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THE LABOR THEORY OF VALUE STRIKES BACK: ULC + THE METHOD FOR MEASURING THE LEVEL OF NATIONAL COMPETITIVENESS

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Abstract

National competitiveness, macro-competitiveness, and competitiveness of states; those seemingly simple and common terms, are actually highly controversial. The interpretation of historical backgrounds and basic postulates which have been the foundations of methods for the measurement of macro-competitiveness since the 1970s to the present, is a matter of interest in the first part of this paper. Just after this, we will provide critical observations on methods used so far - which is necessary if we want to make a contribution to the further development of theory (and practice). The second part of this work, which is smaller in quantity but larger in quality, is committed to the development of the theoretical foundation for the development of the new fourth generation of methods for measurement of macro-competitiveness. We entitled this method ULC + the method for measurement of national competitiveness and it is based on the synthesis of Michael Porter's idea that productivity is a synonym for competitiveness and the direct (outputs) methods for measurement of national competitiveness. We have done this by using working hours as a common measuring unit which would enable us to sum "apples and oranges", meaning the cost of labor and the cost of capital.

Keywords: *national competitiveness, methods for measurement, synthesis*

JEL Classification: *E 20, F 40*

Introduction

The purpose of this paper is to show that measuring the level of national competitiveness is an issue of enormous importance for each society, and probably due to it, an issue which cannot stay only in the field of economics. In fact, we can identify three stages in measuring the level of macro-competitiveness, or as we will call it, *three generations of national competitiveness measurement*, although, as far as we know, nobody classifies it that way.

The beginning of this paper is reserved for the interpretation of those three stages,

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i.e. we will explain the broader economic and political context which caused it, and after that, we will propose one new approach for measuring the level of national competitiveness. That approach will be based on a kind of synthesis of the first and second generation of methods, and we will entitle it ULC (Unit Labor Cost) + the method for measurement of national competitiveness. It is not a totally new method, because it is similar to - but inverse of - the concept of total factor productivity (TFP). In this paper, we will not, as we originally planned, conduct the application of this method to a group of European countries to evaluate their competitiveness level and to compare the results with the rank-list of countries by the last Global Competitiveness Report (GCR), nor will we rank it by the 6BIC[2] method. We will not do this because this paper, which would contain both a theoretical basis (which we will be developing here) and application, would become more than 30 pages long, and this is not acceptable by the standards of the conference in which this paper is meant to be presented and published. So, very soon after this paper is published, another will follow and that one will contain the application of the developed method to the group of aforementioned countries.

The first generation of methods for measuring the level of national competitiveness

In literature, the affirmation of the national competitiveness concept is usually connected with the beginning of the 1980s. According to Delgaro and others (Delgaro et al, 2012: 6), during the 1980s, national competitiveness became an important issue due to the export success of Japan and fear in the US that it will lose its position among the leading industrial countries[3]. In this period, the concept of national competitiveness rapidly developed through discussions about three questions: market share, production costs, and finally, productivity. The big news was that those concepts, for the first time, were considered at a level of national economies (meaning macroeconomic level).

Without the intent to dispute that both public and academic debate in the US on this issue was moving this way, we want to address the broader (global economic and political) circumstances which caused the rise of interest among economists and decision makers in the concept of national competitiveness. First of all, we should note that the USSR and other countries of the so called “eastern bloc” in the late 1970s came into a period of economic decline. More precisely, in the late 1970s, after the early success of industrialization through a substitution strategy[4], the majority of communist countries from Eastern Europe faced deep economic problems with the decline of

2 This method for measuring the level of national competitiveness was developed by Djogo and Stanicic in their paper entitled *Is the Global Competitiveness Report the right measure of macroeconomic competitiveness*, Proceedings of Rijeka Faculty of Economics, *Journal of Economics and Business*, Vol. 34, No. 1, 2016, pp. 91-117.

3 At the end of 1980s, industrialization was still a synonym of development, which for example, could be seen from the UN's *Human Development Report,* where, in the 1990 edition, the term Industrial Countries was used as a synonym for developed countries. An even more interesting example is the IMF's *World Economic Outlook*, which up to its 1997 edition, divided the countries into three groups: industrial countries, developing countries and countries in transition. In the middle of 1990s, the majority of economists accepted the view that advanced economy countries came to the stage of the so called post-industrial society, with deindustrialization as an irreversible process. More on this could be seen in Lynge, N. (2011).

