THEORETIC AND PRACTICAL STATISTICAL PROBLEMS OF COMPARISON BETWEEN COUNTRIES

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Abstract

The paper "Theoretic and Practical Statistical Problems of Comparison between Countries" presents two essential causes which determined the necessity of realization the international comparisons which are: the increase of international division of labor and the increase of relations between states. These relations have an essential influence on international comparisons being determined primary by two groups of factors which are the factors with permanent action and the structural factors.

Though the international comparisons are made on the basis of the macroeconomics synthetic indicators computed in Standard National Accounting System, the complexity of the economic world reality imposes the using in analyses of some physical, social and qualitative indicators having as a the result a many sizes research of phenomena and processes.

The problem of *international comparison* comes from the fact that at the global level, exists a necessity of economic co-operation, determined by the international division of labour and influenced by the development degree, the structure and internal functions of national economies. A well-balanced development of national economies have at the base a wide participation at international economic exchanges, about which are created additional possibilities of capitalizations the material and human resources. This international co-operation emphasizes the relations between the national economies, is contributing at the international division of labour and the increase of the flows and exchanges system which assure the introduction in the economic world circuit of natural resources, unequal distributed on earth, the results of progress registered in the science and technique at the national level etc. From this point of view we can consider that the national economies function as open systems and their development is in a permanent relation with the exterior environment.[1]

The internal factor is prevalent in the realization of the economic increase, but an important role has also the intensity of international economic exchanges. In these conditions,

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[1] Anghelache, C., *Măsurarea şi compararea dezvoltării economice*, Editura Economică, Bucureşti, 1996, p. 22

the international comparison, which is difficult anyhow, as a result of incompatibility of national used methods of calculus, becomes more complex because the multitude of global economic relations for which it must find a representation. [2]Other difficulties which appear in international comparisons are determined by the insufficient elucidation of some notions, the incomplete and doubtful of some basic published data, the difficulties of conversion of data computed in national currencies, in a single comparison currency etc. All these have the role of decrease the number of used indicators and induce the necessity to complete the quantitative with qualitative analysis, capable to identify even those aspects which are essential but hard to quantify.

The relations between states determined in an essential manner the problem of international comparison, in the conditions in which these have a rational base and the national participation is free. So, we can say the relations between countries are determined, in principal, by two groups of factors: factors with permanent actions and structural factors. From the first category the most important factors is the level and the volum of national economy, the level having an influence directly proportional about the exterior dependence, while the volum has an inversely proportional influence on the national economic dependence from the exterior.

Although we can say that the structure of national economies depend on the level of economic development, the structural factors can be treated in an independent manner, about the prism of their effects independent from level. So, we can talk about the structural contradiction between production and consumption, with the meaning that any country in the world as much developed as it is can't assure such kind of production structure which covered wholly the national consumption. So appears the tendency for a permanent diversity of production, which is materializing in a more large structure from a period to another. This structural diversity is limited at the national level, by the limited character of the resources (natural resources, capital resources etc.), by the economic efficiency, by the results of scientific research etc. Also, the economic structure has a complex character which in comparison with the economic dependence from the exterior must approached under two aspects which are, on the one hand, a complex structure supposes that different production activities becomes reciprocal commodity market and sources of raw material increasing in this way the capacity of national market to absorb the intern production and, on the other

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[2] Biji, R. E., Lilea, E., Roşca, R. E., Vătui, M., *Statistică aplicată în economie*, Editura UNIVERSAL DALSI, Bucureşti, 2000, p. 471

hand, the national economic development supposes the participation at the global economic circuit and the increasing of the dependence from the exterior.[3]

In international comparison studies are taken into consideration the indicators which measure the structure of national economy of compared countries, but their singular analysis is insufficient because can appear errors. So, for example, some countries with advanced economies, such as United Kingdom, Ireland, Australia, Denmark, New Zeeland have an important agriculture sector, although the weight of gross domestic product created in agriculture in the total of gross domestic product is unsignificant. Also, the prices system can concealed or deformed the real essence of macroeconomic phenomena analysed by the international comparison studies. In some recent developed countries such as Mexico, Venezuela, Hong Kong, Singapore etc., the weight of gross domestic product created in industry in total gross domestic product is greater than some of the most developed states in the world. This is the effect of lagging behind of services and agriculture sectors and also of prices system which have an important role in development of industry.

