WCIT 2010

Interdependence of World Markets: Economic Growth and Social Well-being

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Abstract

This paper considers the socio-economic world context in 2009 and is aimed at achieving two goals: on one hand, to carry out an economic quantitative analysis of interdependence of the world markets; on the other hand, to investigate the relationship between economic growth and social well-being.

In order to reach the first aim, we use, as a starting point, Wallerstein's *World Systems Theory* (1982) presenting a hierarchical but unfixed division of the world in three levels (*core*, *semi-periphery* and *periphery*); then we consider a group of 124 countries and assign each of these country to one of the three areas. The assignment has been realized by looking at the total score achieved by each country, with the addition of the partial scores based on the position occupied in three different rankings which consider three distinct economic indicators each of them has been divided by the population size (real GDP, exports and debt-external).

Therefore we proceed by reaching our second goal concerning the examination of the nature of the relationship existing between the level of each country's participation in the world economy and its social well-being. We have decided to calculate the *Physical Quality of Life Index* (PQLI) in order to show the level of well-being gained by each country considered. The PQLI was created by M. D. Morris (1979) to satisfy the need of constructing new indexes to overcome the limitations of economic parameters for measuring human development, which were highlighted by the social indicators movement of the 1960s and by very important works produced by Amartya Sen (1985, 1987, 1999). The construction of PQLI for each country has given us the possibility of comparing the results of the first part of our work with those coming from the second part, in order to focus on the relationship between economic growth and well-being.

The results obtained have further been underlined by using a selected group of 9 countries reflecting the main trends which characterize the entire group of countries. In conclusion, the findings of this study reveal that the relationship between a high level of economic growth and an advanced degree of social well-being is not necessarily a cause/effect relationship because it may not occur in consequence of historical, cultural, social and/or political contingencies.

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Selection and/or peer-review under responsibility of the Guest Editor.

Keywords: economic growth; social well-being; World Systems Theory; Physical Quality of Life Index (PQLI); international hierarchy.

JEL classification: B23; C02; F01; F02; I30; O57.

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1. Introduction

The current socio-economic world context is characterized by a strong interdependence between markets which ties the world countries among them. This interdependence is expressed in a hierarchical relationship between the different countries of the world which is based on the level of wealth generated through its own economical system and on the power that country consequently has to influence the world market thanks to its own level of wealth. These hierarchical relationships have been well identified by I. M. Wallerstein's *World Systems Theory* [1] aimed at highlighting the general effects of capitalism on a world level. Wallerstein's *World Systems Theory* not only lets us outline the relationships of interdependence between markets that bond countries of the world to each other but also to reveal the level of economic growth reached by each country throughout 2009. This becomes particularly useful to achieve the two objectives of this piece of research. Starting with the socio-economic world context in 2009, we intend firstly, to give an economic quantitative interpretation of the relationship of interdependence between the markets that tie the countries of the world to each other, and secondly, to investigate the relationship between economic growth and social well-being. To reach the first goal, we give an economic quantitative description of the model proposed by Wallerstein, while to achieve the second objective we have decided to use the Physical Quality of Life Index, *i.e.* PQLI, (composite index elaborated by M. D. Morris [2] in order to respond to the growing necessity in developing new parameters that overcome the limits represented by measurements which take into account only the quantitative capacity of generating wealth) so as to compare it with the results obtained from the first part of our study. This piece of research is a first step towards an analysis of the relationship between economic growth and social well-being which we intend to investigate further through a future long-term analysis.

In order to achieve our objectives we have structured our paper in the following way. In the second section, we explain Wallerstein's World System Theory, its use in our study and we give an economic quantitative description of it using appropriate economic indicators referring to the year 2009. To achieve this objective we have chosen a sample of 124 countries. The dynamics revealed by the countries considered have been further emphasized through a sample group of 9 countries. The data necessary to carry out the study described in section 2 - as well as the data used in the study described in section 3 - come from the World Factbook [3] published on line in January 2010 by the Central Intelligence Agency (CIA) on its own website. In section 3, firstly, we show the reasons for which we decided to use the PQLI to represent social well-being in a quantitative manner, secondly, we calculate the PQLI reached in 2009 by the124 countries analyzed. Finally, in section 4, we conclude our study cross-referencing the data coming from section 2 with those described in section 3 with the aim of highlighting the relationship between economic growth and social well-being. The type of relationship we have been able to describe has been further studied using the representative sample of 9 countries which has been used in section 2. In the conclusions, we emphasize both the results gained and the fact that they may be a starting point for further long-term studies and for considerations of economic policy which call for a multi-disciplinary approach which sees economic science working with other fields of science in a situation of reciprocal benefit.