4 According to Vietor (2007: 186), the average rate of economic growth of the USSR during the Stalin era (1924-1953) was impressive, 5.5% per year and it decreased to the average of 3.7% during the Khrushchev era (1953-1964).

productivity, slow economic growth and a shortage of basic consumer goods[5]. In such circumstances, every objective measurement of economic performance suggested a near triumph of capitalism and collapse of communist economies. A small number of authors from Eastern Europe who tried to discuss the issue of national competitiveness which their countries were facing, received pressure from authorities (Kovacevic, 2010: 3). On the other hand, in advanced capitalist economies, this kind of research was encouraged, so authors from these countries offered the first generation methods for measurement of national competitiveness levels.

For example, Jan Fagerberg, one of the leading authorities in the field of competitiveness during the second part of the 20th century, thought that focus should be put on the increase of living standards (not only by the increase in real income, but also by creating new jobs) simultaneously with keeping payment in balance (Fagerberg, 1988).

Krugman had almost the same thought about macro-competitiveness and, with a group of authors, defined national competitiveness in this way: "*Competitiveness is the capability of a country to keep its current account in balance along with improving standards of living*" (Kovačević, 2010: 8). Jeffrey Sachs and Andrew Warner emphasized the importance of dynamic economic growth in the long run (Kovačević, 2010: 8), while B. Scott and G. Lodge defined competitiveness as: "*the capability of a country to use its resources with high efficiency according to international specialization and trade, so that in the end, it brings the rise of real income and the improvement of the standard of living, all of which is based on real categories, not on borrowing abroad*" (Scott and Klodge, 1985: 15, in Kovacevic, 2010: 6). As you can see, an important element of macro-competitiveness for Scott and Klodge was not borrowing abroad, which was the usual approach until the end of the 1980s. In this period, many other authors offered their definitions of national competitiveness but, more or less, all of them were based on the same criteria.

It is important to notice that all those definitions were based on monitoring only the macroeconomic results, which is the reason why methods for measuring national competitiveness, based on those definitions, were named "outcome methods".

The second generation of methods for measuring the level of national competitiveness

Changes came with the end of the 1980s. In the middle of this decade, the triumph of capitalism over communism became obvious, and almost the whole world started to participate in processes later described as the "second wave of globalization". General liberalization of trade and capital flows at that time were considered a return to the golden age and the "*end of history*"[6], which is best illustrated in the acronym TINA[7] invented by the British Prime Minister - Margaret Thatcher. However, in this triumph of liberalism, the greatest economy in the world – the economy of the US -

5 According to Vietor (2007: 186-7), since 1975, the rate of productivity in the USSR has become negative (has shown productivity decrease of), while in the 1980s, the average rate of economic growth declined to less than 2% per year.

6 At that time, Fukuyama wrote that human civilization came the end of its evolution by reaching the optimal model of existing democratic-market-oriented type of society (Fukuyama, 1992, in Stojanov, Drašković, 2014: 10).

7 There is no alternative.

started to record an increase of its trade deficit[8], budget deficit[9] and external debt[10] more often and more significantly. In those circumstances, the "old" definition of national competitiveness which insisted on a balanced trade balance and on not borrowing abroad became unacceptable for the majority of the US economists and political establishment. Simply, it was unacceptable that a leading country of the free world, instead of being an example of competitiveness, to become an example of uncompetitiveness. In that moment, Michael Porter emerged with his book *The Competitive Advantage of Nations*, published in 1990. In this book, he equates competitiveness with productivity even at the national level. Porter expressed this idea in his famous sentence: "*The only meaningful concept of competitiveness at the national level is national producivity*" (Porter, 1998: 6). This could be considered as the beginning of the use of second generation methods for measuring national competitiveness.

With this approach, the most developed economies in world, especially the US economy, returned to the top of the national competitiveness list.

What is also important to notice according to Porter, is that productivity is not only dependent on macroeconomic factors and it shouldn't be measured only by results. Porter's main contribution to economic theory was that he pointed out that some microeconomic factors like business environment, the utilization of sophisticated management skills etc. are also important for reaching a higher level of national productivity or competitiveness.

