of 12 fields, namely:

- Acronym (of the indicator)
- Full Name (of the indicator)
- Issuing Authority: the authority that issues the indicator
- Purpose: a brief description of the what exactly does the indicator intend to measure
- Area of Interest: an indication of whether the indicator is economic or social

- Indicator's Composition and Main Pillars: analyses whether the indicator constitutes a compilation of other indicators, if it is itself a calculation parameter in other (more complex) indicators and what are the main underlying social / economic pillars.
- Time Coverage: information on the period to which the indicator relates and how often it is calculated.
- Geographical Coverage: the geographical area (e.g., country, union of states, cities, etc.) which the indicator refers to.
- Calculation Method: the exact calculation formula of the indicator.
- Measurement Unit: the standard unit of the physical quantity to which the indicator is valuated, if applicable.
- Data Sources / Access to Data: identification of the data sources used to calculate the indicator and of whether there is open access to them.
- Comments: citation of comments, expert opinions and conclusions from studies on the indicator, as well as propositions for further improvement.

Based on the aforementioned analysis, the authors have tried to find an answer to the question: is there actually a need for more/ improved/ modernised indicators?

4 Gap Recognition

Based on the conducted analysis, it is rather easy to conclude that there are plenty of indicators which appear to cover the whole range of economic and social activity (health, labor, welfare, development, agriculture, education, etc.) [1]. The (considered as the) most important indicator of prosperity however, GDP, has been heavily questioned and criticized, since many believe that GDP actually offers no insights on sustainability, actual growth etc. In addition, it is claimed that it fails to attend the depletion or degradation of natural, human and social capital, on which overall economic activity heavily depends. Finally, GDP does not recognize the costs of inequality; it measures higher income as "progress", even if it is concentrated and quality of life has actually declined for the majority.

The trend towards ensuring sustainable growth has led to the quest for new approaches. Indicative indicators resulting for this process are the Genuine Progress Indicator, Green Savings, and Green GDP [5]. Major organizations have launched initiatives to find new GDP-like indicators, such as the OECD and the European Parliament. Eurostat is also developing a program for the inclusion of new indicators to better assess economic performance and policy analysis. It can be also seen that in the near future, further attention will be given to investments, rather than the current expenditure.

In any case, there is an urgent need to adopt progress/ prosperity indicators which go beyond the conventional GDP; a fact now recognized by high-profile organizations and structures such as the OECD and the EU. The main objective is to try to measure what really "counts" and really affects citizens' lives; more focus shall be put on actual human lives and the plat itself, rather than financial figures.

Therefore, what is actually necessary is not the creation of new indicators; rather turning to those who treat citizens as the center of society and take into consideration actually important aspects. This claim is arising from certain facts:

- Actually caring for society builds stronger economies. Nevertheless, economic and social investment impact indicators on social assistance have not been incorporated in the key economic indicators yet.
- Gender equality matters. When the societal groups of women and children are supported, economies develop. Studies show that the position of women is a strong predictor of overall quality of life and long-term economic prosperity.
- During the last decade the scientific world writes about the shortcomings of existing indicators and the need for detachment from the existing "classic" indicators and the creation of new indicators [4].
- According to an independent research group in Britain, aimed at building a new economy centered on people and the environment, Costa Rica is the happiest place on earth. Happiness is a central point of more and more inquiries. While economists measure the prosperity of a nation in terms of GDP, there is a growing movement that uses a different measure, the "Gross National Happiness". Trying to escape the GDP-happiness link, this research takes as a measure of national prosperity on the UN Human Development Index, which incorporates three factors: life, educational attainment and adjusted real income. The report covers 99% of the population. The British research team used the "Happy Planet Index", which includes the countries with the happiest people. The index gives progressively higher rankings in nations with lower ecological footprint.
- If macro-economic indicators tell the truth, then Guatemala is a country galloping towards prosperity. Based on studies and specific indicators, Guatemala is one of the most stable and growing economies of Central and South America. Inflation is minimal, monetary parity is constantly stable, unemployment is less than 3% and exports bloom. Guatemala is the fourth country in the world in exports of sugar, while also ranked among the first places in exports of bananas and coffee. The country also exports fresh vegetables, dairy products in Europe, meat, shrimps, rubber, solar energy and biofuels. Large oil fields are located in Peten, all exploited by the private sector, which generates 85% of Guatemala's GDP. However, within this triumphant framework set by prosperity indicators, the National Economic Research Center of Guatemala (CIEN) announced: *«If the country continues in this way, it will take 100 years to double the inhabitants' standard of living"*.