2. Interdependence of markets and economic prosperity in the 2009 world system

In order to describe the relationship of interdependence which bond world countries to each others we have decided to use Wallerstein's World System Theory. This theory has its preceding historical theories dating back to the XIX century, in the economic field, in the J. T. Von Thunen's model [4] and that of W. Christaller [5] which will be taken into consideration by the following Marxist and neo-Marxist theories. In the development of Wallerstein's theory to depict the world economy a major role was played by the results of research conducted in the field of economics, sociology, history and geography. The World System Theory considers the all world economy as one market system in evolution, in which the economic hierarchy of countries is the result of long-term economical cycles which dominate the dynamics of the system itself. To fully understand the essence of this theory we must focus on four key concepts: economic growth, interdependence, hierarchy and dynamism. The world's countries can be divided into three groups on the level of economic growth they have reached: *core*, *semi-periphery* and *periphery*. Following we define the particular characteristics of the three typologies referring to Wallerstein's studies and the comments made by Vanolo [6], Knox and Agnew [7], Timberlake and Lunday [8] and we describe the three groups emphasizing the particular aspects highlighted by Wallerstein of which the level of economic growth achieved is one of the fundamental discrimination point.

The *core* is characterized by politically strong government systems as well as by strong domestic markets and by an economy with relatively high remuneration, advanced technology, a highly diversified productive mix and a high degree of international competitiveness. The countries belonging to the *core* are characterized by highly functional coordination which leads to a more efficient exchange and pooling of ideas, services, information than elsewhere; moreover, there is innovation and evolution of productive, technological and social systems. The *periphery* is characterized by weak government systems and an economic framework with little or no power to influence the international markets due to its poorly diversified production activity with low remuneration which is labour intensive and because of the use of a much more rudimental technology compared to that used by *core* countries. Therefore, the countries belonging to the *periphery* group find themselves having to bear the international economical choices of the *core* countries as well as having little or no power in negotiations. Finally, these countries have a reduced or inexistent potential to establish contacts. The s*emi-periphery* is characterized by a combination of both the characteristics of the *core* and those of the *periphery*. Generally, the *semi-periphery* includes the countries tied to international economies by their more recent industrialization or their agricultural activities. It is characterized by technological, financial and decisional dependence on the *core* and by a less complex communication system than that belonging to the *core*. As it is possible to deduce from the description given, the three groups are linked to each other by a hierarchical and interdependent relationship based on the level of economic growth achieved thanks to the more or less strong possibility to take part in the world market. The dynamism is one of the essential aspect which describes the nature of the *World Systems Theory*. Indeed, the hierarchical relationship we have described is not static but highly dynamic to such an extent that one country belonging to the *periphery* may pass to the *semi-periphery,* and then to the *core* and in time the opposite passage may happen as well from the *core* to the *semi-periphery,* and then to *periphery*. This condition of passage as well as the possibility of evolution or involution are well represented by the *semi-periphery* which is an intermediate level between *core* and *periphery*. Following we give a economic quantitative description of the 2009 world system in order to show at the same time the interdependence of the world markets and the level of economic growth achieved by each country considered. With the aim of describing the 2009 world system, we have selected a sample composed of 124 countries which have been chosen among the 256 economic and political units described by *The World Factbook* to which from here on we refer to by using the abbreviation in brackets (WF). The remaining units out of the 256 described by WF have not been taken in consideration due to two reasons. First, some of them are territories or dominion administrated by one specific country so that the wealth they produce belongs to the country whose control they are under; second, one or more of the indicators taken in consideration are not available for the 2009 year. The attention paid to respect the second criteria is based on our aim to guarantee the comparability of the data set as well as to give a description of the 2009 level of economic growth.

After having collected the sample of countries, we have assigned each country to one of the three groups which compose the world system: *core*, *semi-periphery*, *periphery*. This ascription has been carried out on the basis of three following indicators describing the domestic economic conditions of the countries belonging to our research field: the real Gross Domestic Product (GDP), the Exports Level (EL) and the External Debt Level (EDL) which we refer to by adopting the definitions contained in WF. These indicators are highly useful to achieve the objectives of our comparative analysis due to their effectiveness in describing not only the wealth generated by a country but also its level of participation in the world economy as well as its ability to interact with the other countries in the world markets. In particular, the GDP reminds the total value of goods and services produced in a country's economy; the EL showing the level of goods and services exported abroad indirectly gives a description of to what extent the country considered takes part in the world market and the degree of wealth that comes from such participation. Finally, the EDL explains how the level of economic growth realized by a country depends also on the financial capitals which that country has borrowed from other countries in order to supply its need for additional incomes, so that, synthetically, this indicator in providing an indirect evidence of the country's dependence on the other countries' economies gives us another perspective of the possible positive values represented by the GDP and the EL. All these indicators have been adjusted by dividing them by the population number. In this way we have obtained the following three values to which from here on we refer to by using their abbreviations in brackets: the real Gross Domestic Product per capita (GDP pc), the Exports Level per capita (EL pc); the External Debt per capita (ED pc). Then we have ascribed each country considered either to the *core,* or to the *semi-periphery* or to the *periphery*. In order to achieve this objective we have ranked the 124 countries according to the value reached for each of the three indicators so that we have obtained three scales. Then each of the three scales has been divided into three rankings based on the values registered and on the position occupied on the scale by each country. Then, we have given each ranking a score either of 2 or 4 or 7. The more positive is the situation described by the ranking for the country then the score will be higher for that country.