In the international comparisons are used near by the result macroeconomic indicators also physic production for some basic products of industry and agriculture, some social and quantitative indicators which lead to the conclusion that the global economic reality is so complex that obliges at a multi-size research of the phenomena and processes for obtainment real comparison between states.

The characterizing of the economic growth level of a country is materialized in the knowledge of some basic aspects, which refer to: the development level of fixed capitals (volum, structure, quality and efficiency of fixed capitals, efficiency of natural resources); the degree of use of human resources, express by the level of training and the labour productivity; the indicators of national economy structure, which characterize the degree of variability and integration of the activities; the structure and the quality of extern economic activities.

The approach of these complex aspects come true by the construction of a synthetic indicators system, computing in international statistics, which assure a broad international comparison under quantitative and qualitative aspects.

During the time, at the global level, the different production economic systems have determined the construction of two different systems of national accounts which are: the Material Production System (MPS) and Standard National Accounting System (SNAS). Today, although the prevailing is the second system, because it is specific for the countries

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[3] Anghelache, C., lucrarea citată, p. 25

with market economy, the problem of international comparisons remain highly complex and separated on more plans which are:[4] depending on the evidence system used and the level of development in studies countries we can realize: international comparisons between countries with the same system of macroeconomic calculus, international comparisons between countries with different systems of macroeconomic calculus and international comparisons between countries with different levels of development; depending on the content of the characteristics and compared processes in macroeconomic statistics are realized dynamic and spatial comparisons.

The bilateral and multilateral comparisons can realize by comparison the relative, dynamic and structure indicators such as: the gross domestic product growth rate, the labour productivity rate, the activities or sectors contributions at the forming the GDP or by the comparison of level indicators such as the value of gross domestic product or expenses in a year. This difference is important because in case of structure and dynamic comparisons if the definitions and the drafts are identical, the express of the indicators in a currency isn't necessary, different from the case in which are compared level indicators. In this situation the compared indicators are expressed in a single currency, which supposes a fresh computation of the compared indicator. In the case of a bilateral comparison the indicator which is compared is calculated again in the currency of one of the compared countries.

The countries with market economy apply prevalent SNAS and the comparison between these countries concerning GDP didn't put special problems because the concepts and the definitions on which are substantiated national calculus don't present significant differences. The major difficulty in international comparison of the gross domestic product results from the necessity of finding a commune base for comparison, respective the expression of indicators in the same currency. In this case for the ensuring the comparison of indicators can be applied two methods which are: the currency rate of exchange and the parity of purchasing power and the index of physical volum.

The problem of establish currency rate of exchange and of parity of purchasing power is studied by the international economy, as an activity of applied economy which has as the studied object the economic relations between nations using, in principal, basic drafts of economic theory.

Currency rate of exchange is the price at which a national currency can be changed with another currency (when the transaction is permitted). In the terminology of international

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[4] Anghelache, C., *Statistică. Teorie şi aplicaţii*, Editura Economică, Bucureşti, 1998, p. 295

economy, the growth or the decline of currency rates of exchange represents still an ambiguity, preferably being to talk about the prices of currency. Generally if is appreciating that a reduction of the rate of exchange has produced, this means that the currency price in the considered country becomes bigger so an unit from the national currency values less than in a previous situation so an increase of the currency price represents for the reference country a decreasing of the currency price in comparison with the rest of the countries.