Although competitiveness understood this way better corresponded to the US needs, it would be honest to point out some aspects of globalization which also explain the general need for this change. So, in a globalized world, the main "players" were no longer the states (at least those smaller and less developed). Actually, the main players became to be the Transnational Corporations (TNCs), which partially outgrow from "rules takers" to "rules makers". In such circumstances, the usage of a standard balance of payment statistics became inadequate, as it is noted by Stojanov and Draskovic (Stojanov and Draskovic, 2014: 13), and this made the traditional measurement of national competitiveness by macroeconomic indicators obsolete to some degree. In those circumstances, Porter's approach to issues of national competitiveness slowly became dominant in the following decades. It was accepted by many institutions. The best known example is the World Economic Forum (WEF) in Geneva which, during the 1990s, changed its methodology for measuring the level of national competitiveness in its famous Global Competitiveness Report (GCR), which started being published in 1979. Also, as Delgaro and others pointed out (Delgaoro et al, 2012: 9), many other developing documents like the OECD Growth Agenda (OECD, 2005) and the European Commission 2020 Strategy (EC, 2010) are to a significant degree based on this approach of competitiveness as productivity.

Nevertheless, the most interesting issue, and the most relevant for this paper, is the

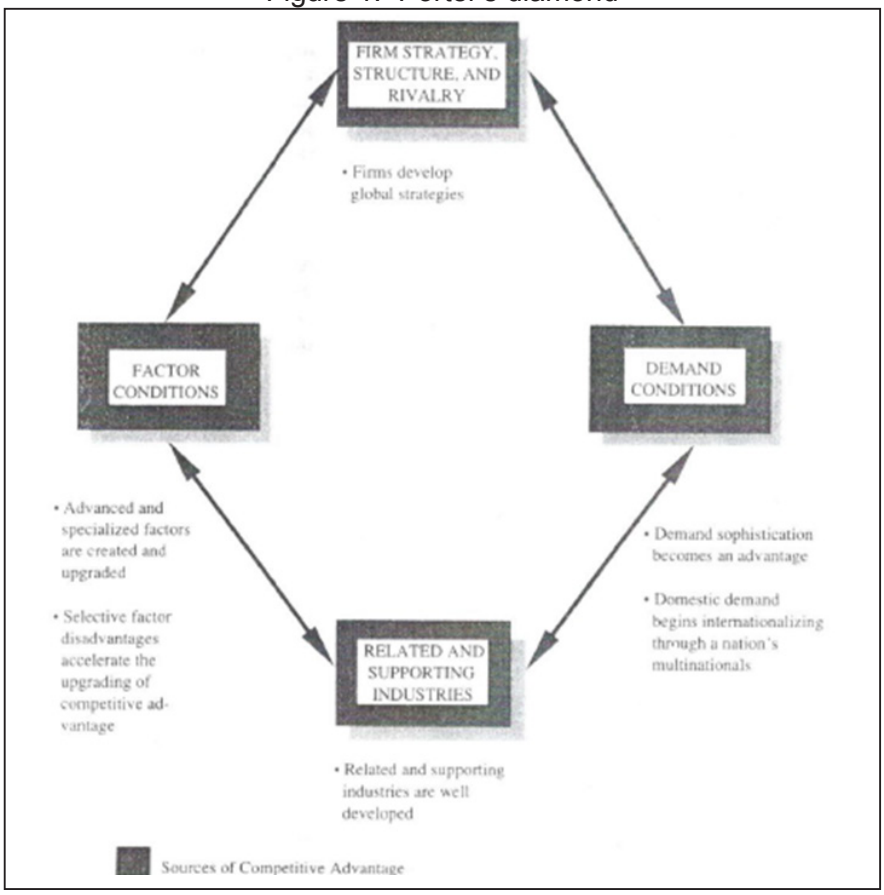
8 https://data.worldbank.org/indicator/BN.CAB.XOKA.CD?locations=US&view=chart, date of access: 29.7.2018.

9 https://data.worldbank.org/indicator/GC.DOD.TOTL.GD.ZS?locations=US&view=chart, date of access: 29.7.2018.

10 Actually, according to Varufakis (2017), the increase of trade deficit and rise of external debt of the US started even earlier, precisely in mid1970s, as a consequence of abandoning Breton-Wood's international monetary system and the desire of the US authorities to maintain the US position as center of world economy and finance even in those circumstances.

fact that Porter, from the very beginning, did not try to measure the level of national competitiveness directly, such as by using comparison between inputs used and the outputs resulted in different countries; and instead used an elaborate set of assumptions about factors that influenced the productivity level (the so called Porter's diamond) and through measuring these factors he indirectly measured the level of national competitiveness.
Here is the Porter's diamond[11]:

Figure 1. Porter's diamond



Source: Porter, M (1998), p. 553

The transformation of Porter's diamond into a practical micro-economic indicator used in the GCR (done by Porter himself) and the integration of it with macro-economic indicators provided by Sachs resulted in the emergence of the "12 pillars of competitiveness" which are: institutions, infrastructure, macroeconomic environment, health and primary education, higher education and training, good market efficiency, labor market efficiency, financial market development, technological readiness, market size, business sophistication, and innovation.