On the GDP pc scale, the countries are ranked in a descending order based on their respective GDP pc given in US dollars. This scale has 99 positions because groups of two or three countries have achieved the same score. The first ranking runs from the 1st position (121400) to the 33rd one (18800); the second ranking goes from the 34th position (17800) to the 65th position (7300) whereas the third ranking includes countries from the 66th position (7100) to the 99th ranking (900). The countries belonging to the first ranking have received 7 points; 4 points have been given to the second ranking, whereas those in the third ranking have been attributed 2 points.

On the EL pc scale, the countries have been put in a descending order based on their respective EL pc expressed in US dollars. The scale has 123 positions since Bangladesh and Pakistan have achieved the same EL pc. The first ranking goes from the 1st position (52603) to the 43rd position (3238); the second ranking runs from 44th position (3012) to the 81st position (684); while, the third ranking includes countries from the 82nd position (670) to the 123rd position (19). The countries in the first ranking have been attributed 7 points; those ranked second have been given 4 points and those of the third ranking have been attributed 2 points.

On the ED pc scale, the countries have been ranked in an ascending order based on their respective value of ED pc expressed in US dollars. The scale consists of 121 positions given that three pairs of countries have obtained the same value: Algeria and Madagascar (99), Lesotho and Yemen (273), Moldova and Thailand (919). the first ranking stretches from the 1st position (50) to the 41st position (641); the second one runs from the 42nd position (798) to the 81st (4122) position. Finally, the third ranking includes countries from the 82nd (4298) position to the 121st position (4054700). Countries belonging to the first ranking have been given 7 points; 4 points have been attributed to the second ranking, whereas those in the third ranking have received 2 points.

After having assigned three partial scores to the 124 countries analysed on the basis of the ranking occupied on each of the three scales by using the method described above, we have added up the three partial scores. And so nine new scores have been obtained: 8, 10, 11, 12, 13, 15, 16, 18, 21. These scores have been grouped into threes: the first group (16, 18, 21), the second (12, 13, 15) and the third one (8, 10, 11). The first of these groups of threes represents a situation of elevated economic growth and of high participation in the world market (*core*); the third of these groups indicates a situation of economic underdevelopment (*periphery*) while the second of these groups denotes an intermediate situation between that described for the first grouping and that has been described for the third (*semi-periphery*) as it is possible to see graphically in figure 1.
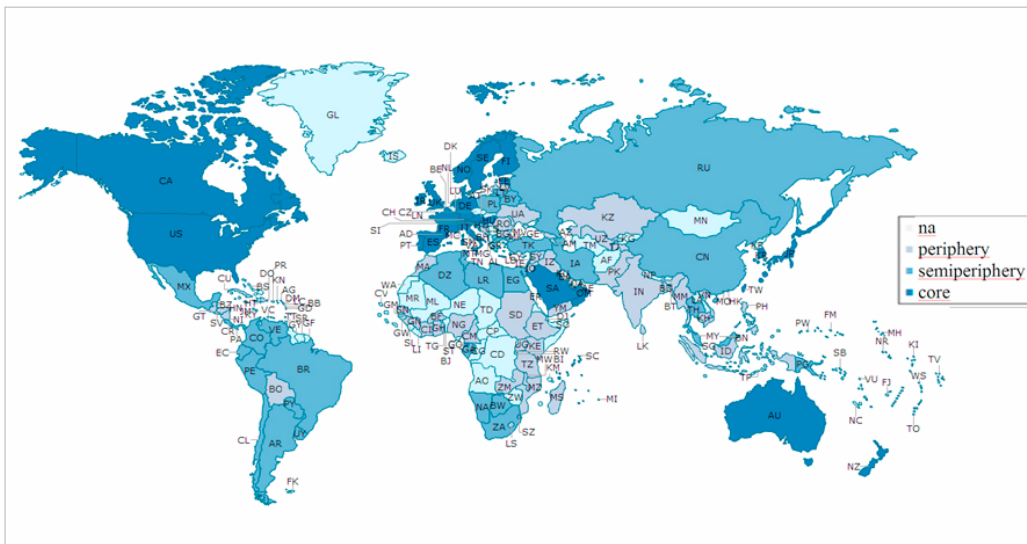

Fig. 1 – The 2009 world system (source: our elaboration on CIA data, January 2010).