5   Conclusions

Prosperity of a country has been traditionally associated with a set of (mostly economic) indicators. The most important indicators that can provide useful information

(a conservative-economic consideration) for the economic progress of a country are the following:

- Gross Domestic Product
- Inflation
- Unemployment
- Imports/ Exports
- Financial indicators such as government revenue, public expenditure, budget deficit, public debt, public investments etc.

GDP is at the top of wellbeing-related indicators. Nevertheless, GDP ignores any variation in wealth, international income flows, the production of domestic services, environmental deterioration and many of the determinants of prosperity, such as the quality of social relationships, financial security and personal safety, health and longevity.

As mentioned in the previous sections of the document at hand, there have been several attempts to adopt new indicators in order to replace GDP. Many of these indicators are based on the weighting of a large number of variables into a composite indicator and usually do not reach a concrete conclusion, but just record several indicators separately so the user usually asks "what does it all mean?"

Any choice of specific indicators to be used for analysis is in fact of? "Limited" and/or condensed knowledge; and the need to have a specific scientific and socio-cultural background in order to understand the results is the usual situation. Another problem that can occur is the lack of suitable data, which may result in disregarding significant information. Finally, the problem may be also related to the overconcentration of too many things all together, resulting in the lack of a clear meaning and therefore reducing the communication power and analytical capability of the indicator. Indicators which are not selected carefully and in a systematic manner may have the effect of transferring the wrong message and thus leading to wrong conclusions.

From the plethora of available indicators, the majority are complex/ derivative ones and is very easy to change the results of an indicator if the weighting of the individual criteria/ pillars/ parameters is altered. It is also fairly easy for stakeholders with the appropriate background to propose new indicators.

With all this abundance of indicators, how can we ensure that prosperity analyses will be done in a proper manner? Another question that arises is whether the indicators are reliable. Can correlations amongst indicators lead to wrong conclusions and erroneous policies? Can these in turn negatively affect the welfare of the people, which is ultimate goal?

The main conclusion is that the analysis has to go beyond economic/ financial metrics. Economic values and percentages should not be the focal point of interest; emphasis should be placed instead on more qualitative issues. Last but not least, issues that have been ignored so far, such as the quality of life and human well-being, should constitute the main pillars for modern prosperity indicators and the respective analysis.

Acknowledgements

References

1. Cédric Afsa-Didier Blanchet-Vincent Marcus-Pierre-Alain Pionnier-Laurence Rioux-Marco Mira d'Ercole-Giulia Ranuzzi-Paul Schreyer, Survey Of Existing Approaches To Measuring Socio-Economic Progress, Commission on the Measurement of Economic Performance and social Progress
2. Farsari I.; Prastakos P., "Sustainable Development Indicators: Their contribution and international trends", Institute of Computational Mathematics, Foundation for Research and Technology (in Greek)
3. Kokkinakos, P.; Markaki, O.; Koussouris, S.; Psarras, I.; Lohe, M.; Glikman, Y.; Arjona Almazan, M., "Towards more factual, evidence-based, transparent and accountable policy evaluation and analysis: The policy compass approach," in eChallenges e-2014, 2014 Conference , vol., no., pp.1-9, 29-30 Oct. 2014
4. Stiglitz, J.; Sen, A.; Fitouss, J-P.; Report by the Commission on the Measurement of Economic Performance and Social Progress.
5. Talberth, J.; "Measuring What Matters: GDP, Ecosystems and the Environment (2010)",http://www.wri.org/blog/measuring-what-matters-gdp-ecosystems-and-environment