11 It should be mentioned that we present this diamond for innovation-driven economy, i.e. the highest stage in economic development, according to Porter.

The third generation of methods for measuring the level of national competitiveness

Like any other theoretical construction, Porter's model, in time, faced contestations which resulted in the creation of a new generation of methods for measurement of the level of national competitiveness.
The contestations go in a few directions.

The first line of contestations suggests that Porter's indicators (pillars) of competitiveness are difficult for measurement, so rank-lists based on those indicators are less reliable than those composed by the users of first generation of methods. To be more precise, Porter's indicators of competitiveness through productivity quite often rely on studies of subjective estimations of different values, while the first generation relied on the outcomes that economists historically used to measure.

The second line of criticism is connected with the issue of indicators which Porter and Sachs failed to include in their method for competitiveness measurement (meaning GCR), while some other authors considered those indicators to be important. For example, Kovacevic (Kovačević, 2010: 9-11) stressed the absence of the level of investment, trade deficit and external debt in the GCR as an important fault. Djogo and Stanisic (Djogo and Stanisic, 2016) offered new methods for measuring the level of national competitiveness entitled 6BIC (six basic indicators of competitiveness) which is close in opinion to Kovacevic. This could be seen from the list of indicators used in the 6BIC method which include: trade balance, unemployment rate, income level, level of external debt, the average economic growth rate in last 5 years, and the rate of investment. This approach could be considered as a method of the first "plus" generation, i.e. as return to the measurement of competitiveness through outcomes, with the only difference being that this method is based on a wider list of economic criteria than it was before.

Here, we should have mentioned one more paper written by Segota and others (Šegota et al, 2017). In this paper, they applied the Data Envelopment Analysis (DEA) on the GCR in an attempt to evaluate macroeconomic efficiency in the use of production factors in 26 EU member states. This is also a new variation of the first "plus" generation method for the measurement of national competitiveness.

But, the appearance of something that could be truly considered a third generation method for the measurement of the level of national competitiveness, is closely connected, with some exceptions by a significant number of experts and institutions, with a stance that not only purely economic criteria, but also some non-economic criteria should be included, as well.

A typical example of this new approach can be found in the recent works of the aforementioned Jeffrey Sachs[12] who, in the last couple of years, actively advocated

12 On July 26, 2018, we had the honor to be present at a public lecture by Jeffry Sachs (the title of the lecture was: Jeffry Sachs about the Agenda 2030 - challenges and possibilities for countries and regions, Bosnia and Western Balkans), organized by the Bosnjack Institute, Sarajevo. At this lecture, professor Sachs expressed his disappointment with the model of development of his native country (USA) and suggested that the Scandinavian countries' model of development is the optimal one and that it should be followed by other countries, because it relies on respect for the basic principles of market economy, social systems -which invest in human capital- (mainly in education and health care), and environmental sustainability.

this model of social and ecological sustainable development.
In any case, in Europe, which from the very beginning was experimenting with the specific model of social and economic development called the "European social model", the need to overcome the GCR model and to establish a new method for measurement of the national competitiveness level on a very different foundation has been discussed for some time.
A good example of this new European approach could be found in the paper entitled *Competitiveness under a New Perspective* prepared by the Austrian Institute of Economic Research (under the motto Welfare, Wealth and Work for Europe), intended for the European Commission. In this Report from 2012, the staff of WIFO underline the differences between the "traditional" outcome criteria for measurement of the level of national competitiveness and the criteria they use. According to this report, traditional criteria include: GDP per capita, unemployment and employment rates, budget deficit, public debt, and trade surplus/deficit (Aiginger et al., 2013: 38). But WIFO staff believe that social issues ("social pillar of competitiveness") and ecological issues ("ecological pillar of competitiveness") cannot be excluded from consideration. WIFO even offers its short but interesting definition of national competitiveness in this way: "*the ability of a country, region or location to deliver beyond GDP goals*" (Aiginger et al., 2013: 38).