The difference of just one point between the highest score attributable to the *periphery* (11) and the first score attributable to the *semi-periphery* (12) together with the same difference in value of one point between the highest score connected to the *semi-periphery* (15) and the lowest score given to the *core* (16) demonstrate how the classification into *core*, *semi-periphery* and *periphery* has both an hierarchical and dynamic nature because, as also

described by Wallerstein, this classification can be influenced by changes in the interdependence of markets due to choices in national and/or international economic politics.

Summing up, thanks to the nine scores obtained, we have been able to attribute each country to one of the three groups under consideration. The countries with a score spanning from 8 to 11 belong to the *periphery*, those from 12 to 15 fall into the *semi-periphery*, and finally, those between 16 to 21 can be classified as *core*. On the basis of what has been described so far, we are now able to give a graphical representation of three divisions of the 2009 world system in figure 1.

At this point from the sample selected, we have isolated a more specific subsample based on the results achieved in the preceding analysis with reference to the scores tied to the groups. This has been done in order to achieve the three following goals. Firstly, to give an example of the methodology used to rank the countries analysed; secondly, to isolate three countries which will exemplify each group under study. Each set is formed by three countries to show the three different range of scores possible within each group. Thirdly, the identification of the nine countries will be necessary to satisfy the needs of the second part of our research in which we will investigate the kind of relationship that runs between economic growth and social well-being. The countries of the more specific sample which we will refer to from here on by abbreviation in brackets are: Saudi Arabia (SA), China (CN), Iran (IN), Iraq (IQ), Malta (MT), Great Britain (GB), Sudan (SD), Uzbekistan (UZ) and Venezuela (VE).

Figure 2 shows the partial scores given to the nine countries on the basis of the ranking occupied in the three scales which we have used to compare the 124 countries according to their GDP pc, EL pc and ED pc. Indeed, following the previously described methodology, it has been possible to convert each ranking into a partial score in order to proceed to add up the partial scores and obtain a final value used to attribute each country into one of the three groups (this can be seen in figure 2).
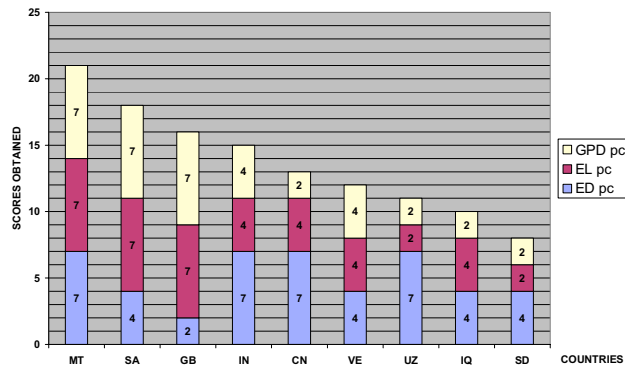

Fig. 2 – Nine countries compared on the basis of their GDP pc, EL pc, ED pc partial scores (our elaboration on CIA data, January 2010).

To illustrate what we have just asserted we take SA as an example. SA occupies the 31st position on the GD pc scale and thus has obtained a first partial score of 7 points being the score attributed to the ranking which spans from the 1st position to the 33rd position. SA obtained a second partial score of 7 points due to its 28th position on the EL pc scale; in fact, in this scale, the countries belonging to the ranking running from the 1st position to the 43rd position receive 7 points. The third partial score of 4 points has been given on the basis of its occupying the 71st position on the ED pc scale; in fact, as far as the ED pc scale is concerned, 4 points are assigned to countries from the 42nd position to the 81st position. The same of three partial scores 7 (GDP pc), 7(EL pc), 4(ED pc) has given a total score of 18 which has put SA in the *core* group because this group includes countries with scores from 16 to 21. The same criterion has given MT and GB position in the *core* due to their respective total scores being 21 and 16. Since a total score between 12 and 15 puts the country into the *semi-periphery*, it has been possible to give IN, CN and VE a place in the *semi-periphery*. Their respective scores being as follow: VE(12), CN(13) and IN(15). For the same reasons, SD, IQ and UZ with respective scores of 8, 10 and 11 fall into the *periphery* which includes countries with score of 8 to 11.