On the currency market is operating with more rates of exchange such as: crossed rates of exchange, nominal and real rates of exchange, adjusted rates of exchange about the ratio parity of purchasing power/prices, rates of exchange at term and at sight.[5]

For the understanding the *crossed rates of exchange* must emphasized that exist so many rates of exchanges at sight for a country how many partners of exchange with independent currency exist in reference country so exist a rate of exchange dolar-euro, a rate of exchange dolar-yen etc. Practical is both useful and efficient to talk in the terms of a single rate of exchange, because all others are aligned by arbitration. So, for example, if is known the rate of exchange dolar-euro and the rate of exchange euro-yen is easy possible to compute exactly or with a little approximation the rate dolar-yen, the commission of the foreign-exchange dealing being generally minor.

Until in '70 when appear the *floating rates* many countries have register par values of the national currency at International Monetary Fund in according with previsions of the settlement from Bretton Woods. Such a par value represents the official rate of exchange. But in time countries having restraint to devalue their currency and they imposed taxes on transactions or overtaxes on the purchases of currency. This made necessary the distinction between the *nominal rate of exchange* (for example, the rate announced by IMF and considered as official rate) and the *real rate exchange* which reflects the effective prices (real prices) payed and received by tradesman in the currency exchange. Once with the appearance of overtaxes of exchange has appeared the effective rates of changes, different for each category of transaction. In the last time under the conditions of flexible rates has appeared and spread a second signification for the term of real rate of exchanges, according with that the real rate is the weighted mean of rates of exchange used by the commercial partners of respective country.

So, a country which must take into consideration in the same time the increase of some currencies and the decrease of other can compute an average of the rates of exchange

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[5] Krueger, O. A., *Determinarea cursului valutar. Determinarea ratei de schimb*, Editura SEDONA Timişoara, 1996, p. 22

using as weight the ratio of trade with these countries and considers it as a real rate of exchange. Some important countries in the trade domain leave the rates of exchange to fluctuate and to be established in part by the market. However a number of countries with a small importance in the world trade continue to establish the national currency in function by the currency of a developed country or in function by a basket of currencies. Because the overtaxes still can be imposed, even in these cases the concept of real rate of exchange is useful in making the difference between official rates and relevant rates in taken the decisions.

When a country confronts with a hyperinflation is necessary to make a distinction between the nominal and real rates of exchange and their real correspondent. A relevant concept for real rate of exchange is the nominal rate adjusted at the differences between the rate of inflation in the reference country and in the partner country. So, the rate of exchange computed as a ratio parity of purchasing power/prices is the rate of exchange divided by the price index number in the reference county and multiplied by the price index number in the partner country.

The rate of exchange at sight is the rate which is used for the buying and sales effected in the moment in which the rate is quoted. The rate of exchange at term is the rate used for the buying and sales contracts of a currency in a future moment.

In international comparisons, in the case of using the floating rates for the fresh computation of indicators is operating with an average of rate of exchange and the fresh computation is realized by divided the gross domestic product expressed in national currency at the rate of exchange.

The parities of purchasing power are computed in function by the followed purpose such as: if is necessity the comparison between the global indicators (GDP, GNP) are determined total parities and if the comparison is based on indicators with a restricted content (private consumption, final consumption, gross forming fixed capital etc.) are determined specific parities. The difference between two types of parities is given by the classified list of goods and services contain in the sample used for computation the parity of purchasing power. The problems which appear in the application of this method is connection with: the choice of type of price index number, the choice of comparison basis, the establish of the goods and services sample etc. For the space comparison it can be used price index numbers such as *Paasche price index number*, *Laspeyres price index number* and *the Fisher's average index number*, an index number which eliminate the influence of weights.[6]

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[6] Biji, R. E., Lilea, E., Roşca, R. E., Vătui, M., lucrarea citată, p. 476

In the international bilateral comparisons appeal frequent at physic volum index numbers, which express how many times the compared indicator was bigger or smaller in a country compared with another country from the physic volum point of view.