The general stance of the authors of this report is that European countries should move away from price competitiveness because this sort of competitiveness is closely connected with pressure to limit salaries, and this will primarily affect the welfare of society[13] (Aiginger et al., 2013: 19).

WIFO uses a simple method - Unit Labor Cost (ULC) for the measurement of price competitiveness. To estimate the level of quality competitiveness, WIFO uses economic structure (the structure of production and the structure of export) as an indicator. To evaluate the quality of competitiveness in production and exports, WIFO applies eight classifications: main factor inputs used (labor intensive, capital intensive and marketing- and technology-driven industries), types of skills used (low-, medium and high-skill intensive industries), types of service inputs used (transport services, retail and advertising services and knowledge-based services inputs), competitive mode (whether success depends mainly on price or quality competition), intensity of innovation (from low to medium and high), education intensity (from low to medium and high), and the shares of ecological and renewable industries. According to the WIFO staff, the capability of countries to reach a high level of quality competitiveness depends on their innovation ability, education quality, influence of their social system on an increasing productivity level (with a positive impact as a premise[14]), ecological "ambitions" of enterprises, and quality of institutions.

13 Numerous contemporary researchers, with Thomas Piketti's Capital in the 21th century as the last prominent example, insist that the central issue of economic science was and still should be the distribution of wealth and the influence of it on the long-run sustainability of an economic system. Actually, this discussion in the economic science on how to use the limited resources in the most effective way or how to satisfy the needs of a wide-ranging group of people, has its dogmatic character, and in this way or that, has lasted since the very beginning of economics as science through the struggle between liberals and interventionists.

14 This is the right moment to underline the different dogmatic approaches of Report's authors (with foundations in the European social model), against neoliberal authors who usually connect generous social systems with reduced productivity of labor.

The fourth generation of methods for measuring the level of national competitiveness – synthesis of Porter approach and labor theory of value

Although it is widely accepted that the methods for measuring the level of national competitiveness used by WEF and WIFO represent the cutting edge of economic science in thiss field, our research has led us to believe that there is a lot of room for further improvement and especially for one missed chance.

Here is a short explanation. In measuring the level of national competitiveness, Porter took a bypass by measuring indicators which affected the level of national productivity instead of measuring productivity directly. This is contrary to his stance and general reasoning that productivity (competitiveness) should be defined as: "*the value of the output produced by a unit of labor or capital*" (Porter, 1998: 6), and measured in the same way. So, there is a possibility to convert Porter's thought into a new method for measuring the level of national competitiveness. It is possible that Porter had been missing this for decades, probably because he didn't want to promote price competitiveness which, at first sight, could be measured only in this way. This could be done by a synthesis of Porter's approach (competitiveness is productivity) and the labor theory of value, which today is generally considered a historical anachronism.

The labor theory of value, widely accepted from the time of Adam Smith and on which Marx based his *Capital*, had been abandoned in the last decades of the 19th century. The generally accepted school of thought is that in economic history this theory "buried" Alfred Marshall in the year 1890, with his book *Principles of economics*. In this book, he developed supply and demand curves and in their cut-set, the equilibrium market prize equals value, which is a stance that we still accept today.

With all these imperfections in the labor theory of value, we still believe that this synthesis promises interesting possibilities. It looks like this approach for the measurement of national competitiveness level (productivity) would be superior to the GCR indirect method. An explanation for this judgment can be found in the fact that this approach puts in relation only one outcome, for instance BDP, and the resources used for the creation of it, all expressed in working hours. This would provide a much simpler (reliable) method and ensure a vertical in measuring the level of productivity (competitiveness) from the level of person, through the level of companies, industries, to the national level.

However, this brings us to the problem of how to determine which resources are really engaged in the creation of outcome, in this case BDP, and what is even more controversial, in the context of their measurement, how to enable the gathering of "apples and oranges". We entitle this dilemma Kishon's delusion after the famous Israelly producer, writer and humorist Efraim Kishon.