3. Social well-being in the 2009 world system

The research seeking to show the social well-being situation in the 2009 world system has arisen the problem to choose a reliable quantitative indicator to represent the 'social well-being' variable. Indeed, economic indicators such as GDP or GNP are extremely useful to measure the level of economic growth achieved by a country but, at the same time, they are not very good at describing the degree of social well-being reached by it. This discontent arose in the 1950s and 1960s and it was expressed, for example, by the UN report on the international definition and measurement of the levels of living [9] as well as the growth of the social indicators movement of the 1960s in the US. Hilhorst and Katter's work [10] as well as Newman and Thomson's study [11] highlight the efforts focused on measuring the human development not only by using economic indicators but also by developing new indicators capable to give also evidence of the social occasions people can count on in order to improve their living conditions. So that, there is the rise of new ideas of development where wealth is not to be seen as the ultimate aim but only as a means to improve social well-being. The climax of these new considerations is represented by Amartya Sen who develops the *capability approach* [12], [13], in order to fight against the tendency to judge the development in terms of GDP growth and to define poverty as lack of means of subsistence. The *capability approach* is based on the following two concepts: *functionings* and *capability set*. Sen [14] defines *functionings* as "*the various things a person may value doing or being [...] such as being adequately nourished and being free from avoidable disease, to very complex activities or personal states, such as being able to take part in the life of the community and having self-respect*", whereas the expression *capability set* makes reference to the group of *functionings* a person can choose from. Therefore, this approach bases the idea of social well-being on the capability set as well as on the freedom a person has in terms of putting into act her or his own way of life. Consequently, poverty is defined as capability deprivation rather than lack of income. This consideration lets us research a reliable index to describe the level of social well-being achieved by our sample of countries. We have chosen the *Physical Quality of Life Index* (PQLI) because, firstly, it fits the definition of social well-being adopted in this work, and secondly, it can be elaborated thanks to the CIA data set. In this section, we present the results coming from the analysis of the PQLI elaborated for each country. Then, in the next section, these findings will be compared with those reported in the previous section. The PQLI was created by M. D. Morris in the mid-1970s encouraged by J. P. Grant, who subsequently became UNICEF's Executive Director from 1980 to 1995. In order to show the methodology used to elaborate the PQLI we will make reference to the description provided by its creator, to N. van der Lijn's empirical analysis [15] and to the PQLI definition given by *Collins Dictionary of Environmental Science* [16]. The PQLI is a weighted average of indexes of life expectancy at age one, infant mortality and adult literacy and the same importance is given to each of these three indexes. The infant mortality index gives the number of deaths of infants under one year old in a given year per 1,000 live births in the same year; the adult literacy index refers to the number of people aged 15 and over who can read and write. The choice of using the index of life expectancy at age one instead of that of life expectancy at birth is based on the will to give more weight to the rate of infants under one year of age relative to the mortality rates of the other groups in order to make PQLI more fully representative of to what extent the country considered is able to meet its basic needs. With the aim to construct the life expectancy at age one index we have applied the following methodology, described by N. van der Lijn, to the data for life expectancy at birth and infant mortality:

$$LE(0) = (IM)(AVG)+(1-IM)LE(1) \tag{1}$$
or
$$LE(1) = [LE(0)-(IM)(AVG)] / (1-IM) \tag{2}$$

Where *LE(0)* is life expectancy at birth, *LE(1)* is life expectancy at age one, *IM* is the number of deaths of infants under one year of age divided for the total number of live births, and *AVG* is the average time infants live who die in their first year of life. The 'rule of thumb' among economists and demographers is that *AVG* is about a quarter of a year in countries with high infant mortality, and about half a year for countries with low infant mortality. In the calculation, *AVG* was considered to be 0.25 for countries with an infant mortality rate of 100 per thousand live births or more, 0.5 for countries with an infant mortality rate of 10 per thousand live births or less, and in between 0.25 and 0.5 for countries with infant mortalities rates in between 10 and 100 per thousand live births (*e.g.* for *IM* = 0.028, *AVG* = 0.45; for *IM* = 0.046, *AVG* = 0.40; etc.). The data coming from each of the social indicators we have described are then rescaled on a scale from zero to 100 where zero represents the minimum value and 100 the maximum one, with the exception represented by the rescaling of the life expectancy at age one data where zero represents the maximum value and 100 the minimum one. Consequently, the intermediate values will receive a score running from 1 to 99. The minimum values as well as the maximum ones for each social indicators describing our sample of countries are represented in table 1.

Tab..1 – Minimum and maximum values for each social indicators used to calculate the PQLI (our elaboration on CIA data, January 2010).