Some methodological specific problems appear in case of multilateral comparisons, being generated by the fact that by choice the considered country as comparison basis, gross domestic product and the currency of this country is compared with the gross domestic product of all other compared countries. After the establish comparison basis every county is compared first with the comparison basis and than through this are compared the others countries. Though the method has theoretic and methodological base in practice it isn't recommended because the order of countries after gross domestic product is changeable depending on the exchange of comparison basis. Also the physic volum index numbers and the prices index numbers used in international comparisons must to satisfy some tests, one of these being the test of independence of results face to the selected comparison country. A solution for this problem offered by the International Project of Comparison UNO and European Commission is to use a method which is based on a fictitious country and a middle basket of goods formed on the base of samples of every compared country, depending on that is computed the average prices for goods and parities for every country.

If is compared the results of economic activities between countries which applied different macroeconomic calculation systems must take into consideration the essence of difference between the indicators computed in these two systems, determined by the two different theoretical conceptions concerning the content of indicators. In SNAS the computed indicators contains the results of all the activities from economy, while the computed indicators in MPS are obtain by estimate the results of activities from realization of material goods and services, the difference between these two groups being given by the value of nonmaterial services. This difference is finding again in the content of the indicator intermediate consumption. In SNAS the intermediate consumption includes the expenses with material consumed goods and services for the production of other nonmaterial goods and services. So, the intermediate consumption in SNAS includes in addition the content of the indicator in MPS two elements which are:[7] the intermediate consumption in activities which have as results nonmaterial services; the consumption of nonmaterial services in goods used for production of material goods and services.

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[7] Capanu, I., Wagner, P., Mitruţ, C., *Sistemul Conturilor Naţionale şi agregate macroeconomice*, Editura ALL, Buucreşti, 1994, p. 107

In time many appeared papers make an analytic presentation of differences between these two systems and offer solutions for the difficulties concerning with the different contents of the indicators. But there are some difficulties generated by the way of formation of prices in these two systems. So, in the countries which applied MPS the prices was established by administration and they are used to lead the consumption and the production. Because even the currency rates of exchange was established official, without a connection with the world market prices is probable to appear difficulties in the estimate of goods and services in one currency. In these conditions the currency rate of exchange can't be used to calculate again the gross domestic product. Similar difficulties appear in computing the parity of purchasing power, determined by the different conception concerning the value of some goods which can determine fundamental differences in the prices structure. In the structure comparisons, although isn't necessary the expression of indicators in one currency using the currency rate of exchange or the parity of purchasing power, these suppose the elimination of differences in the limiting of sectors of economy.[8]

The comparison of gross domestic product between countries with different levels of development raise some additional problems which results from the different economic and social structure of these two types of countries. The common characteristic of the countries in development is the concomitant existence of an industry sector and a agriculture sector (sometime predominant) in their economy. In the agriculture sector a great part of population is occupied with the production of subsistence, which almost eliminates the commercial activity. Such a structure of economy makes more difficult the statistics analysis concerning with the estimate of transactions, because didn't exist reliable information concerning the produced amounts and their prices. Also, for the estimate the agriculture production can't be used the prices registered for these products in urban environment because between these two environments exist differences concerning with the way of life, the customs of consumption etc. The public sector in these countries is in the same time the producer of public goods, the producer of electric power, the owner of hard industry etc. This position makes difficult the esteem concerning the way of prices estimation (about the market principles or not). If in the countries in development o part of mention activities are subsidized, the value of industry production will be underrated comparative with the developed countries.

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[8] Roşca, R. E., *Unele aspecte privind comparaţiile în timp şi spaţiu a indicatorilor macroeconomici*, International Conference on Economic Cybernetics. The Cybernetics of Macroeconomics, ASE Bucureşti, 22-24 aprilie 2004

In conclusion, the problem approached has followed to emphasize the necessity of realization of international comparisons, required by the increased of international division of labour and the economical dependence between countries, but also some of difficulties which appear in the realization of the international macroeconomic comparisons.

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