In the middle of the 1980s, when the whole world was fascinated with Japan and Japanese products, Kishon wrote satiric novels about the Israeli syndicates and their influence on labor productivity. In those novels, Japanese television factories with a few hundred workers produce more TV-devices than Israeli factories with a few thousand workers. But, the issue Kishon didn't take into account is the value of machinery, meaning robotized factories, which Japanese companies used in their production and which enabled such labor productivity. As it is explained by the Hechscher-Ohlin

theory, the same product could be efficiently produced with a different combination of production factors, since the price of production in factories (and technology applied) depends on the factors' availability. So, in countries in which labor is cheap, the same product could be produced at the same price per unit, with lower-labor-productivity technology. This is the reason why the conclusion that Japanese producers are superior over the producers from the rest of the world just because Japan's workers are more productive, could be wrong. In fact, this conclusion is right only if the savings in labor cost of Japanese producers are bigger than their investment in advance, with a labor-saving technology. If we lift this speculation to the level of national economy, we have to transform investments in new technology into the same measuring unit. For reasons which we will explain later, we will do this, not by expressing everything in money value, but by using working hours. By this, we have created what we entitled ULC + the method for measuring the level of national competitiveness.

This method is obviously similar to the ULC method for measuring the level of labor productivity. That method is already in use as a secondary method for measuring the level of national competitiveness and for the estimation of whether the current position in trade balance is sustainable. For example, the OECD[15] and the Japan Productivity Center[16] have used ULC for decades as an important alternative indicator of current competitiveness.

Before we jump to the presentation of the formula for the calculation of ULC+, we want to remember that even Porter in the aforementioned paper *The Determinants of National Competitiveness* (he is a co-author), suggested a new method for measurement of the level of national competitiveness closely connected with labor productivity. The basis of this new method is entitled *Foundational Competitiveness* and it is defined as: "*the expected level of output per working-age individual given the overall quality of a country as a place to do business*" (Delgaro, 2012: 8). From the explanation provided in this paper we can see that the foundation competitiveness is a concept based on a combination of measuring the productivity of employed workers and the ability to employ. Derivative from the foundation competitiveness concept is a new indicator of national competitiveness that the authors of the paper named *Global Investment Attractiveness*, "*which is the cost of factors inputs relative to a country's competitiveness*" (Delgaro et al, 2012:1).

Formula for calculating ULC + indicator (ICNP)

In developing the formula for calculating ULC + indicator, named the Indicator of Current National Productivity (ICNP), we started from the classical assumption about the existence of three factors of production: labor, capital and land, which are more or less productive and included in the creation of GDP.

But, before we present our proposal of the formula for the calculation of ULC + indicator, we have to emphasize the importance of the assumptions/constraints on which this method relies.

The first assumption is that the price competitiveness also includes quality

15 https://data.oecd.org/lprdty/gdp-per-hour-worked.htm#indicator-chart, date of access: 3.8.2018.
16 https://www.jpc-net.jp/eng/stats/, date of access: 3.8.2018.

competitiveness. Namely, better quality products and products with a higher level of finalization contain a higher newly created value which would show itself in a higher total factors productivity (TFP). The ULC + method is in some way the inverse form of TFP.[17] We found that the assumption about the sufficiency of price competitiveness for the estimation of overall competitiveness is satisfactory.

Our second assumption is that the factor "land"[18] could be ignored. We are doing this for two reasons. First, we are starting from the assumption that, regardless of applied technology i.e. whether it is labor-saving or capital-saving technology, for the production of two products of the same purpose, approximately the same volume of raw materials is needed. If we compare two similar cars, one made in Japan by a highly robotized factory, and another produced in China by an intensive use of labor, both contain a similar volume of steel, glass, plastic and rubber, so we could ignore the influence of cost of material on our calculation. Also, we considered materials as stock market commodities, i.e. commodities whose price could not fluctuate too much regardless of the destination of production. Another reason is of a technical nature. Namely, even if we wanted to include the factor "land" in our calculation, we unfortunately would not find a general method for the estimation of the value of (agriculture) land. Certainly, the price of land depends on the purchasing power of citizens, the average level of cultivation (irrigation etc.), and the level of access infrastructure development, but some general rule that would suggest that the value of land tends to reach its level, we could not find. For example, we could not find the score of the N-average earnings in the countries corrected for scantiness of land. In any case, ignoring the factor "land" in production functions is something usual in theory and practice, which could be seen, for example, from the Cob-Douglas function.

The third assumption is that the use of capital in each country per year is equal to the gross investment in that country, i.e. to Gross fixed capital formation[19]. With this, we ignore the fact that in some years, the investment could overcome amortization (positive net investment), while during others, the value of amortization could overcome the value of investment (negative net investment that decreases the capital stock). The equalization of the spending of capital with gross investment is something we accepted because the official estimation of capital stock value in the countries of our region is data that is practically impossible to find while all estimations are quite approximate and based on a series of assumptions. Also, our method ignores the structure and quality of investment, which was a serious problem for some communist countries in the past (Burda-Wyplosz, 2005: 54).