Index	Minimum	Maximum
Life Expectancy at age one	42.95	82.35
Infant Mortality (per 1000 live births)	2.31	105.80
Adult Literacy (%)	21.80	100.00

The minimum value concerning the life expectancy at age one (42.95) belongs to Zambia whereas the maximum one (82.35) to Japan. Singapore achieved the minimum value (2.31) tied to the infant mortality while the maximum one (105.80) was gained by Mozambique. Finland, Georgia, Luxembourg and Norway have reached the highest percentage of adult literacy (100%) whereas Burkina Faso has registered the lowest one.

At this point, it is necessary to adopt the following expression in order to find the PQLI:

$$PQLI = (IM_i+LE1_i+AL_i)/3 \tag{3}$$

in which IM_i is the infant mortality, $LE1_i$ represents the life expectancy at age one and AL_i the adult literacy rate; *i* stands for having rescaled all of the three social indicators on a scale from zero to 100. Hence, the PQLI value will run from zero to 100 since it is the result obtained by the average of IM_i, $AV1_i$ and AL_i. In order to interpret the PQLI value, it is important to remember that PQLI < 77 shows a reality where the human basic needs are not satisfied. The methodology described has been used to calculate the PQLI for each country considered so that we have been able to show the social well-being in the 2009 world system represented by the 124 countries considered (see figure 3).
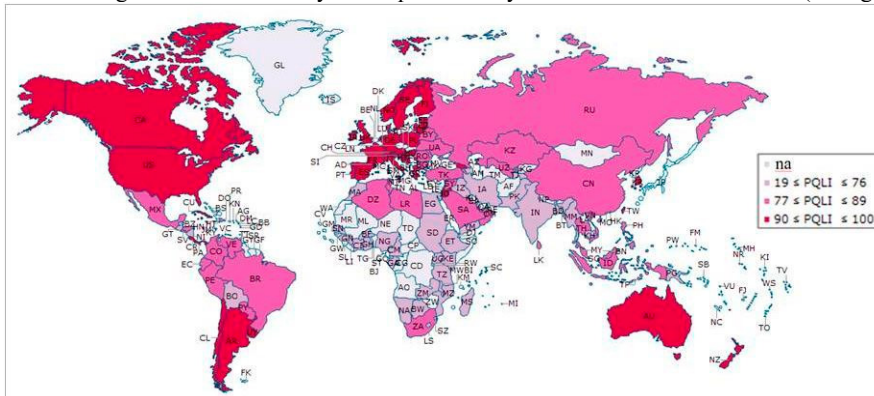

Fig. 3 – The PQLI levels in the 2009 world system (source: our elaboration on CIA data, January 2010).

4. The relationship between economic growth and social well-being in the 2009 world system

The data collected and shown in the previous sections allow us to illustrate the kind of relationship existing between the level of economic growth and the degree of social well-being achieved by the countries belonging to the sample selected. More specifically, we show how the PQLI level changes according to whether it is referred to a country belonging to either the *core* group (cG), or the *semi-periphery* group (sG) or the *periphery* group (pG) which have been described in the section 2. In order to achieve this objective, we have firstly found the average PQLI (avPQLI) for each of these three groups: the avPQLI for cG is 93, the sG has an avPQLI of 82, whereas 66 is the avPQLI for the pG. Secondly, we have revealed the presence of PQLI < 77 in each of the groups considered since this value describes situations where the human basic needs are not met. The percentage of PQLI < 77 is 3% in the cG, while it reaches 22% in the sG, and then it rises up to 57% in the pG. Finally, these revealed percentages have allowed us to observe that, on one hand, the avPQLI value decreases from the cG to the pG and it registers an intermediate value in the sG (as shown in figure 4a), and, on the other hand, the percentage of PQLI < 77 significantly increases from cG to pG and it shows an intermediate value in the sG (as seen in figure 4b).
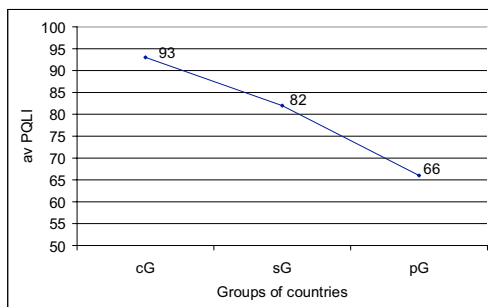
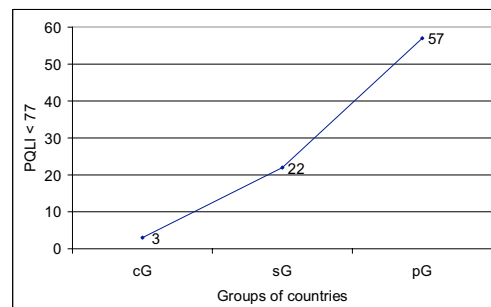Fig. 4. (a) The different avPQLI levels of cG, sG, pG.   Fig. 4 (b) Percentage of PQLI < 77 in cG, sG, pG.

All this allow us to observe that there is a correspondence between a high level of economic growth and an advanced degree of social well-being but, at the same time, this correspondence can not be necessarily defined as a cause/effect relationship. Indeed, some of the countries belonging to pG have a PQLI value running from 78 to 88, and another small group of countries coming from pG have a PQLI level between 90 and 95. Moreover, the Equatorial Guinea situation can be seen as a meaningful example of this. In fact, Equatorial Guinea is the only country belonging to cG whit a PQLI < 77 (57), and this value becomes much more significant if we remember that this country has achieved the highest score (21) among those scores (16, 18, 21) which are necessary to be placed in the cG.

The nature of the relationship between economic growth and social well-being can be described much more accurately by using the nine countries subsample we have drawn in section 2. Specifically, we underline the nature of the relationship between the PQLI of each of the nine countries and their belonging either to the *core* or to the *semi-periphery* or to the *periphery*. We have divided the nine countries into three small groups according to their belonging, so that the first group (cG3) is composed by GB, MT and SA which are *core* countries whose respective PQLI levels are 96, 95 and 86; the second group (pG3) includes VE, CN and IN belonging to the *semi-periphery* and their PQLI is respectively of 85, 85 and 74; then, the third one (sG3) is formed by the following *periphery* countries: SD with a PQLI of 39, IQ whose PQLI is 70 and UZ characterized by a PQLI of 74. Then, we have constructed the avPQLI for each group which we report in brackets near the abbreviation of each group considered: cG3 (92), sG3 (81) and pG3 (65). The observation of the three levels of avPQLI reveals that the avPQLI gradually decreases from cG3 to sG3 and reaches its lowest level in the cG3. This gives evidence of the general tendency to see a high level of economic growth combined to an advanced degree of social well-being, but now, our aim is to verify if that type of tendency can be defined as a cause/effect relationship. In order to achieve this goal, firstly, we have analysed the composition of each of three different avPQLI levels, and then, we have observed the relationship between the countries belonging to one of the three groups above described and their respective PQLI level. In this way we are able to make two complementary observations. First, the general tendency has not been denied; in fact, the PQLI for SD belonging to the *periphery* is 39,

that for VE and CN coming from the *semi-periphery* group is 85, and GB which is a *core* country has a PQLI of 96. Second, that tendency cannot necessarily be defined as a cause/effect relationship due to the example of UZ (a *periphery* country) with a PQLI of 86 which is the same value of that achieved by SA belonging to the *core* group, and to the fact that the PQLI for SA differs just by one unit from that for VE and CN coming from the *semi-periphery* group.

5. Conclusions

In this paper we make reference to Wallerstein's categories (*core*, *semi-periphery*, *periphery*) in order to develop a quantitative analysis without embracing the neo-Marxist implications of his theory, and we show the results coming from an empirical study whose objectives are, on one hand, to provide an economic quantitative description of the interdependence between markets which ties the world countries among themselves, and, on the other hand, to analyse the relationship between economic growth and social well-being.

We have attributed each of the 124 countries considered either the *core*, or to the *semi-periphery* or to the *periphery* by analysing the different values achieved by each country in three different economic indicators: the real GDP, the Exports Level and the External Debt which have been adjusted by dividing each of them by the population indicator. So that we are able to gain two goals. Firstly, to show the hierarchical relationship which characterizes the countries considered as well as the interdependence of the world markets in 2009. Secondly, to represent the level of economic growth reached by each country due to the fact that the division in *core*, *semi-periphery*, *periphery* is based on economic indicators created to measure economic development.

Then, we pass to investigating the nature of the relationship between economic growth and social well-being for the year 2009. The comparison between the *Physical Quality of Life Index* (PQLI) chosen to describe the social well-being level and the degree of economic growth achieved by each country has given us the possibility to demonstrate that there is a general tendency which ties a high level of social well-being to an advanced degree of economic growth. For example, Malta which has obtained the highest possible score (21) among those scores (16, 18, 21) necessary to be put in the *core* group has a PQLI of 95. But, at the same time, the data analysed have demonstrated that general tendency can not necessarily be defined as a cause/effect relationship since historical situations as well as socio-economic politics can affect that tendency. For instance, the PQLI referred to Uzbekistan belonging to the *periphery* (86) has the same value of that describing the social well-being of Saudi Arabia included in the *core* group. Moreover, Equatorial Guinea has a PQLI of 57 although it is one of the country which has realized the highest score possible for being attributed to the *core*.