The fourth assumption we accepted is that homogeneity of labor, not only within countries but also between countries (one working hour is one working hour in all countries), is also questionable. Namely, in developed countries the labor force is, on

17 TFC is a derivate of Cob-Douglas production function. Its main purpose is to illustrate the influence of increase in inputs (labor and capital) and improvement in technology, on output (GDP). ULC + is based on the assumption about a fixed GDP level. With this assumption and through putting in relation the GDP and value of productivity factors used, we could get a conclusion about the TFC expressed in money value by working hours.

18 Under the factor "land", we include not only agricultural land, but also raw materials.

19 The concept of gross fixed capital formation was developed by Simon Kuznets in the 1930s, but has been widely accepted since the 1950s. GFCF represents the part of the newly created value in an economy, which is invested instead of being consumed.

average, better educated, which is reflected on the average level of salaries.

There is one more issue with our method. This method is based on putting in relation the output realized (GDP) and the value of the production factors engaged in the creation of it. But we ignore the fact that one of the basic indicators of national competitiveness is exactly its ability to employ all resources. In developing countries, the problem of high unemployment and insufficient and inadequate use of natural resources and capital is especially significant.

Being aware of all the limitations mentioned, we developed the following formula for calculation of the Indicator of Current National Productivity (ICNP):

Indicator of current national productivity = (GDP in $) / (average number of workers during a year x working week duration x number of working weeks per year + gross investment transformed from money value to a number of working hours)

As it could be seen from the previous text, the first part of this formula (GDP in $/ number of working hours) is identical to Unit Labor Cost (ULC). But the big difference appears after introducing capital costs into the formula.

As we explained in the preconditions, we equalized the capital costs with gross investments (more precisely we used GFCF), which is the data available to us. Then, we transformed gross investment into the number of working hours by using data about the average hourly wages. Average hourly wages were attained by dividing the average income during the working week in each country by the labor and employment according to the law in that country (most common was 40 hours per week), multiplied by 4.35 (the average number of weeks in one month).

As we already mentioned, we will apply the developed formula in a future paper to official data and to a group of European countries. Thus, we will try to measure their level of national competitiveness instead of their macro-productivity which will overcome the simple measuring of labor productivity.

It is clear that in this paper, we did not approve or deny any concrete hypothesis, but the whole paper could be considered as an introduction or announcement of one broader aspect of research we intend to conduct in the near future, and that will be, we hope, interesting for the domestic and international academia.

Conclusion

Although in this paper we did not present the results of any empirical analysis, we believe that some contribution to science has been made in two ways. First, we expressed our view that the history of methods for the measurement of national competitiveness levels is a history of political needs of societies in which that method first appeared and that trying to hide behind “pure economy” is quite illusive. To be more straight forward,

the first generation methods for measuring the level of national competitiveness were useful to developed countries in order to emphasize the superiority of their economies over autarchy-communist economies. The transition from measuring output to measuring productivity level (second generation of measurement) was necessary primarily for the US, which started to record a chronic trade deficit and growth of external debt. If we take a broader look, this transition (from first generation to second generation) was under the influence of a booming process of globalization which caused national states to stop being the primary subjects of international economic relationships, so that in such circumstances, traditional indicators (trade surplus/deficit, budget surplus/deficit, public debt etc.) could not provide an adequate picture. The pursuit of new methods for measuring the level of national competitiveness which would also hold some non-economic indicators (third generation of methods) was needed by the EU. The European community had to develop a method in line with its development model based on the Lisbon Strategy. Those new methods (third generation) also corresponded to the approach towards social and ecological sustainable development. The development of the fourth generation of methods is in progress and there are a few alternatives where it could end.

Our second contribution to economic theory is connected with the proposed theoretical framework and resulting ULC + method for the measurement of the level of national competitiveness. We pointed out many constraints of this method, but we affirm that it offers some interesting possibilities.

The task for the next paper is to upgrade the ULC + method to the ULC ++ method, through the use of official sources of data and calculating the level of national competitiveness, measured not only as productivity by the use of labor and capital, but as productivity resulting from the use of all three production factors (labor, capital and land).

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