Finally, we notice the importance to develop new studies to conduct a long term analysis to further investigate the dynamics characterising the 2009 world system. In fact, the world system theory presents a hierarchical but unfixed division of the world to such an extent that one country belonging to the *periphery* may pass to the *semi-periphery*, and then to the *core* and in time the opposite passage may also happen from the *core* to the *semi-periphery*, and then to *periphery*. It will be useful to compare this order of changes to the variations of PQLI and/or other social indicators in order to investigate the effects of national and international socio-economic politics on the increase or decrease of social well-being.

Consequently, the way of running of socio-economic politics has a key role in determining the nature of the relationship which bonds economic growth to social well-being. In fact, having shown that the nature of relationship between a high level of economic growth and an advanced degree of social well-being is not necessarily one of cause/effect, we have put forward the hypothesis that the critical element in determining the nature of this relationship is the way in which the dynamics of markets is geared. And hence the importance must be given to finding "*better ways of running the economy, or of structuring the economic system, or of intervening or not intervening in the economy*" **[17]** from which derive a possible normative ethics which is given the power to influence the content of socio-economic politics. These considerations have brought us to understand that the development of a country cannot be only quantitatively measured in terms of wealth generated but must be judged also taking into consideration of the increase in the quality of life to be understood as a widening of the *capability set,* that is the possibility of putting into act the life style to which you give more value and to interact in society without the risk of being excluded by it. In fact, as we are able to see for the year here taken as reference, a high level of economic growth does not correspond necessarily to an advanced degree of social well-being. This bring us to emphasize the importance of starting from quantitative analyses describing the effects brought about by the economic interdependence caused by the world market in order to develop hypotheses of ways for running socio-economic politics.

In conclusion, the research we have conducted allows us to support the importance of a methodology based on an interdisciplinary strategy in the field of economics. In fact, in this study we have put to use Wallerstein's *World Systems Theory* developed from some socio-economic observations. Moreover, the economic indicators and their interpretation have been useful to describe socio-economic dynamics and hypotheses for the way of running them based on a method which we hope will be ever more interdisciplinary similar to that promoted by Amartya Sen between economics and ethics or by Vernon Smith between economics and psychology.

References

1. I. M. Wallerstein, World-Systems Analysis: An Introduction, Duke University Press, Durham, 2004.
2. M. D. Morris, Measuring the Condition of the World's Poor: the Physical Quality of Life Index, Pergamon Press, New York, 1979
3. Central Intelligence Agency, The World Factbook, accessed on line the 14th January 2010.
4. J. K. Von Thünen, Der isolierte Staat in Beziehung auf Landwirtschaft und Nationalökonomie, Hamburg, 1826 (English edition, Isolated State: an English Edition of Der isolierte Staat di Johann Heinrich von Thunen, Pergamon Press, Oxford, 1966).
5. W. Christaller, Die Zentralen Orte in Suddeutschland, Fisher, Jena, 1933 (English edition, Central places in southern Germany, Prentince-Hall, Englewood Cliffs, New Jersey, 1966).
6. A. Vanolo, Geografia Economica del Sistema-Mondo, Utet Università, Torino, 2006
7. P. Knox and J. Agnew, The Geography of the World Economy, Arnold, London, 1994.
8. M. Timberlake and J. Lunday, Labor Force Structure in the Zones of the World-Economy, in: M. Timberlake (Eds.), Urbanization in the World-Economy, Academic Press, Orlando.
9. United Nation, Report on the International Definition and Measurement of Levels of Living, New York, 1954
10. J. G. Hilhorst and M. Katter, Social Development in the Third World: Level of Living Indicators and Social Planning , Croom Helm, Beckenham, 1984.
11. B. Newman and Thomson R., Economic Growth and Social Development: A Longitudinal Analysis of Casual Priority, World Development, 17, 1989, 461-71.
12. A. Sen, Commodities and Capabilities, Oxford University Press, Oxford, 1985.
13. A. Sen, The Standard of Living, Cambridge University Press, Cambridge, 1987.
14. A. Sen, Development as Freedom, Oxford University Press, Oxford, 1999.
15. N. van der Lijn, Consumer Markets and Welfare under Central Planning, Thesis Publishers, Amsterdam, 65-92.
16. G. Jones et al., Collins Dictionary of Environmental Science, Herper Collins Publishers, Glasgow, 1990
17. J. Broom, Why Economics needs Ethical Theory, in: K. Basu, R. Kanbur (Eds.), *Arguments for a Better World*, Oxford University Press, Oxford, 2008.